



A Citizen's Guide to Commenting on Air Permits for Oil and Natural Gas Facilities

Group Against Smog and Pollution
5135 Penn Avenue, Pittsburgh PA · (412) 924-0604
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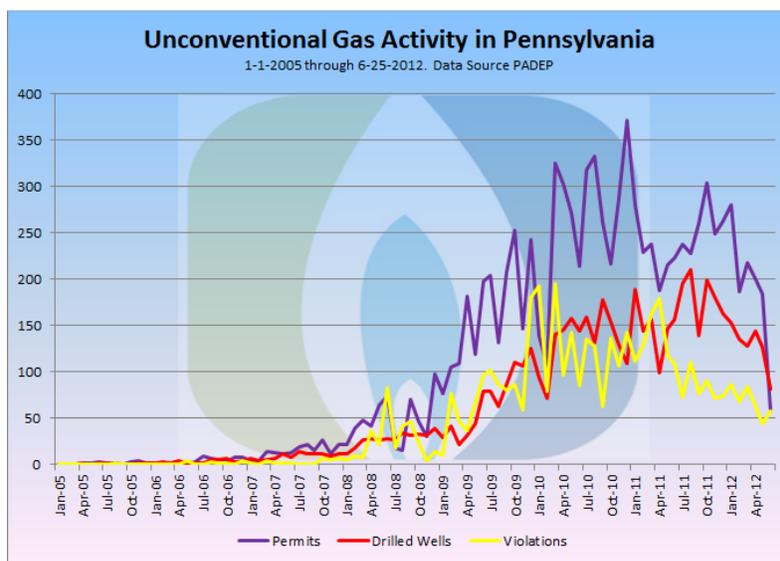
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Introduction

The rapid development of the Marcellus Shale natural gas play in Pennsylvania has raised many concerns about the impact the industry will have on the environment and the health of those living near natural gas facilities. The purpose of this handbook is to inform citizens about air pollution resulting from natural gas drilling and production, describe how these emissions are controlled through the permitting process, and explain how individuals can “comment” on these permits before they are finalized. Commenting gives individuals or organizations an opportunity to voice their concerns and helps to ensure that the final permit adequately controls emissions.

Much of the challenge of regulating air pollution from natural gas production must be attributed to the relatively wide geographic distribution of emission units in a typical Marcellus Shale operation. While traditional major air pollution sources such as steel mills or power plants are often made up of a few large buildings located on the same parcel of land, deep shale drilling operations are composed of dozens of relatively small sources—a well pad here, a storage tank there—hidden away in secluded fields and often separated from other components of the gas production operation by miles of pipeline.

The industry has generally grown very rapidly in recent years, although development has slowed somewhat in late 2011 and 2012 due to low gas prices. Natural gas operations have proved difficult to regulate, and because many of them are small and do not require air permits, we have incomplete information on the number of sources and their associated emissions.



Source: FracTracker, <http://www.fractracker.org/2012/06/unconventional-gas-activity-in-pennsylvania/>

Errors can and do occur during PADEP's permitting process. Getting it wrong often results in significantly greater air emissions. Giving individuals the tools necessary to review these permits and make a meaningful contribution to the process will greatly increase the likelihood that permits will properly limit emissions. The more eyes that critically review a proposed permit, the more likely it is that errors will be caught and corrected.

The following chapters will give you the information you need to begin commenting on air permits related to natural gas development in the Marcellus Shale. Chapter 1 will give a general description of the Marcellus Shale formation and natural gas extraction. Chapter 2 provides background information on various types of air pollutants, and particularly those associated with natural gas development. Chapter 3 explains the regulatory framework that applies to oil and gas production in Pennsylvania, and describes when an air permit is required. Finally, Chapter 4 explains how you can be involved in the permitting process by scheduling a file review, reviewing permitting documents, and drafting and submitting effective comments.

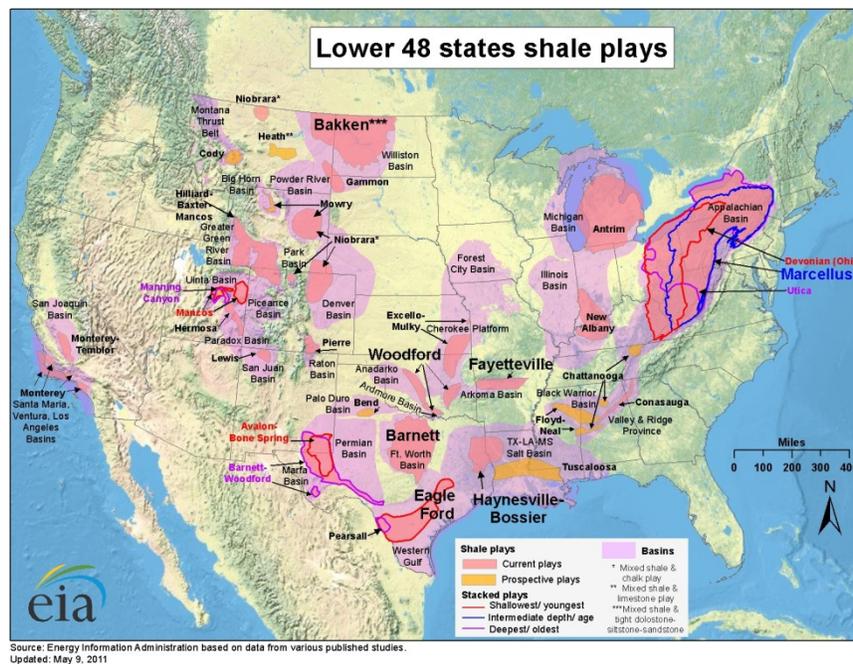
Keep in mind that the commenting process is generally the same whether you are commenting on a permit related to air quality, water quality, proposed new environmental regulations, or any sort of agency action that allows for a public comment. While this handbook is focused specifically on understanding and commenting on air permits for the natural gas industry, you can adapt this information and apply it in many other areas.

Chapter 1

Marcellus Shale and the Natural Gas Industry

The Marcellus Shale is a rock formation found between 5,000 and 8,000 feet below the surface, mainly in Pennsylvania, New York, and West Virginia.¹ The shale was formed over 350 million years ago in what was formerly a shallow inland sea, and now contains large quantities of natural gas found in small pores in the rock.² There was previously little interest in developing the Marcellus Shale because gas prices were low and the extraction technology was prohibitively expensive. However, technological developments and an increase in natural gas prices made production from deep shale formations profitable, causing the recent boom in natural gas drilling and production.³ Development of the Marcellus Shale began in earnest in Pennsylvania in 2008, and has increased dramatically since that time.

There are a number of shale formations in the United States that are similar to the Marcellus Shale. For example, the Barnett Shale in Texas has already been heavily developed.⁴ The Utica Shale is another formation that covers a similar geographical area to the Marcellus, but it is deeper and more expansive than the Marcellus Shale. It generally has not yet been developed, but will likely be developed in the near future.⁵

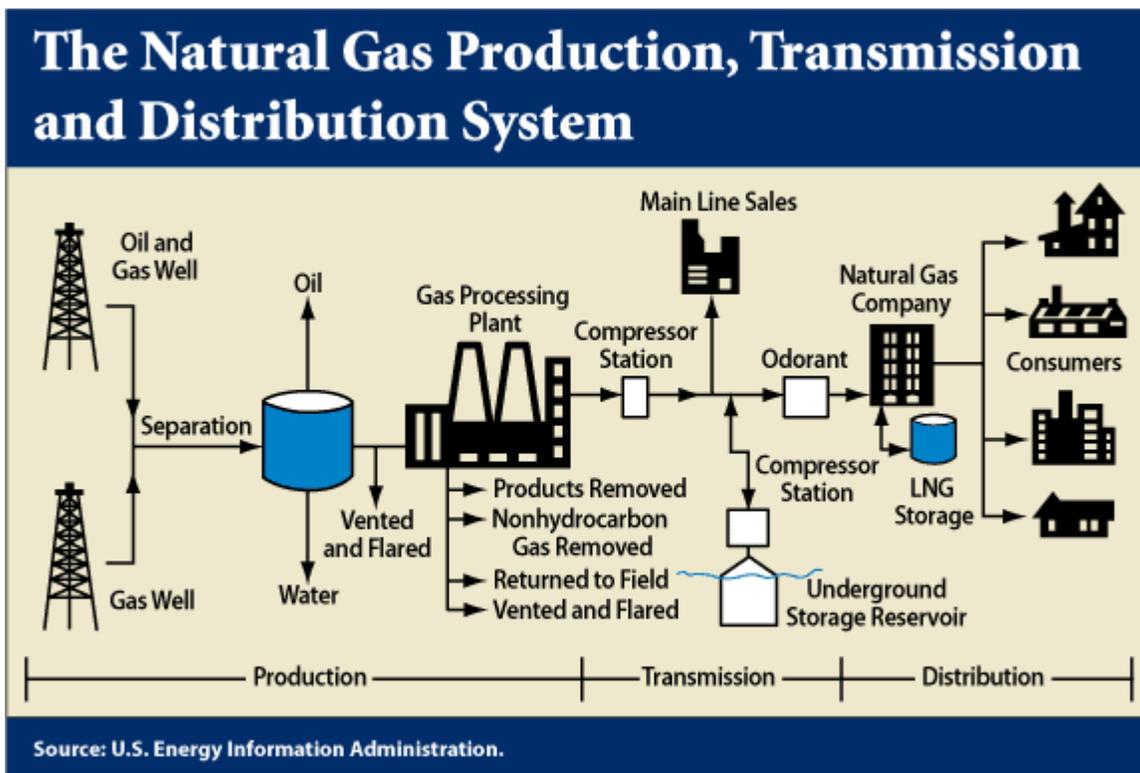


Source: <http://www.eia.gov/analysis/studies/usshalegas/>

Wells in the Marcellus Shale are drilled using horizontal drilling and hydraulic fracturing. First, a well is drilled vertically into the ground. The wellbore is then turned

and drilling continues horizontally into the Marcellus formation. Once drilling is complete, the well is cased in cement⁶ and then hydraulic fracturing, or “fracking,” is used to stimulate gas production. The operator pumps fluid, including large amounts of water, an assortment of chemicals, and a “proppant” such as sand, into the well under high pressure. This creates small cracks in the shale and allows the gas to escape into the wellbore.⁷ Multiple wells can be drilled in different directions from a single well pad, allowing the maximum amount of gas to be produced from a single location.

The raw natural gas produced at these wells is not the same as the natural gas that consumers use to heat their homes. While the final product mostly consists of methane, raw natural gas contains a mixture of hydrocarbons, as well as water and other materials.⁸ These must be separated out to create “pipeline quality” natural gas. This generally involves removing water, sulfur, and carbon dioxide, and separating out the other hydrocarbons known as “natural gas liquids.”⁹ The exact makeup of gas varies widely by location. In some areas the gas is more “dry,” while gas produced in other areas is “wet” and contains more liquids that must be removed. Once this process is complete, the natural gas is then compressed and enters a pipeline for distribution. This step usually happens at a processing plant or compressor station.



Natural gas drilling and production can affect the environment and local communities in a number of ways. Areas of concern include:

- Air Emissions – See Chapter 2 for a detailed discussion of air emissions from the natural gas industry.
- Water consumption – Hydraulic fracturing requires large quantities of water, which may stress local water resources.¹⁰
- Wastewater disposal – Produced water (or water that has been used in the hydraulic fracturing process) contains chemicals and other contaminants; there have been issues related to proper disposal methods for this fluid.¹¹
- Drinking water – Potential contamination of drinking water wells has been a highly publicized concern.¹²
- Land use – Land is affected as access roads, well pads, and pipelines are constructed.¹³
- Local infrastructure -- Heavy truck traffic takes a toll on local roads, particularly in rural areas.¹⁴
- Local communities – An influx of people and an increase in industrial processes can change the character of local communities.¹⁵

While these concerns are significant, an engaged group of citizens can help to ensure that the industry is fully regulated and that environmental harms are minimized as much as possible. By commenting on proposed permits and new regulations, speaking at public hearings, and being in touch with local policymakers, individuals can have a positive impact on the ultimate outcome of decisions that will affect our health and environment.

Chapter 2

Air Pollutants

In order to effectively comment on air permits for the oil and gas industry, you first need to understand the types of pollutants associated with the industry. This chapter will provide you with information on air pollutants in general, specific pollutants associated with the oil and gas industry, and how these pollutants can affect human health and the environment.

A. Scope of Emissions Associated with Natural Gas Production

While oil and gas operations may seem relatively small and spread out compared to a steel mill or coal-fired power plant, they can still have a significant impact on our air quality. The following examples illustrate how air emissions from the oil and gas industry can affect air quality:

- A 2009 Southern Methodist University study found that in the 5-county Dallas-Fort Worth metropolitan area, annual NO_x and VOC emissions from the oil and gas sector exceeded emissions from all motor vehicles in the same area.¹⁶
- A 2008 analysis by the Colorado Department of Public Health and the Environment concluded that NO_x and VOC emissions from Colorado's oil and gas operations exceeded vehicle emissions for the entire state.¹⁷
- In 2009, for the first time in the state's history, Wyoming failed to meet National Ambient Air Quality Standards (NAAQS) for ozone. The Wyoming Department of Environmental Quality determined that emissions from the state's growing oil and gas sector were the cause.¹⁸
- Based on U.S. EPA's *Inventory of U.S. Greenhouse Gases and Sinks: 1990-2009*, "oil and gas systems are the largest human-made source of methane emissions and account for 37 percent of methane emissions in the United States or 3.8 percent of the total greenhouse gas emissions in the United States."¹⁹

These examples demonstrate the importance of fully regulating and accurately permitting sources in the oil and gas industry. If left uncontrolled, emissions from this industry can lead to rapid deterioration of air quality, both locally and in downwind states.

B. General Information on Air Pollutants

1. Criteria Air Pollutants

The Federal Clean Air Act (CAA)²⁰ controls six common air pollutants that are harmful to human health and the environment by requiring the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS).²¹ The six “criteria pollutants” are:

- Sulfur dioxide (SO₂)
- Nitrogen oxides (NO_x)
- Carbon monoxide (CO)
- Particulates (PM_{2.5} and PM₁₀)
- Ozone (O₃)
- Lead (Pb)

Each pollutant has a primary standard and a secondary standard.²² The primary standard sets a limit sufficient to protect public health, including sensitive populations such as children and asthmatics. The secondary standard applies limits intended to protect the environment or prevent damage to property. For more information on NAAQS, visit <http://www.epa.gov/air/criteria.html>.

2. Hazardous Air Pollutants (HAPs)

The Federal Clean Air Act of 1970 and 1977 required EPA to regulate emissions of a list of hazardous air pollutants (HAPs) that could reasonably be expected to cause death or serious illness. Initially, EPA was to set these standards based on health considerations, but for many of these substances no safe level can be identified. The CAA Amendments of 1990 established a new approach to setting National Emissions Standards for Hazardous Air Pollutants (NESHAPs). EPA now sets standards establishing the Maximum Achievable Control Technology (MACT) for a particular industry sector.²³ These standards moved away from the risk-based approach of the 1970 law to primarily a “technology-based” approach, meaning that the standards are based on considerations of technologically feasible emission reductions, rather than reductions necessary to reach a health-based standard. MACT standards are based on emissions reductions achieved at the best-performing facilities that are similar to those subject to the regulation. These standards are intended to achieve maximum HAP emission reductions while also considering implementation costs, the effect on health and the environment, and energy requirements.²⁴ 187 hazardous air pollutants are covered by these regulations. For more information, see <http://www.epa.gov/ttn/atw/eparules.html>.

3. Monitoring

State and local air pollution control agencies are required to create and maintain an ambient air monitoring network for the criteria pollutants.²⁵ Individual monitor locations are determined based on federal monitor siting requirements. State and local air monitoring networks may also have additional monitors. Data from these monitors are used to determine whether the NAAQS are being met. For each criteria pollutant, areas that meet the standard are said to be in “attainment,” while those that do not are said to be in “non-attainment.” If in non-attainment, EPA requires state or local air pollution control agencies to create an “implementation plan” containing sufficient quantifiable, enforceable pollution reduction measures to bring the area into attainment.

- For more information on air monitor locations, visit the Pennsylvania Department of Environmental Protection at <http://www.dep.state.pa.us/dep/deputate/airwaste/aq/aqm/principal.htm>.
- Allegheny County has its own air program and additional monitoring locations. For more information, visit <http://www.achd.net/air/index/html>.

4. Air Quality Index

The Air Quality Index (AQI) provides a daily measure of air quality for many areas of the country. The AQI is color-coded to correlate pollution concentrations to the likelihood and severity of suffering negative health effects when exposed to air pollution at these levels. For instance, green means the air quality is good, and red means the air is unhealthy for everyone. EPA calculates the AQI for five major air pollutants – ground-level ozone, particulate matter, carbon monoxide, sulfur dioxide, and nitrogen dioxide.

- You can follow the AQI levels of criteria air pollutants in your area and across the country in real-time at <http://www.airnow.gov/>.
- Similar information for southwestern Pennsylvania is available at <http://www.dep.state.pa.us/dep/deputate/airwaste/ag/agm/psipitt.htm>.

C. Air Emissions from Natural Gas Operations²⁶

The process of natural gas drilling, extraction, and delivery may result in significant air pollution emissions. Below is a general discussion of air pollutants associated with natural gas extraction and the sources of those emissions in the oil and gas development process.

1. Methane (CH₄)

Methane gas may escape to the atmosphere at many points during gas production, processing, storage, and distribution. Methane is the primary component of natural gas, making up 70%-90% of its volume, and is colorless and odorless. The gas may leak from wellheads, equipment, and pipelines, or be vented directly to the atmosphere. If gas leaks or is vented before it is processed, it will contain a number of other gases in addition to methane. Other hydrocarbons including ethane, propane, and butane can account for up to 20% of the raw natural gas. These gases are valuable and are usually separated from the methane and sold. Some other gases that may be present in small quantities include carbon dioxide, oxygen, nitrogen, hydrogen sulfide, and trace amounts of other rare gases.²⁷

The primary concern related to methane emissions is that methane is a very potent greenhouse gas. Methane has a global warming potential at least 20 times more potent than carbon dioxide averaged over a 100-year period (carbon dioxide equivalent, or CO₂e), and even more potent over a shorter period. Additionally, methane can be explosive at a concentration of 5% to 15%.²⁸

2. Nitrogen Oxides (NO_x)

The sum of nitric oxide (NO) and nitrogen dioxide (NO₂) is typically called “nitrogen oxides,” or “NO_x.” Nitrogen oxides are products of fossil fuel combustion. They are generally emitted during flaring operations, in vehicle exhaust, and when fuel is burned to power generators or compressors. EPA measures NO₂ to approximate concentrations for the entire category of nitrogen oxides.

Short-term NO₂ exposure, ranging from 30 minutes to 24 hours, can cause airway inflammation in healthy people and increased symptoms in asthmatics. NO_x contributes to acid rain, particulate pollution, and ground level ozone formation. Ground level ozone (O₃) is a criteria pollutant that is formed when volatile organic compounds (VOCs) react with NO_x in the presence of sunlight in a complex photochemical reaction. By emitting “ozone precursors” such as NO_x and VOCs, natural gas production activities contribute to the formation of ozone in the atmosphere. Ozone may travel for considerable distances, causing unhealthy concentrations in rural as well as urban areas. Increased ozone levels are associated with respiratory symptoms such as wheezing, chest pain, coughing, and an increased risk of asthma attack. Repeated exposure may permanently damage lung tissue. Sensitive individuals should avoid exercising when outdoor ozone levels are high. Ozone can also interfere with some plants’ ability to produce and store food, creating susceptibility to disease and leading to reduced forest growth and crop yields.

3. Particulate Matter (PM₁₀, PM_{2.5})

Particulate matter from oil and gas sites typically is the result of diesel engine exhaust. At gas well sites, soil particles mixing in the air during well pad construction and road dust from truck traffic on access roads may be another significant source.

Particulate matter is composed of small solid or liquid airborne particles. The larger of these groups is referred to as PM₁₀ (particles less than or equal to 10 micrometers in diameter). The smaller particles are referred to as PM_{2.5} (particles less than or equal to 2.5 micrometers in diameter). The very small PM_{2.5} particles are able to penetrate more deeply into the body and pose serious health problems. Diesel emissions, for example, are largely composed of PM_{2.5} particles and even smaller “ultra-fine” particles.

Health effects associated with inhalation of these particles include respiratory problems, aggravated asthma, chronic bronchitis, heart attacks, and premature death. Studies have shown that “each 10- $\mu\text{g}/\text{m}^3$ elevation in fine particulate air pollution was associated with approximately a 4%, 6%, and 8% increased risk of all-cause, cardiopulmonary, and lung cancer mortality respectively.”²⁹ Particulate matter also contributes to regional haze.

4. Volatile Organic Compounds (VOCs)

Volatile organic compounds, or VOCs, may be emitted from a range of equipment at natural gas sites, including condensate tanks, dehydrators, venting and flaring of gas during stimulation, evaporation from containment pits, as engine exhaust, and as fugitive emissions.

The term “VOC” describes a broad category of chemicals. VOCs consist primarily of photochemically-reactive hydrocarbons with high vapor pressure and low-to-medium water solubility. VOCs pose health risks at very low concentrations. Benzene, for example, is a highly dangerous VOC that is a known carcinogen. Exposure may be by respiration, ingestion, or absorption through the skin.

VOCs are also ozone precursors, and contribute to the atmospheric formation of ozone. (See section C.2 above).

5. Sulfur Dioxide (SO₂)

Sulfur dioxide emissions may result from flaring of natural gas and combustion of fossil fuels containing sulfur. SO₂ is a colorless, nonflammable gas at room temperature with a pungent odor. Short-term exposure is associated with respiratory problems such as wheezing, chest tightness, and shortness of breath. SO₂ contributes to formation of atmospheric particle pollution as well as acid rain.

6. Carbon monoxide (CO)

Carbon monoxide is emitted from flares, compressors, vehicles, and other equipment at natural gas production sites. CO is a colorless, odorless, and tasteless flammable gas. It is produced by incomplete combustion of carbon-based fuels.

CO reduces the body's ability to carry oxygen. Headache and dizziness are symptoms of lower levels of exposure. Symptoms of carbon monoxide poisoning include headache, nausea, vomiting, dizziness, fatigue, and a feeling of weakness. At very high levels, death can occur in minutes. Outdoors, CO contributes to the formation of ozone. It is also a criteria pollutant that is regulated under the Clean Air Act.

7. Hydrogen Sulfide (H₂S)

Hydrogen sulfide may be released during venting, incomplete combustion of flared gas, or as fugitive emissions from equipment. Hydrogen sulfide gas occurs in some natural gas formations; fortunately, hydrogen sulfide generally has not been associated with gas in the Marcellus Shale formation. It is a colorless, highly flammable, and explosive gas. Oil or natural gas is referred to as "sour" if it contains high concentrations of hydrogen sulfide. Hydrogen sulfide is slightly heavier than air and can collect in enclosed or low-lying areas.

Hydrogen sulfide has a rotten egg odor at low concentrations. The ability to perceive this odor varies widely among individuals. Olfactory fatigue with loss of ability to smell H₂S can set in at chronic low level exposure and very quickly at higher levels. Inability to detect the H₂S odor can make this compound particularly dangerous. Inflammation and irritation of the eyes, cough, headache, and neurologic symptoms can occur at chronic low airborne concentration.³⁰ H₂S can be rapidly lethal if inhaled at very high concentrations.

Chapter 3

Air Quality Regulations in Pennsylvania

Air pollution sources throughout most of Pennsylvania are regulated by the Pennsylvania Department of Environmental Protection (DEP) Bureau of Air Quality.³¹ Generally, air pollution sources must obtain an air permit from the Bureau of Air Quality prior to constructing or installing an air pollution source, but not in all cases. This section will address air permitting concerns unique to natural gas extraction operations.

A. Determining if a Permit is Necessary

DEP does not require a permit for sources that the Department determines are “of minor significance.”³² This makes permitting natural gas extraction operations difficult because they often include many small sources at different sites. DEP might conclude that each individual piece of equipment is of minor significance even though the combined emissions from the sources can create substantial air quality problems.

The following points address DEP’s requirements for a “source of minor significance” and will aid in determining if a well operator violated the law by failing to obtain a required air permit.

1. DEP must include all appropriate related pollution-emitting activities and equipment in its permitting analysis.

One simple rule is that the more activities and equipment that are considered part of a single source, the more likely the source will be considered significant enough to be required to apply for an air permit. Combining multiple pollutant-emitting activities for consideration as a single source for air permitting purposes is referred to as “aggregation.” Aggregation is particularly important in the context of natural gas development because these projects are often made up of many small sources. Therefore, it is vital to ensure that DEP included and accounted for all related air pollution-emitting activities and equipment in its permitting analysis.

EPA has recently clarified the approach that permitting authorities like DEP should take when determining what pollutant emitting activities should be aggregated. Aggregation determinations must be made on a case-by-case basis considering the following factors:

**Three factor
test for
source
aggregation**

(1) Are the activities under the control of the same person (or persons under common control)?

(2) Are the activities located on one or more contiguous or adjacent properties?

(3) Do the activities belong to the same industrial grouping?

If all three factors are satisfied, then the sources should be aggregated and permitted as a single source.³³ If DEP failed to consider these factors, citizens can take action by providing DEP with information demonstrating the proximity, common ownership, or operational interdependency of the natural gas projects at issue. Examples of relevant information include:

- Evidence that a natural gas operator has an economic stake in another nearby natural gas operation;
- Gas or condensate extracted at a wellhead is transported for additional processing to another nearby site;
- Multiple well sites are connected to a single compressor station.

In October 2012, DEP issued a final version of its guidance document titled “Guidance for Performing Single Stationary Source Determinations for Oil and Gas Industries,” which describes how the Department decides whether these sources should be aggregated.³⁴ The guidance creates a presumption that if two sources within ¼ mile of each other satisfy the aggregation factors, they should be aggregated. If they are not within ¼ mile, DEP must consider on a case-by-case basis whether the sources are “contiguous or adjacent.” There are a number of questions about the validity of this policy and whether it complies with federal law. However, for commenting purposes, citizens should point out that DEP must still consider whether aggregation is necessary even if sources are not within ¼ mile, as required by federal law. Failing to do so may result in inaccurate permitting decisions and may constitute a failure to fully regulate emissions.

2. DEP maintains an Air Permit Exemption List of sources that are presumed to be exempt sources of minor significance.

DEP maintains a list of classes of sources that are generally considered of minor significance that are exempt from air permit requirements. Many of these classes include very specific criteria a source must meet in order to be entitled to an exemption.

Exempt sources are still required to meet a number of air pollution control requirements. For example, exempt sources:

- Shall not emit offensive odors perceptible beyond the boundary of the property where the source is located;³⁵
- Shall not create a public nuisance;³⁶
- Shall not create air pollution that threatens “public health, safety or welfare or which is or may be injurious to human, plant or animal life or to property or which unreasonably interferes with the comfortable enjoyment of life or property;”³⁷
- Must be maintained and operated “in a manner consistent with good operating and maintenance practices; and in accordance with practices based on the manufacturer’s specifications to the extent such practices have a material impact on the source’s emissions;”³⁸
- Must meet particulate matter, sulfur dioxide, and opacity emission limits for any stationary fuel burning equipment;³⁹
- Must maintain adequate records to demonstrate no permitting thresholds are exceeded;⁴⁰
- Must ensure storage tank pressure relief valves are in good working order and do not open at an unnecessarily low pressure;⁴¹ and
- Must comply with any applicable air emissions regulations under the federal Clean Air Act’s New Source Performance Standards (NSPS) and National Emissions Standards for Hazardous Air Pollutants (NESHAP).⁴²

Note that DEP proposed revisions to the permit exemption list in early 2010, but these revisions have not been finalized.⁴³

3. Operations exempted by DEP might be subject to Federal Clean Air Act requirements such as the NNSR or PSD programs, or may be required to obtain a Title V operating permit.

Even if the natural gas extraction operation falls within the list of exempted sources, the permit exemption will not apply if the natural gas project is subject to the federal Clean Air Act’s Nonattainment New Source Review (NNSR), Prevention of

Significant Deterioration (PSD), or Title V permit programs.⁴⁴ NNSR, PSD, and Title V applicability is determined based on how much pollution a source is capable of emitting (i.e. “potential to emit”). Permit applications are a good source of data on potential emissions. Of course, a natural gas project claiming to be exempt from air permitting requirements is unlikely to submit a permit application; in this case the potential emissions calculations from a permit application for similar equipment at a larger, non-exempt natural gas project can be used to estimate the potential emissions for the source of interest.

a. Prevention of Significant Deterioration Applicability

The PSD permit program applies in areas of the country that are designated as being either in attainment of ambient air quality standards or unclassifiable. Most natural gas sources will be subject to PSD requirements if they have the potential to produce at least 250 tons per year (TPY) of any single pollutant. For sulfur recovery plants, the threshold is 100 TPY. The pollutants most likely to exceed this threshold for natural gas projects are NO_x and VOCs.

b. Nonattainment New Source Review Applicability

The NNSR program applies in areas that are in nonattainment for ambient air quality standards. A natural gas source is likely to be subject to NNSR requirement if it:

- has the potential to emit at least 50 TPY of VOCs;
- has the potential to emit at least 100 TPY of NO_x; or
- is located in Bucks, Chester, Delaware, Montgomery or Philadelphia Counties and has the potential to emit at least 25 TPY of VOCs or NO_x.

c. Title V Permit Applicability:

A source must obtain a Title V operating permit if it has the potential to emit:

- 100 TPY or more of any single air pollutant;
- 50 TPY or more of VOCs;
- 25 TPY or more of VOCs or NO_x and is located in Bucks, Chester, Delaware, or Montgomery counties;
- 10 TPY or more of a single hazardous air pollutant (HAP);⁴⁵ or
- 25 TPY or more of any combination of HAPs.

Citizens can take action by informing DEP of any operations that might be exceeding any of these limits.

B. Types of Permits

Drilling operations not exempt from DEP's air permit requirements must obtain either a general permit or a plan approval prior to beginning construction or installation, followed by an operating permit when the source commences normal operations. These permitting activities are announced to the public in the *Pennsylvania Bulletin*.⁴⁶ These announcements are also sometimes published in the legal notice section of local newspapers.

1. General Permits

These permits are standardized documents intended to streamline the permitting process for sources that are similar in nature. DEP has identified 18 types of air pollution sources that are eligible for general permits. Natural gas projects seeking a general permit are most likely to apply for GP-5 – Natural Gas Production Facilities,⁴⁷ or GP-9 – Diesel or No.2 Fuel-Fired Internal Combustion Engines.⁴⁸ Note that DEP released a draft revised GP-5 in February of 2012, but this version has not yet been finalized.⁴⁹

Other important information about general permits:

- Sources subject to PSD or NNSR requirements cannot apply for general permits;
- General permits serve as both installation and operating permits;
- General permits must be renewed every 5 years;
- DEP does not provide a public comment period prior to issuing a general permit. Public notice is provided only after DEP has reached a decision to issue or deny a permit. Individuals who disagree with a general permit decision may appeal to the Pennsylvania Environmental Hearing Board.

2. Plan Approvals / Installation Permits

Natural gas projects that are not eligible for a general permit must obtain an installation permit (a/k/a "Plan Approval") prior to commencing construction of a proposed source.

The operator of a proposed air pollution source must submit an application to DEP to obtain a plan approval. The application is a public record. Citizens can obtain valuable information from reviewing a plan approval application. These applications must demonstrate that:

- The source will have the ability to monitor, record, and report its air emissions;
- The source will comply with all applicable air pollution regulations;
- The source's pollution emissions will be sufficiently low to satisfy DEP's "best available technology" (BAT) standard;
- The applicant has notified the county and municipality where the source would be located of their intention to construct the source; and
- The applicant must submit a compliance review form documenting any violations of air pollution regulations that have occurred at any of the applicant's Pennsylvania facilities in the past 5 years. If any of the applicant's facilities are currently in violation, the existing violation must be resolved before DEP will issue a plan approval.

If the proposed source exceeds the PSD threshold discussed above, it must also satisfy the PSD requirements. Before constructing or modifying such a source, the applicant must demonstrate that the source will not cause the area to exceed air quality standards and that air emissions will be minimized and controlled sufficiently to meet the "best available control technology" (BACT) standard. This standard is generally stricter than the state-only best available technology (BAT) standard.⁵⁰

If the proposed source exceeds the NNSR threshold discussed above, it must also satisfy the NNSR requirements. Before constructing or modifying such a source, the applicant must secure pollution reductions from existing sources in the area sufficient to offset the air emissions the new or modified source will produce. Further, the applicant must demonstrate that air emissions will be minimized and controlled sufficiently to meet the "lowest achievable emission rate" (LAER) standard. The LAER standard is even stricter than the BACT standard.⁵¹

After reviewing the application, DEP will create a draft permit. This permit should list or reference all air pollution limitations and standards contained in state or federal law that are applicable to the equipment, as well as any other permit "terms and conditions the Department deems necessary to assure the proper operation of the source."⁵² When the draft permit is complete, DEP will publish a public notice in the *Pennsylvania Bulletin* and the applicant must publish the notice in the legal notices section of a local newspaper. Once the notice is published, the public has 30 days to review the permit and submit written comments to DEP. The public notice will also include instructions for citizens to request a public hearing where oral testimony can be provided. For more information on commenting and requesting a public meeting, see Chapter 4. Individuals who disagree with DEP's ultimate permit decision can file an appeal to the Pennsylvania Environmental Hearing Board (EHB). For more information on the appeals process, see the "What Happens Next" section in Chapter 4.

If construction or installation of the project described in the permit does not commence within 18 months of DEP issuing a plan approval, or if there is an 18 month lapse in construction, the source must request and justify a permit extension or submit a new plan approval.⁵³

3. Operating Permits

Once a facility has commenced normal operations, it will be required to obtain an operating permit if it was required to obtain a plan approval, or if its emissions exceed the Title V or state-only operating permit threshold mentioned above. If a source must obtain a Title V permit, it does not have to obtain a state-only operating permit as well.

a. State-only operating permits

DEP requires sources whose actual emissions meet or exceed any of the pollutant emissions thresholds listed below to obtain state-only operating permits prior to commencing normal operations:

- 20 TPY of CO;
- 10 TPY of NO_x;
- 8 TPY of sulfur oxides (SO_x) or VOCs;
- 3 TPY of PM₁₀;
- 2.5 TPY of any combination of HAPs; or
- 1 TPY of any single HAP.

Other important information about operating permits:

- State-only operating permits must be renewed every five years.
- When DEP creates a draft operating permit, it will publish a public notice in the *Pennsylvania Bulletin* and the applicant must publish the notice in the legal notices section of a local newspaper. Once the notice is published, the public has 30 days to review the draft permit and submit written comments to DEP. The public notice will also include instructions for citizens to request a public hearing where oral testimony can be provided. Individuals who disagree with DEP's ultimate permit decision can file an appeal to the Pennsylvania Environmental Hearing Board. For more information on the appeals process, see the "What Happens Next" section in Chapter 4.

b. Title V Operating Permits

Title V operating permits are required by the Federal Clean Air Act. Title V requirements apply to large sources of emissions that have commenced normal operations. A source must obtain a Title V permit if it has the potential to emit:

- 100 TPY or more of any single air pollutant;
- 50 TPY or more of VOCs;
- 25 TPY or more of VOCs or NO_x and is located in Bucks, Chester, Delaware, or Montgomery counties;
- 25 TPY or more of any combination of HAPs; or
- 10 TPY or more of a single HAP.⁵⁴

Title V permits combine all air pollution control requirements applicable to a pollution emitting facility into a single, comprehensive document. Further, the Title V program establishes monitoring and reporting procedures a source must meet in order to demonstrate compliance with the Title V permit requirements.⁵⁵

When DEP creates a draft Title V operating permit, the Department will publish a public notice in the *Pennsylvania Bulletin* and the applicant must publish the notice in the legal notices section of a local newspaper. Once the notice is published, the public will have 30 days to review the draft permit and submit written comments to DEP. The public notice will also include instructions for citizens to request a public hearing where oral testimony can be provided.

Title V permits also must be approved by EPA. From the time DEP submits a proposed permit to EPA, EPA has 45 days to review it. If EPA rejects the permit, DEP must either deny the permit or revise the permit and resubmit it to EPA. If EPA does not reject the permit within the 45-day period, the permit becomes final. Citizens who submit comments on the permit have 60 days from the time EPA's 45 day review period ends to petition EPA to reconsider and reject the permit. If EPA refuses to reject the permit despite a citizen petition, citizens who submitted comments can challenge EPA's decision in federal court or appeal DEP's decision before the Pennsylvania Environmental Hearing Board. For more information on the appeals process, see the "What Happens Next" section in Chapter 4.

Chapter 4

Commenting and Public Participation

Government agencies are often required to use “notice-and-comment” procedures when taking particular actions, such as creating new regulations or approving a permit. This means that the agency provides notice to the public that it is proposing to take an action by publishing information about the proposal. This is followed by a public comment period, usually lasting 30 days, during which interested members of the public may submit written comments expressing any concerns about or suggested improvements to the proposed action. At the close of the comment period, the agency must then consider and respond to the comments it received, and may incorporate them into a final draft of the proposed action. This chapter will give you the information you need to effectively participate in this process.

A. The *Pennsylvania Bulletin*

The *Pennsylvania Bulletin* is a weekly publication that includes notices of agency actions, such as permitting decisions or changes in agency regulations. Current and previous issues of the Bulletin can be accessed online at www.pabulletin.com. The Bulletin is organized by agency; permits related to Marcellus Shale development and air quality will be found in the Department of Environmental Protection’s section. The Bulletin is published weekly on Saturdays. Notices may also be published in the legal notices section of a local newspaper.

The notice will give details concerning the facility including its location, equipment to be installed at the facility, expected emissions, and how to submit comments on the proposed permit. The public generally has 30 days from the date of publication to submit comments. The notice will explain what information must be included in the comments, and will provide contact information for a DEP staff member to whom you should submit the comments or that you can contact if you have any questions.

The *Pennsylvania Bulletin* website can sometimes be challenging to navigate for those who are unfamiliar with its layout. Follow these steps to view permits and other actions that are up for public comment.

Step 1: Access the Bulletin homepage at www.pabulletin.com.

- From here you can use the links on the left side of the page to:
 - View the “Current Issue” of the Bulletin; or
 - Use the “Search” link to see past Bulletins. Past Bulletins are sorted by year, or can be searched by text.

Step 2: Click on “Current Issue” on the left side of the page.

- This link takes you to a table of contents page for the current week’s Bulletin. The volume number and date will be listed at the top of the page.

Step 3: Scroll down the page to the “Executive Agencies” heading.

Step 4: Under “Executive Agencies,” scroll down to the sub-heading for the “Department of Environmental Protection.”

Step 5: Click on the link for “Applications, actions and special notices” under the DEP subheading.

- This is where you will find permitting notices.
- There may be other links under the DEP heading for other actions, including proposed regulatory changes; you may wish to explore these as well.

Step 6: Use the navigation bar located at the top and bottom of the page to view all sections of the Bulletin.

- Click “Next” or “Previous” to view pages within the edition of the Bulletin.
- Click “Bulletin TOC” to view the full Table of Contents for the edition of the Bulletin that you are viewing.
- Click “Next Bulletin” if you are viewing an old edition of the Bulletin and want to move on to the next week’s edition.
- Click “Search” to browse old Bulletin’s by date, or to search the Bulletin’s text.
- Click “Home” to return to the Bulletin’s home page.

Step 7: Click through the Bulletin to view the two sections with the “Air Quality” heading.

- Notices listed under “Air Quality” are grouped by region.
- Be sure to look through the entire Bulletin and view both sections related to Air Quality.
- You will also see many types of notices for a broad range of environmental issues. For example, you will likely see headings for actions being taken under the Clean Streams Law, Safe Drinking Water, Land Recycling and Environmental Remediation, and many others.

B. File Reviews

1. Types of File Reviews

DEP makes many types of records available for public review upon request. File reviews can be formal or informal. Informal file reviews are usually the quickest and easiest way to obtain documents. This involves contacting the regional DEP office that is processing the permit and specifying the files you wish to review. DEP will then schedule an appointment at which the documents will be available for you to review or copy. A copier is available in the file review room, and you will be charged per page copied. If you have a laptop and portable scanner, you can also bring these to your file review and scan the documents free of charge. The *Bulletin* notice will tell you which regional DEP office you will need to contact in order to schedule a file review for a particular permit. A list of all of DEP's regional offices can be found on the DEP website (click on the "About DEP" link, and then the "Office Locations" link).⁵⁶

If you are unable to obtain the records by requesting an informal file review, you can formally request the documents by submitting a request under the Pennsylvania Right-to-Know Law.⁵⁷ The Right-to-Know Law generally provides for open access to public records; all records are presumed to be public and must be made accessible to the public unless specifically exempted from disclosure.⁵⁸ Only *records* can be requested under the law; you cannot submit a request simply asking questions of the agency. Keep in mind that if your request is granted, you will be required to pay the cost of postage and copying, which may be up to 25 cents per page. This method of requesting documents should be a last resort; the process can be quite time consuming and often frustrating, so you should try to obtain the documents informally if at all possible.

For more information, visit the Pennsylvania Office of Open Records at <http://openrecords.state.pa.us>. Also see OOR's *Citizen Guide to the Right-to-Know Law*, found at <https://www.dced.state.pa.us/public/oor/CitizensGuideFull082011.pdf>.

You can also access some information on DEP's website. DEP maintains the eFacts and eNotice databases. eFacts provides a searchable database and map of permitted facilities, their locations, and other details associated with permitting and compliance. eFacts can be accessed at <http://www.dep.state.pa.us/dep/efacts/>. eNotice allows users to sign up for email notice of permitting actions, and can be accessed at <http://www.ahs2.dep.state.pa.us/eNOTICEWeb/>.

2. Scheduling

DEP schedules file reviews between 9:00am and 4:00pm Monday through Friday. Appointments are made on a first-come, first-served basis. It is important to keep in mind that you will have 30 days to make comments, but you may have to wait 2-3 weeks until your scheduled file review. Don't delay in scheduling your file review, and be sure to notify DEP when scheduling that you need to complete your file review before the comment period closes.

C. Requesting a Public Hearing

In addition to commenting on proposed Plan Approvals or Operating Permits, individuals can also request that a public hearing be held concerning the proposed action. If this request is granted, notice of the hearing will also be published in the *Pennsylvania Bulletin* at least 30 days before the hearing is held. This provides an opportunity for members of the community to voice their concerns to DEP in person.

D. Writing Effective Comments

1. Writing Comments

Comments are intended give the public an opportunity to participate, share their concerns, and provide input that will help lead to a better outcome. When drafting comments, you want to make sure that your statements are clearly communicated and useful to the decision-maker when revising the proposed action. Here are some tips on how to write comments that will be effective:

- Write your comments in letter form
- State who you are and why you are interested in the action
- Review the documents you are commenting on thoroughly beforehand, so that your comments are accurate and make sense in context
- Break your comment into subheadings or sections to make it easy to read.
- For each topic you discuss, try beginning that section with one sentence, in bold type, that sums up your point for that section. The rest of the text should support this clear, concise statement.

- Stay focused on the topic; only discuss issues relevant to the specific decision being made.
- Think about who will be reading your comment. It will likely be a staff person who has to read many similar comments, and who has to read them quickly. Make it easy for them to pay attention to your comments and remember your main points.
- Be polite. Even if you are upset about the proposed action, your comments will be better received if they are respectful.
- Point out positive aspects of the proposed action that should not be changed.
- Point out anything in the proposal that does not comply with the law.
- Be specific and concise.
- Support your arguments. Do some research and cite to authorities where necessary.
- Propose alternative solutions when possible.
- Get someone else to review your comments before you submit them. This can help catch typographical errors, and make sure you have clearly communicated your message.

2. Submitting Comments

The notice in the *Pennsylvania Bulletin* will give instructions on how to submit your comments and what must be included in the comments. Generally, your comments must include your name and contact information, information on the proposed action or facility you are commenting on (such as a Plan Approval number), and your reasons for objecting to the permit. The notice will also include the name, address, and phone number for a DEP staff person to whom you should address and mail your comments. When you mail your comments, make sure they are postmarked before the end of the 30 day comment period; also consider mailing your comments with delivery confirmation so you have proof that your comments were received. It may also be possible to contact DEP and ask if you can submit your comments via fax or email if you wish.

E. What Happens Next

After the public comment period has ended, the agency will review the comments it received and may make changes to the proposed action based on those comments. Once a final decision is made, the agency will usually notify commenters by mailing them a copy of the action. This will also include a comment response document, in which the agency responds to issues raised in the comments, and explains why the comment did or did not result in a change to the final action.

If you are not satisfied with the final action, you can file an appeal with the Pennsylvania Environmental Hearing Board (EHB).⁵⁹ The EHB operates like a court, and hears appeals from those who are challenging DEP actions.⁶⁰ A notice of appeal must be filed within 30 days of receiving notice of DEP's action. Because this is a relatively short period of time, consider speaking to legal counsel as soon as possible if you anticipate appealing DEP's final action.

References

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- ¹ Pa. Dept. of Env'tl Prot., *Marcellus Shale Fact Sheet*, at 1, available at <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-85899/0100-FS-DEP4217.pdf>.
- ² Daniel J. Soeder and William M. Kappel, USGS, *Water Resources and Natural Gas Production from the Marcellus Shale*, May 2009, at 1, available at <http://pubs.usgs.gov/fs/2009/3032/pdf/FS2009-3032.pdf>.
- ³ *Id.*
- ⁴ See, e.g., Railroad Commission of Texas, *Barnett Shale Information*, <http://www.rrc.state.tx.us/barnettshale> (last updated Oct. 9, 2012); Al Armendariz, *Emissions from Natural Gas Production in the Barnett Shale Area and Opportunities for Cost Effective Improvements*, Sept. 30, 2008, available at http://www.fortworthgov.org/uploadedFiles/Gas_Wells/Emissions%20report%20for%20barnett-shale%2010-14-08.pdf.
- ⁵ *Utica Shale – The Natural Gas Giant Below the Marcellus?* <http://geology.com/articles/utica-shale/>.
- ⁶ For more information on well casing and cementing, see Pennsylvania's regulatory requirements at 25 Pa. Code §§ 78.81 through 78.87.
- ⁷ N.Y. Dept. of Env'tl Conservation, *Draft SGEIS*, Ch.5, at 5-32, Sept. 30, 2009, available at http://www.dec.ny.gov/docs/materials_minerals_pdf/ogdsgeischap5.pdf.
- ⁸ *Processing Natural Gas*, http://www.naturalgas.org/naturalgas/processing_ng.asp.
- ⁹ *Id.*
- ¹⁰ See, e.g., Susquehanna River Basin Commission, *Accommodating a New Straw in the Water: Extracting Natural Gas from the Marcellus Shale in the Susquehanna River Basin* (Feb. 2009), available at [http://www.srbcc.net/programs/docs/Marcellus%20Legal%20Overview%20Paper%20\(Beauduy\).pdf.PDF](http://www.srbcc.net/programs/docs/Marcellus%20Legal%20Overview%20Paper%20(Beauduy).pdf.PDF) (stating that "Marcellus shale gas well development activity generally requires the use of considerable quantities of water, particularly for hydraulic fracturing, which can range from

hundreds of thousands of gallons for vertical well fracture treatment, to millions of gallons for horizontal well fracture treatment,” (at 3) and describing methods used by SRBC to manage water consumption to prevent adverse impacts.).

¹¹ Soeder and Kappel, *supra* note 2, at 4-5.

¹² See, e.g., U.S. EPA, *Draft Report – Investigation of Ground Water Contamination near Pavilion, Wyoming* (Dec. 2011), available at http://www.epa.gov/region8/superfund/wy/pavillion/EPA_ReportOnPavillion_Dec-8-2011.pdf (stating that “the data indicates likely impact to ground water that can be explained by hydraulic fracturing.” (at xiii)).

¹³ See, e.g., Karl Blankenship, *Marcellus Shale Drilling May Take Huge Chunks Out of PA Forests*, CHESAPEAKE BAY JOURNAL (Dec. 2011), available at http://www.bayjournal.com/article/marcellus_shale_drilling_may_take_huge_chunks_out_of_pa_forests (estimating that “38,000-90,000 acres of forest may ultimately be cleared for wells seeking to tap the Marcellus Shale formation . . . [a]nother 60,000-150,000 acres of forest could be lost for new pipelines.”).

¹⁴ See, e.g., Jon Schmitz, *Marcellus Shale Industry Obligated to Repair State Roads*, PITTSBURGH POST-GAZETTE (Mar. 30, 2012), available at <http://www.post-gazette.com/stories/local/marcellusshale/marcellus-shale-industry-obliged-to-repair-state-roads-303092/>.

¹⁵ See, e.g., Kathryn J. Brasier et al., *Residents’ Perceptions of Community and Environmental Impacts from Development of Natural Gas in the Marcellus Shale: A Comparison of Pennsylvania and New York Cases*, 26 J. RURAL SOC. SCI. 1, 32-61 (2011).

¹⁶ Armendariz, *supra* note 4.

¹⁷ Colorado Dept. of Public Health & Environment, Air Pollution Control Division, Oil and Gas Emission Sources Presentation for the Air Quality Control Commission Retreat (May 15, 2008), at 3-4.

¹⁸ WYDEQ, Technical Support Document I for Recommended 8-Hour Ozone Designation for the Upper Green River Basin, WY, at viii (Mar. 26, 2009), available at http://deq.state.wy.us/out/downloads/Ozone%20TSD_final_rev%203-30-09_jl.pdf.

¹⁹ U.S. EPA Natural Gas Star Program, *Major Methane Emission Sources and Opportunities to Reduce Methane Emissions*, <http://www.epa.gov/gasstar/basic-information/index.html#sources> (last visited Oct. 11, 2012); see also U.S. EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010* (Apr. 15, 2012), available at <http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2012-Main-Text.pdf>, for EPA’s most recent annual inventory report.

²⁰ 42 U.S.C. §§ 7401 *et seq.* (2006).

²¹ 42 U.S.C. § 7409 (2006).

²² See 40 C.F.R. Part 50.

²³ 40 C.F.R. Part 61.

²⁴ 42 U.S.C. § 7412(d).

²⁵ 40 C.F.R. Part 58.

²⁶ Information for the emission sources at the oil and gas extraction site for the pollutants discussed above in section Air Emissions in Natural Gas Operations are taken from Earthworks: Air Contaminants, available at <http://www.earthworksaction.org/aircontaminants.cfm>; and Oil and Gas Air Pollution available at <http://www.earthworksaction.org/oilgasairpollution.cfm> and Oil and Gas Pollution available at <http://www.earthworksaction.org/pubs/Oilandgaspollution.pdf>.

²⁷ Natural Gas Supply Association, *Background*, <http://www.naturalgas.org/overview/background.asp>.

²⁸ The Engineering Toolbox, *Gases-Explosive and Flammability Concentration Limits*, available at http://www.engineeringtoolbox.com/explosive-concentration-limits-d_423.html.

²⁹ C. Arden Pope III, Richard T. Burnett, and Michael J. Thun; et al, *Lung Cancer, Cardiopulmonary Mortality, and Longterm Exposure*, JAMA. 2002; 287(9):1132-1141 (doi:10.1001/jama.287.9.1132, available at <http://jama.jamanetwork.com/article.aspx?articleid=194704>.

³⁰ Material Safety Data Sheet, Hydrogen Sulfide, http://avogadro.chem.iastate.edu/MSDS/hydrogen_sulfide.pdf.

³¹ Allegheny and Philadelphia County each operate their own air programs separate from DEP. This handbook focuses on the DEP processes. While air permitting procedures in Allegheny and Philadelphia County are generally similar to those described here, there are important differences. Be sure to always reference the policies and procedures these counties employ.

³² 25 Pa. Code § 127.14(a)(8).

³³ Memo from Gina McCarthy, EPA Assistant Administrator, to EPA Regional Administrators, *Withdrawal of Source Determinations for Oil and Gas Industries* (Sept. 22, 2009), available at <http://www.epa.gov/Region7/air/nsr/nsrmemos/oilgaswithdrawal.pdf>. Natural gas exploration, drilling, production, and processing operations all belong to the Standard Industrial Classification System (SIC) industrial group 13: Oil and Gas Extraction, see http://www.osha.gov/pls/imis/sic_manual.display?id=8&tab=group.

³⁴ Pa. Dep't of Env'tl. Prot., DEP ID: 270-0810-006, *Guidance for Performing Single Stationary Source Determinations for Oil and Gas Industries* (Oct. 6, 2012), available at [http://files.dep.state.pa.us/Air/AirQuality/AQPortalFiles/Final_Guidance_for_Performing_Single_Stationary_Source_Determinations_for_OG_Industries100612_\(2\).pdf](http://files.dep.state.pa.us/Air/AirQuality/AQPortalFiles/Final_Guidance_for_Performing_Single_Stationary_Source_Determinations_for_OG_Industries100612_(2).pdf).

³⁵ 25 Pa. Code § 123.31.

³⁶ 35 P.S. § 4008

³⁷ 25 Pa. Code §§ 121.7, 121.1.

³⁸ Pa. Dep't of Env'tl. Prot., DEP ID: 275-2101-003, Air Quality Permit Exemptions, p. 10, available at <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-80104/275-2101-003.pdf>.

³⁹ 25 Pa. Code §§ 123.11, 123.22, 123.41.

⁴⁰ Pa. Dep't of Env'tl. Prot., DEP ID: 275-2101-003, Air Quality Permit Exemptions, p. 8, available at <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-80104/275-2101-003.pdf>.

⁴¹ 25 Pa. Code § 129.57.

⁴² Pa. Dep't of Env'tl. Prot., DEP ID: 275-2101-003, Air Quality Permit Exemptions, p. 8, available at <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-80104/275-2101-003.pdf>. Potentially applicable NSPS and NESHAP standards include the NSPS Equipment Leaks of VOC from Onshore Natural Gas Processing Plants, 40 CFR part 60, subpart KKK; the NSPS for Onshore Natural Gas Processing: SO₂ Emissions, 40 CFR part 60, subpart LLL; the NESHAP for Oil and Natural Gas Production Facilities, 40 CFR part 63, subpart HH; and the NESHAP for Natural Gas Transmission and Storage Facilities, 40 CFR part 63, subpart HHH.

⁴³ Pa. Dep't of Env'tl. Prot., DEP ID: 275-2101-003, Air Quality Permit Exemptions, DRAFT April 16, 2010, available at <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-80137/275-2101-003.pdf>.

⁴⁴ Pa. Dep't of Env'tl. Prot., DEP ID: 275-2101-003, Air Quality Permit Exemptions, p. 8, available at <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-80104/275-2101-003.pdf>.

⁴⁵ Hazardous Air Pollutants are toxic or carcinogenic compounds regulated by EPA under § 112 of the Clean Air Act. For a list of these compounds, see: <http://www.epa.gov/ttn/atw/orig189.html>. Note that, unlike other air pollutants, the federal Clean Air Act prohibits aggregation of hazardous air pollutant emissions from natural gas exploration and production equipment, 42 U.S.C. § 7412(n)(4).

⁴⁶ Available online at <http://www.pabulletin.com>.

⁴⁷ Pa. Dep't of Env'tl. Prot., GP-05, Natural Gas Compression Facilities, *available at* <http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-9747>. Note that DEP proposed revisions to GP-5 on March 3, 2012; see 42 Pa.B. 1187 (Mar. 3, 2012).

⁴⁸ Pa. Dep't of Env'tl. Prot., GP-09, Diesel or No. 2 Fuel-Fired Internal Combustion Engine(s), *available at* <http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-9752>.

⁴⁹ Pa. Dep't of Env'tl. Prot., *Proposed Substantive Amendments, General Plan Approval and/or General Operating Permit BAQ-GPA/GP-5, natural Gas Production and/or Processing Facilities* (Feb. 10, 2012), *available at* [http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-87177/GP-5%20Substantive%20Revisions%20%202-10-2012%20final%20version%20\(2\).pdf](http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-87177/GP-5%20Substantive%20Revisions%20%202-10-2012%20final%20version%20(2).pdf).

⁵⁰ For more information on the PSD program, see <http://www.epa.gov/nsr/psd.html>.

⁵¹ For more information on the NNSR program, see <http://www.epa.gov/NSR/>.

⁵² 25 Pa. Code § 127.12b(a).

⁵³ 25 Pa. Code § 127.13(b).

⁵⁴ Hazardous Air Pollutants are toxic or carcinogenic compounds regulated by EPA under § 112 of the Clean Air Act. For a list of these compounds, see: <http://www.epa.gov/ttn/atw/orig189.html>. Note that, unlike other air pollutants, the federal Clean Air Act prohibits aggregation of hazardous air pollutant emissions from natural gas exploration and production equipment, 42 U.S.C. § 7412(n)(4).

⁵⁵ For more information on the Title V program, see <http://www.epa.gov/air/oaqps/permits/>.

⁵⁶ Pa. Dep't of Env'tl. Prot., *About DEP – Office Locations*, http://www.portal.state.pa.us/portal/server.pt/community/about_dep/13464/office_locations/585263.

⁵⁷ 65 P.S. §§ 67.101 *et seq.*

⁵⁸ See PA Office of Open Records, *Citizen Guide*, Aug. 2011, *available at* <https://www.dced.state.pa.us/public/oor/CitizensGuideFull082011.pdf>.

⁵⁹ EHB Website <http://ehb.courtapps.com/public/index.php>.

⁶⁰ History of the Environmental Hearing Board, http://ehb.courtapps.com/content/ehb_history.php.