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| Regulatory Analysis Form (Completed by Promulgating Agency) | | INDEPENDENT REGULATORY REVIEW COMMISSION | |
| (All Comments submitted on this regulation will appear on IRRC's website) | | | |
| (1) Agency Environmental Protection | | IRRC Number: | |
| (2) Agency Number: 7 Identification Number: 544 | | | |
| (3) PA Code Cite: | | 25 Pa. Code Chapters 121 and 129 | |
| (4) Short Title: | | Control of VOC Emissions from Oil and Natural Gas Sources | |
| (5) Agency Contacts (List Telephone Number and Email Address): Primary Contact: Laura Edinger, 783-8727, ledinger@pa.gov Secondary Contact: Jessica Shirley, 783-8727, jessshirley@pa.gov | | | |
| (6) Type of Rulemaking (check applicable box): <input checked="" type="checkbox"/> Proposed Regulation <input type="checkbox"/> Final Regulation <input type="checkbox"/> Final Omitted Regulation | | <input type="checkbox"/> Emergency Certification Regulation; <input type="checkbox"/> Certification by the Governor <input type="checkbox"/> Certification by the Attorney General | |
| (7) Briefly explain the regulation in clear and nontechnical language. (100 words or less) <p>This proposed rulemaking would add reasonably available control technology (RACT) requirements and RACT emission limitations for oil and natural gas sources of volatile organic compound (VOC) emissions to Chapters 121 (relating to general provisions) and 129 (relating to standards for sources). VOCs are precursors to the formation of ground-level ozone, a public health and welfare hazard. Sources affected by this proposal include storage vessels in all segments except natural gas distribution, natural gas-driven pneumatic controllers, natural gas-driven diaphragm pumps, reciprocating compressors, centrifugal compressors, and fugitive emissions components. While this proposed rulemaking requires VOC emission reductions, methane emissions are also reduced as a co-benefit, because both VOCs and methane are emitted from oil and gas operations. This proposed rulemaking will provide consistency among all oil and natural gas sources in this Commonwealth for monitoring fugitive emissions.</p> <p>This proposed rulemaking will be submitted to the United States Environmental Protection Agency (EPA) for approval as a revision to the Commonwealth's State Implementation Plan (SIP) following promulgation of the final-form rulemaking.</p> | | | |
| (8) State the statutory authority for the regulation. Include <u>specific</u> statutory citation. <p>This proposed rulemaking is authorized under section 5(a)(1) of the Air Pollution Control Act (APCA) (35 P.S. § 4005(a)(1)), which grants the Board the authority to adopt rules and regulations for the prevention, control, reduction and abatement of air pollution in this Commonwealth. Section 5(a)(8) of the APCA (35 P.S. § 4005(a)(8)) also grants the Board the authority to adopt rules and regulations designed to implement the provisions of the Clean Air Act (CAA) (42 U.S.C.A. §§ 7401—7671q).</p> | | | |

(9) Is the regulation mandated by any federal or state law or court order, or federal regulation? Are there any relevant state or federal court decisions? If yes, cite the specific law, case or regulation as well as any deadlines for action.

In accordance with sections 172(c)(1), 182(b)(2)(A) and 184(b)(1)(B) of the CAA (42 U.S.C.A. §§ 7502(c)(1), 7511a(b)(2)(A) and 7511c(b)(1)(B)), this proposed rulemaking establishes the VOC emission limitations and other requirements of the EPA's recommendations in the Control Techniques Guidelines for the Oil and Natural Gas Industry, EPA 453/B-16-001, Office of Air Quality Planning and Standards, EPA, October 2016 (2016 O&G CTG) as RACT for these sources in this Commonwealth. See 81 FR 74798 (October 27, 2016). The EPA defines RACT as "the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility." See 44 FR 53761 (September 17, 1979).

The Department reviewed the RACT recommendations included in the 2016 O&G CTG for their applicability to the ground-level ozone reduction measures necessary for this Commonwealth and determined that the VOC emission reduction measures and other requirements are appropriate for this source category; however, the Department determined in two cases that more stringent RACT requirements are necessary. In the first, the Department determined that a lower VOC applicability threshold is necessary for storage vessels at unconventional well sites installed on or after August 10, 2013 (the effective date of the Department's Air Quality Permit Exemptions, Category 38 (Exemption 38), which established the 2.7 tons per year (TPY) VOC threshold for storage vessels at unconventional well sites) to prevent backsliding and that the lower applicability threshold also represents RACT for storage vessels at gathering and boosting stations, processing plants, and transmission stations. In the second, the Department determined that owners or operators must conduct monthly audio, visual, olfactory (AVO) inspections and quarterly leak detection and repair (LDAR) inspections of fugitive emissions components at their facilities.

Under section 108 of the CAA (42 U.S.C.A. § 7408), the EPA is responsible for establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants considered harmful to public health and the environment: ground-level ozone; particulate matter; nitrogen oxides (NO_x); carbon monoxide; sulfur dioxide; and lead. Section 109 of the CAA (42 U.S.C.A. § 7409) established two types of NAAQS: primary standards, which are limits set to protect public health; and secondary standards, which are limits set to protect public welfare and the environment. In section 302(h) of the CAA (42 U.S.C.A. § 7602(h)), effects on welfare are defined to include protection against visibility impairment and from damage to animals, crops, vegetation and buildings.

Section 110(a) of the CAA (42 U.S.C.A. § 7410(a)) provides that each state shall adopt and submit to the EPA a plan to implement measures (a SIP) to enforce the NAAQS or a revision to the NAAQS promulgated under section 109(b) of the CAA. A SIP includes the regulatory programs, actions, and commitments a state will carry out to implement its responsibilities under the CAA. Once approved by the EPA, a SIP is legally enforceable under both federal and state law. Section 172(c)(1) of the CAA provides that SIPs for nonattainment areas must include "reasonably available control measures," including RACT, for sources of emissions of VOCs and NO_x. Section 182(b)(2) of the CAA provides that for moderate ozone nonattainment areas, states must revise their SIPs to include RACT for sources of VOC emissions covered by control techniques guidelines (CTG) documents issued by the EPA prior to the area's date of attainment of the applicable ozone NAAQS. Section 184(a) of the CAA (42 U.S.C.A. § 7511c(a)) established a single Ozone Transport Region (OTR) comprised of the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont and the Consolidated Metropolitan Statistical Area that includes

the District of Columbia. More importantly, section 184(b)(1)(B) of the CAA requires states in the OTR, including this Commonwealth, submit a SIP revision requiring implementation of RACT for all sources of VOC emissions in the state covered by a specific CTG and not just for those sources located in designated nonattainment areas of the state.

Consequently, the Commonwealth's SIP must include regulations applicable statewide to control VOC emissions from oil and natural gas sources that are not regulated elsewhere in Chapter 129. This proposed rulemaking should achieve VOC emission reductions and lowered concentrations of ground-level ozone locally as well as in downwind states. Adoption of VOC emission reduction requirements is part of the Commonwealth's strategy, in concert with other OTR jurisdictions, to further reduce the transport of VOC ozone precursors and ground-level ozone throughout the OTR to attain and maintain the 8-hour ozone NAAQS. This proposed rulemaking will be submitted to the EPA for approval as a revision to the Commonwealth's SIP following promulgation of the final-form rulemaking.

The EPA issues guidance, in the form of a CTG, in place of regulations where the guidelines will be "substantially as effective as regulations" in reducing VOC emissions from a product or source category in ozone nonattainment areas. On October 27, 2016, the EPA issued the 2016 O&G CTG for emissions of VOCs from existing sources. See 81 FR 74798. The 2016 O&G CTG provides states with the EPA's recommendation of what constitutes RACT for the covered category. States can use the federal recommendations provided in the 2016 O&G CTG to inform their own determination as to what constitutes RACT for VOC emissions from the covered category. State air pollution control agencies may implement other technically-sound approaches that are consistent with the CAA requirements and the EPA's implementing regulations or guidelines.

Following promulgation of the "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources," published on June 3, 2016 (2016 NSPS), the EPA received petitions for reconsideration of several provisions of the 2016 NSPS. See 81 FR 35823 (June 3, 2016). On June 5, 2017, the EPA granted the reconsideration regarding fugitive emissions requirements, well site pneumatic pump standards, and professional engineer certification requirements for closed vent systems. See 82 FR 25730 (June 5, 2017).

On March 9, 2018, the EPA published a "Notice of Proposed Withdrawal of the Control Techniques Guidelines for the Oil and Gas Industry." See 83 FR 10478. In the notice, the EPA stated, "in light of the fact that we are reconsidering the 2016 NSPS and because the 2016 NSPS and CTG share certain key pieces of data and information, the EPA believes it is prudent to withdraw the CTG in its entirety." *Id.* at 10479. Even though the EPA has proposed this withdrawal, the Department decided that it is prudent to move ahead with this proposed rulemaking, using the CTG as a template. On April 23, 2018, the Department submitted comments against the proposed comprehensive withdrawal of the 2016 O&G CTG.

On October 15, 2018, the EPA proposed reconsideration amendments to the 2016 NSPS. See 83 FR 52056 (October 15, 2018). The proposed amendments include: changing the frequency of monitoring for fugitive emissions to annually at well sites, biennially at low-production well sites, and either annually or semi-annually at compressor stations; recognizing existing fugitive emissions monitoring and repair plans from certain states, including this Commonwealth, as an approved alternative means of emissions limitation (AMEL) to comply with the federal requirements; removing the differentiation of "greenfield" and "non-greenfield" sites and the ability to rule out routing pump emissions due to technical infeasibility; and relaxing the certification requirement for a professionally licensed engineer by allowing in-house engineers with appropriate expertise to also make the required certification.

On December 17, 2018, the Department submitted a comment letter on the EPA's proposed reconsideration amendments to the 2016 NSPS that recommended not reducing the LDAR inspection frequency for well sites and compressor stations; not allowing a step-down provision for LDAR at well sites as it is not appropriate to reduce semi-annual inspection frequencies; requiring that LDAR frequency be based upon the economic feasibility and not the production of a well; recognizing the Department's Exemption 38(c) of the Air Quality Permit Exemptions as AMEL; and not requiring owners and operators to notify the Administrator of their use of an AMEL as it will be self-evident in their annual report. In the EPA's 1995 Protocol for Equipment Leak Emission Estimates, the emission factors do not factor in production or line pressure and the EPA stated it is unable to account for lower operational pressures or pressure changes in the model plants used to determine the cost effectiveness for LDAR in the NSPS. The Department also referenced its LDAR program, in effect since February 2, 2013, which requires monthly AVO and quarterly LDAR at these facilities. Since the Department's LDAR requirements are recognized by the EPA as AMEL for the 2016 NSPS, and this proposed rulemaking implements RACT requirements which are more stringent than the recommendations in the 2016 O&G CTG, any changes finalized by EPA's reconsideration of the 2016 NSPS will not affect this proposed rulemaking.

The Department concurred with the EPA's proposal in the 2016 NSPS reconsideration to remove the differentiation of "greenfield" and "non-greenfield" sites when determining whether it is technically feasible to route pump emissions to a control. A "greenfield" site is defined as a site, other than a natural gas processing plant, which is entirely new construction. This change would have no bearing on existing sources, as by definition they would all be "non-greenfield" sites under the 2016 NSPS. The EPA did not distinguish between "greenfield" and "non-greenfield" sites in the 2016 O&G CTG.

The Department also concurred with the EPA's proposal to allow in-house engineers to certify the determination of technical infeasibility to route pump emissions to a control and the design and capacity of a closed vent system, regardless of professional licensure. An in-house engineer is held to the same level of accountability as a professional engineer when complying with the certification requirements. Therefore, the Department incorporates the ability to use in-house engineers for the certification requirements in this proposed rulemaking. If this change is not adopted in the EPA's final 2016 NSPS rule and subsequently incorporated into the 2016 O&G CTG, this could be interpreted as a relaxation of the recommendation; however, the EPA could either accept the language in this proposed rulemaking or request that the Department modify the language in the final-form rulemaking.

The EPA states in the proposed withdrawal that "if finalized, the withdrawal would remove the mandatory RACT review requirement for affected sources in ozone nonattainment areas classified as Moderate or higher and states in the OTR." See 83 FR at 10479. However, the EPA noted that "unless and until EPA decides to withdraw the CTG, states remain obligated to revise their SIPs to address RACT requirements for oil and gas sources in ozone nonattainment areas classified as Moderate or higher and the states in the OTR." Id. The EPA goes on to state that "withdrawal of the CTG would not hinder states from establishing, where desired or otherwise required, emissions standards for sources in the oil and natural gas industry, including standards based on the recommendations contained in the withdrawn CTG." Id. If the 2016 O&G CTG is not withdrawn, states subject to RACT requirements must revise their SIPs for the 2008 and later ozone standards to include their RACT determinations for the oil and natural gas sources covered by the 2016 O&G CTG, no later than January 21, 2021. As previously stated, the states are responsible for attaining and maintaining the NAAQS.

This proposed rulemaking is designed to adopt VOC emission limitations and other requirements as RACT to meet the requirements of sections 172(c)(1), 182(b)(2) and 184(b)(1)(B) of the CAA. These VOC emission limitations and other requirements would apply across this Commonwealth as required under section 184(b)(1)(B) of the CAA. The proposed control measures would reduce VOC emissions from oil and natural gas sources throughout this Commonwealth at those affected sources that are not regulated elsewhere under Chapter 129.

Even though a finalized withdrawal of the 2016 O&G CTG would relieve this Commonwealth of the requirement to address RACT for existing oil and gas sources, the Department is still obligated to reduce ozone and VOC emissions as a precursor to ensure that the NAAQS is attained and maintained under section 110 of the CAA. 42 U.S.C.A. § 7410. The Board has the authority under section 5(a)(1) of the APCA to adopt rules and regulations for the prevention, control, reduction and abatement of air pollution in this Commonwealth. Addressing existing sources of VOC emissions is necessary to attain and maintain the NAAQS and protect public health and welfare from harmful air pollution.

(10) State why the regulation is needed. Explain the compelling public interest that justifies the regulation. Describe who will benefit from the regulation. Quantify the benefits as completely as possible and approximate the number of people who will benefit.

These VOC emission reductions accomplished through implementation of the regulatory amendments included in this proposal would benefit the health and welfare of the approximately 12.8 million residents and the numerous animals, crops, vegetation and natural areas of this Commonwealth by reducing the amount of ground-level ozone air pollution resulting from these sources.

VOCs are precursors to the formation of ground-level ozone, a public health and welfare hazard. Ground-level ozone is not emitted directly to the atmosphere from oil and natural gas sources but is formed by a photochemical reaction between emissions of VOCs and NO_x in the presence of sunlight. Ground-level ozone is a highly reactive gas, which at sufficiently high concentrations can produce a wide variety of effects harmful to public health and welfare. Additionally, climate change may exacerbate the need to address ground-level ozone. According to the EPA, atmospheric warming, as a result of climate change, may increase ground-level ozone in regions across the United States. This impact could also be an issue for states trying to comply with future ozone standards.

Ozone is an irritant and repeated exposure to ozone pollution for both healthy people and those with existing conditions may cause a variety of adverse health effects, including difficulty in breathing, chest pains, coughing, nausea, throat irritation, and congestion. In addition, people with bronchitis, heart disease, emphysema, asthma, and reduced lung capacity may have their symptoms exacerbated by ozone pollution. Asthma, in particular, is a significant and growing threat to children and adults in this Commonwealth. Ozone can also cause both physical and economic damage to important food crops, forests, and wildlife, as well as materials such as rubber and plastics. The implementation of additional measures to address ozone air quality in this Commonwealth is necessary to protect the public health and welfare and the environment. Because VOCs are precursors for ground-level ozone formation, implementing the RACT recommendations of the 2016 O&G CTG will help the Commonwealth achieve and maintain the 1997, 2008, and 2015 ozone NAAQS.

In addition, this proposed rulemaking is consistent with Governor Wolf's strategy to reduce emissions of methane from the oil and natural gas industry in this Commonwealth. Methane is a potent greenhouse gas with a global warming potential more than 28 times that of carbon dioxide over a 100-year time period, according to the EPA. The EPA has identified methane, the primary component of natural gas,

as the second-most prevalent greenhouse gas emitted in the United States from human activities. While this proposed rulemaking requires VOC emission reductions, methane emissions are also reduced as a co-benefit, because both VOCs and methane are emitted from oil and gas operations. Adoption of the VOC emission control measures and other requirements in this proposed rulemaking is in the public interest as it would allow the Commonwealth to make substantial progress in achieving and maintaining the 1997, 2008, and 2015 8-hour ozone NAAQS statewide. Implementation of and compliance with the proposed VOC emission reduction measures would also assist the Commonwealth in reducing the levels of ozone precursor emissions that contribute to potential nonattainment of the 2015 ozone NAAQS. As a result, the VOC emission control measures are reasonably necessary to attain and maintain the health-based and welfare-based 8-hour ozone NAAQS in this Commonwealth and to satisfy related CAA requirements. It would also provide VOC RACT as required for natural gas processing plants which have RACT requirements under the 1983 CTG for Control of Volatile Organic Compound Equipment Leaks from Natural Gas/Gasoline Processing Plants, EPA 450/3-83-007, Office of Air Quality Planning and Standards, EPA, December 1983. The Department would be able to certify this proposed rulemaking as RACT, instead of certifying NSPS requirements meeting RACT for natural gas processing facilities.

The Department estimates that implementation of the proposed control measures could reduce VOC emissions by as much as 983 TPY from fugitive emissions components through the performance of quarterly LDAR inspections, by as much as 121 TPY from the installation of controls for storage vessels with actual emissions based on the Department's more stringent applicability thresholds, 109 TPY from pneumatic pumps and 3,191 TPY from pneumatic controllers. As noted above, these reductions would benefit the health and welfare of all Pennsylvania residents.

Further, this proposed rulemaking will provide consistency among all oil and natural gas sources in this Commonwealth for monitoring fugitive emissions components by including monthly AVO inspection requirements and quarterly LDAR inspection requirements. These requirements are consistent with the LDAR requirements specified in the Department's General Plan Approval and/or General Operating Permit for Natural Gas Compression Stations, Processing Plants, and Transmission Stations (GP-5), the General Plan Approval and/or General Operating Permit for Unconventional Natural Gas Well Site Operations and Remote Pigging Stations (GP-5A), and Exemption 38. Since the Commonwealth's LDAR program is recognized as AMEL for the 2016 NSPS and the requirements of the 2016 NSPS and the 2016 O&G CTG are identical, the Commonwealth's LDAR program should be acceptable as AMEL for purposes of implementing the RACT requirements of the 2016 O&G CTG. This would have the benefit of providing owners and operators of both new and existing facilities with the ability to merge both types of sources into one LDAR program.

As noted above, while this proposed rulemaking requires VOC emission reductions, methane emissions are also reduced as a co-benefit, because both VOCs and methane are emitted from oil and gas operations. Except for storage vessels, the requirements for control of emissions are not dependent on an applicability threshold for VOCs, meaning that most requirements have no minimum level of VOC emissions under which sources are granted an exemption. For example, continuous bleed natural gas-driven pneumatic controllers are required to limit their bleed rate to 6 standard cubic feet (scf) per hour of natural gas, regardless of the VOC concentration, which also serves to limit methane emissions. Reciprocating compressors at gathering and boosting stations and natural gas processing plants are required to replace the rod end packing or route the rod end packing emissions to a closed vent system regardless of the actual VOC emissions, which serves to reduce both VOCs and methane emissions by limiting natural gas leakage. Both wet seal centrifugal compressor degassing systems and natural gas-driven diaphragm pumps are required to control their VOC emissions by 95% regardless of the actual

VOC emissions, which also effectively controls methane emissions. Also, for fugitive emissions components, the AVO inspection program and LDAR program detect natural gas leakage, which, with the repair requirement, serves to reduce both emissions of VOCs and methane. The above control measures implemented for VOC emissions simultaneously control methane emissions, providing a methane emission reduction of approximately 75,603 TPY. These reductions are significant, and the Board does not want to trade this environmental benefit for the uncertain withdrawal of the 2016 O&G CTG, which has already been judged technically sound.

Ozone NAAQS; Implementation of permanent and enforceable control measures for attainment and maintenance

In July 1997, the EPA promulgated primary and secondary ozone standards at a level of 0.08 parts per million (ppm) averaged over 8 hours. See 62 FR 38856 (July 18, 1997). In 2004, the EPA designated 37 counties in this Commonwealth as 8-hour ozone nonattainment areas for the 1997 8-hour ozone NAAQS. See 69 FR 23858, 23931 (April 30, 2004). Based on the certified ambient air monitoring data for the 2015 ozone season as well as the preliminary 2016 ozone season data, all monitored areas of this Commonwealth are attaining the 1997 8-hour ozone NAAQS.

In March 2008, the EPA lowered the primary and secondary ozone NAAQS to 0.075 ppm (75 parts per billion (ppb)) averaged over 8 hours to provide greater protection for children, other at-risk populations and the environment against the array of ozone-induced adverse health and welfare effects. See 73 FR 16436 (March 27, 2008). In May 2012, the EPA designated five areas in this Commonwealth as nonattainment for the 2008 ozone NAAQS. See 77 FR 30088, 30143 (May 21, 2012). These areas include all or a portion of Allegheny, Armstrong, Beaver, Berks, Bucks, Butler, Carbon, Chester, Delaware, Fayette, Lancaster, Lehigh, Montgomery, Northampton, Philadelphia, Washington and Westmoreland Counties. With regard to the 2008 ozone NAAQS, the certified 2015 ambient air ozone season monitoring data indicate that all areas of this Commonwealth are monitoring attainment of the 2008 ozone NAAQS. The Department's analysis of the preliminary 2016 ambient air ozone season monitoring data shows that ozone samplers in this Commonwealth, except the Bristol sampler in Philadelphia County, are monitoring attainment of the 2008 ozone NAAQS. As with the 1997 ozone NAAQS, the Department must ensure that the 2008 ozone NAAQS is attained and maintained by implementing permanent and enforceable control measures. Adoption of the VOC emission control measures in this proposed rulemaking would allow the Commonwealth to continue its progress in attaining and maintaining the 2008 8-hour ozone NAAQS.

On October 26, 2015, the EPA again lowered the primary and secondary ozone NAAQS, this time to 0.070 ppm (70 ppb) averaged over 8 hours. See 80 FR 65291 (October 26, 2015). On June 4, 2018, the EPA designated Bucks, Chester, Delaware, Montgomery and Philadelphia counties as marginal nonattainment for the 2015 ozone NAAQS, with the rest of this Commonwealth designated attainment/unclassifiable. See 83 FR 25776 (June 4, 2018).

The Department must ensure that the 2015 8-hour ozone NAAQS is attained and maintained by implementing permanent and federally enforceable control measures. Reductions in VOC emissions that are achieved following the adoption and implementation of RACT emission control measures for source categories covered by this proposed rulemaking will assist the Commonwealth in making substantial progress in achieving and maintaining the ozone NAAQS. To the extent that any of the requirements in this proposed rulemaking are more stringent than any provisions of the 2016 O&G CTG, the proposed requirements are reasonably necessary to attain and maintain the health-based and welfare based 8-hour ozone NAAQS in this Commonwealth and to satisfy related CAA requirements.

Monetized public health benefits of attaining the 2008 and 2015 ozone NAAQS

The EPA estimated that the monetized health benefits of attaining the 2008 8-hour ozone NAAQS of 0.075 ppm range from \$8.3 billion to \$18 billion on a National basis by 2020. Prorating that benefit to this Commonwealth, based on population, results in a public health benefit of \$337 million to \$732 million. Similarly, the EPA estimated that the monetized health benefits of attaining the 2015 8-hour ozone NAAQS of 0.070 ppm range from \$1.5 billion to \$4.5 billion on a National basis by 2025. Prorating that benefit to this Commonwealth, based on population, results in a public health benefit of \$63 million to \$189 million. The Department is not stating that these estimated monetized health benefits would all be the result of implementing the proposed RACT measures, but the EPA estimates are indicative of the benefits to Commonwealth residents of attaining the 2008 and 2015 8-hour ozone NAAQS through the implementation of a suite of measures to control VOC emissions in the aggregate from different source categories

Adverse health and welfare effects of ground-level ozone on humans, animals, and the environment

Exposure to high levels of ground-level ozone air pollution correlates to increased respiratory disease and higher mortality rates. Ozone can inflame and damage the lining of the lungs. Within a few days, the damaged cells are shed and replaced. Over a long time period, lung tissue may become permanently scarred, resulting in permanent loss of lung function and a lower quality of life. When ambient ozone levels are high, more people with asthma have attacks that require a doctor's attention or use of medication. Ozone also makes people more sensitive to allergens including pet dander, pollen and dust mites, all of which can trigger asthma attacks. The EPA has concluded that there is an association between high levels of ambient ozone and increased hospital admissions for respiratory ailments including asthma. While children, the elderly and those with respiratory problems are most at risk, even healthy individuals may experience increased respiratory ailments and other symptoms when they are exposed to high levels of ambient ozone while engaged in activities that involve physical exertion. High levels of ground-level ozone also affect animals including pets, livestock and wildlife, in ways similar to humans.

In addition to causing adverse human and animal health effects, the EPA has concluded that ground-level ozone affects vegetation and ecosystems, leading to reductions in agricultural crop and commercial forest yields by destroying chlorophyll; reducing the size and quality of seeds; reducing growth and survivability of tree seedlings; and increasing plant susceptibility to disease, pests and other environmental stresses, including harsh weather. In long-lived species, these effects may become evident only after several years or even decades and have the potential for long-term adverse impacts on forest ecosystems. Ozone damage to the foliage of trees and other plants can decrease the aesthetic value of ornamental species used in residential landscaping, as well as the natural beauty of parks and recreation areas. Through deposition, ground-level ozone also contributes to pollution in the Chesapeake Bay. These effects can have adverse impacts including loss of species diversity and changes to habitat quality and water and nutrient cycles. High levels of ground-level ozone can also cause damage to buildings and synthetic fibers, including nylon, plastic, and rubber, and reduce visibility on roadways and in natural areas.

Adverse effects of ground-level ozone on this Commonwealth's economy

Ground-level ozone also impacts this Commonwealth's farm crops, fruit industries, forests, parks and timber. The economic value of some welfare losses due to high concentrations of ground-level ozone can be calculated, such as crop yield loss from both reduced growth and smaller, lower-quality seeds and

tubers with less oil or protein. If ozone episodes last a few days, visible injury to some leaf crops, including lettuce, spinach and tobacco, as well as visible injury to the leaves of ornamental plants, including grass, flowers and shrubs, can appear. This injury can be seen as small pale yellow or brown blotches, below which the cells have died. Other types of welfare loss may not be quantifiable, such as the reduced aesthetic value of trees growing in heavily visited parks.

Information about the economic benefit of the agricultural industry to this Commonwealth is provided by the Pennsylvania Department of Agriculture (PDA). This Commonwealth has more than 58,000 farms occupying more than 7.7 million acres of farmland which account for 81,345 direct jobs and \$9.2 billion in direct economic output from production agriculture. In addition to production agriculture, the industry also raises revenue and supplies jobs through support services such as food processing, marketing, transportation, farm equipment and landscaping. In total, production agriculture and agribusiness contribute 215,985 jobs and \$78.8 billion to this Commonwealth's economy.¹ The economic value of crop yield loss due to high concentration of ground-level ozone can be calculated from both reduced seed production and visible injury to some leaf crops, including lettuce, spinach and tobacco, as well as visible injury to ornamental plants, including grass, flowers and shrubs. Reducing ground-level ozone concentrations will serve to protect agricultural yield and reduce losses to production agriculture and agribusiness in this Commonwealth.

This Commonwealth is forested over a total of 16.8 million acres, which represents 58% of its land area. Federal, state, and local government hold 5.1 million acres in public ownership, with the remaining 11.7 million acres in private ownership.² The forest product industry only owns 0.4 million acres of forest, with the remainder held by an estimated 750,000 individuals, families, partnerships, or corporations.³ This Commonwealth leads the Nation in volume of hardwood with over 120.5 billion board feet of standing sawtimber.⁴ Recent data shows that the state's forest growth-to-harvest rate is better than 2 to 1.⁵ As the leading producer of hardwood lumber in the United States, this Commonwealth also leads in the export of hardwood lumber, exporting nearly \$560 million in 2017, and over \$1.3 billion in lumber, logs, furniture and paper products to more than 70 countries around the world. Production is estimated at 1 billion board feet of lumber annually.⁶ This vast renewable resource puts the hardwoods industry at the forefront of manufacturing in this Commonwealth. Forestry production and processing account for 64,515 direct jobs and \$27.7 billion in direct economic output and direct value added to Pennsylvania's economy.⁷ Reducing ground-level ozone concentrations will serve to protect the Commonwealth's position as the leader of growing volume of hardwood species and producer of hardwood lumber in Nation.

¹ PDA, Pennsylvania Agriculture: A Look at the Economic Impact and Future Trends, May 2018, <https://econsultsolutions.com/wp-content/uploads/2018/06/TEAM-PA-AGRICULTURE-FINAL-REPORT.pdf>.

² United States Department of Agriculture, Forests of Pennsylvania, 2018, https://public.tableau.com/views/FIA_OneClick_V1_2/Factsheet?%3AshowVizHome=no.

³ PennState Extension, Forest Management and Timber Harvesting in Pennsylvania, 2019, https://www.agriculture.pa.gov/Business_Industry/HardwoodDevelopmentCouncil/Documents/EE0249%20Timber%20Harvesting_Final.pdf.

⁴ *Id.*

⁵ United States Department of Agriculture, Forests of Pennsylvania, 2018, https://public.tableau.com/views/FIA_OneClick_V1_2/Factsheet?%3AshowVizHome=no.

⁶ PDA, Response to Email Inquiry, 2019.

⁷ PDA, Pennsylvania Agriculture: A Look at the Economic Impact and Future Trends, May 2018, <https://econsultsolutions.com/wp-content/uploads/2018/06/TEAM-PA-AGRICULTURE-FINAL-REPORT.pdf>.

The Pennsylvania Department of Conservation and Natural Resources (DCNR) is the steward of the state-owned forests and parks. DCNR awards millions of dollars in construction contracts each year to build and maintain the facilities in its parks and forests. Hundreds of concessions throughout the park system help complete the park experience for both state and out-of-state visitors. State forests, parks and game lands make up 3.9 million acres of forest land. This Commonwealth's 2.2 million-acre state forest system, found in 48 of this Commonwealth's 67 counties, comprises 13% of the forested area in the Commonwealth.⁸ The state forest represents one of the largest expanses of public forestland in the eastern United States, making it a truly priceless public asset. Ozone damage to the foliage of trees and other plants can decrease the aesthetic value of ornamental species used in residential landscaping, as well as the natural beauty of parks and recreation areas. However, the effects of the reduced aesthetic value of trees in heavily visited parks may not be quantifiable. Reducing the concentration of ground-level ozone will help maintain the benefits to this Commonwealth's economy due to tourism.

Through deposition, ground-level ozone also contributes to pollution in the Chesapeake Bay which can have adverse impacts including loss of species diversity and changes to habitat quality and water and nutrient cycles. High levels of ground-level ozone can also cause damage to buildings and synthetic fibers, including nylon, plastic, and rubber, and reduced visibility on roadways and in natural areas. The reduction of ground-level ozone air pollution concentrations directly benefits the human and animal populations of the Commonwealth with improved ambient air quality and healthier environments. The agriculture and timber industries and related businesses benefit directly from reduced economic losses that result from damage to crops and timber. Likewise, the natural areas and infrastructure within this Commonwealth and downwind states benefit directly from reduced environmental damage and economic losses.

(11) Are there any provisions that are more stringent than federal standards? If yes, identify the specific provisions and the compelling Pennsylvania interest that demands stronger regulations.

The Department determined in two cases that more stringent RACT requirements are necessary. In the first, the Department determined that a lower VOC applicability threshold is necessary for storage vessels at unconventional well sites installed on or after August 10, 2013 to prevent backsliding and that the lower applicability threshold also represents RACT for storage vessels at gathering and boosting stations, processing plants, and transmission stations. For a storage vessel at a conventional well site or at an unconventional well site installed prior to August 10, 2013, the potential to emit (PTE) threshold of 6.0 TPY VOC is as recommended in Section A.1(a) of the 2016 O&G CTG. For a storage vessel at an unconventional well site installed on or after August 10, 2013 or at a natural gas gathering and boosting station, a natural gas processing plant, or in the natural gas transmission and storage segment, the recommended VOC potential to emit PTE threshold of 6 TPY which requires VOC control of 95%, would be reduced to 2.7 TPY PTE. The more stringent 2.7 TPY threshold is based on the threshold used under Exemption 38(b) of the Air Quality Permit Exemptions List, which has been in effect since August 10, 2013. Consistent with the exception for control based on the demonstration of actual VOC emissions, the actual emission threshold of 4 TPY would be reduced to 2.7 TPY for these sources. For a storage vessel at other facilities including a conventional well site or an unconventional well site constructed before August 10, 2013, the original PTE threshold of 6 TPY VOC and actual emissions threshold of 4 TPY VOC would continue to apply.

⁸ PA DCNR, DCNR Bureau of Forestry - Our Mission and What We Do, October 2017, http://www.docs.dcnr.pa.gov/cs/groups/public/documents/document/dcnr_20033260.pdf.

In the second, the Department determined that owners or operators must conduct quarterly LDAR inspections of fugitive emissions components at their facilities, as opposed to the recommended semiannual frequency in the 2016 O&G CTG. If the percentage of leaking components is less than 2% for two consecutive quarterly inspections, the owner or operator would have the option to reduce the LDAR inspection frequency to semiannually. In addition, the owners and operators of well sites and gathering and boosting stations have a monthly AVO inspection requirement, which is not a recommendation of the 2016 O&G CTG.

This proposed rulemaking will provide consistency among all oil and natural gas sources in this Commonwealth for monitoring fugitive emissions components by including monthly AVO inspection requirements and quarterly LDAR inspection requirements. These requirements are consistent with the LDAR requirements specified in GP-5, GP-5A, and Exemption 38. Since the Commonwealth's LDAR program is recognized as AMEL for the 2016 NSPS and the requirements of the 2016 NSPS and the 2016 O&G CTG are identical, the Commonwealth's LDAR program should be acceptable as AMEL for purposes of implementing the RACT requirements of the 2016 O&G CTG. This would have the benefit of providing owners and operators of both new and existing facilities with the ability to merge both types of sources into one LDAR program.

Regardless of the outcome on the Federal level, the Commonwealth is responsible for ensuring that the 2015 8-hour ozone NAAQS is attained and maintained by implementing permanent and federally enforceable control measures. This proposed rulemaking is a primary component of the Commonwealth's strategy of ensuring that the NAAQS are attained and maintained across this Commonwealth. Reductions in VOC emissions that are achieved following the adoption and implementation of RACT emission control measures for source categories covered by this proposed rulemaking will assist the Commonwealth in making substantial progress in achieving and maintaining the ozone NAAQS. To the extent that any of the requirements in this proposed rulemaking are more stringent than any provisions of the 2016 O&G CTG, the proposed requirements are reasonably necessary to attain and maintain the health-based and welfare based 8-hour ozone NAAQS in this Commonwealth and to satisfy related CAA requirements.

(12) How does this regulation compare with those of the other states? How will this affect Pennsylvania's ability to compete with other states?

The 2016 O&G CTG applies to affected sources in areas of nonattainment and the OTR. The Department contacted representatives from Maryland, New York, Ohio, Texas and West Virginia; all stated that they do not have affected sources. The remaining states in the OTR (Connecticut, Delaware, Maine, Massachusetts, New Hampshire, New Jersey, Rhode Island and Vermont, as well as the District of Columbia) do not have the affected oil and gas sources.

Several states regulate VOC emissions from storage vessels used in the oil and natural gas industry. There are also a few states (e.g., California, Colorado and Montana) that have established specific regulations that control VOC emissions from emission sources in the oil and natural gas industry (e.g., compressors, pneumatic controllers and fugitive emission components).

CALIFORNIA AIR RESOURCES BOARD

The California Air Resources Board (CARB) has a statewide methane rule for sources in the oil and gas industry, entitled *Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities*. See 17 CCR §§ 95665—95677.

For storage vessels, the CARB rule requires separators and tank systems not controlled by a vapor collection system to conduct a flash analysis. If the annual emission rate is greater than 10 metric tons of methane, emissions must be controlled by a vapor collection system. If the annual emission rate is less than 10 metric tons, the owner or operator must conduct an annual flash analysis for 3 years; if the annual emission rate is consistently less than 10 metric tons, reduce testing to once every 5 years. For circulation tanks used for well stimulation treatments, owners and operators must implement best practices to reduce emissions.

For natural gas-driven pneumatic controllers, the CARB rule requires that continuous bleed controllers shall not vent to the atmosphere and that each device must be inspected during each LDAR inspection. Continuous bleed controllers installed prior to January 1, 2016 may be used, provided they have a bleed rate of less than or equal to 6 standard cubic feet per hour (scfh); are tested annually using a direct measurement method; those with a bleed rate of greater than 6 scfh must be repaired within 14 calendar days. Each device that must be replaced or retrofitted to comply shall either be controlled by a vapor collection system or be replaced with compressed air or an electricity driven controller. Intermittent bleed controllers must be inspected during each LDAR inspection while the device is idle and not controlling.

For natural gas-driven diaphragm pumps, the CARB rule requires that pumps shall not vent to the atmosphere and that each pump must be inspected during each LDAR inspection. Each device that must be replaced or retrofitted to comply shall either be controlled by a vapor collection system or be replaced with compressed air or an electricity driven pump.

For reciprocating compressors at production facilities, the CARB rule requires rod packings or seals be inspected during each LDAR inspection and repaired within 30 days of detection. For reciprocating compressors at natural gas gathering and boosting stations, processing plants, transmission stations, and underground storage facilities, the CARB rule requires rod packings or seals be inspected during each LDAR inspection; the rod packing or seal emission rate be tested annually using a direct measurement method; those with a rod packing or seal emission rate greater than 2 standard cubic feet per minute (scfm), or a combined emission rate greater than the number of compression cylinders multiplied by 2 scfm must be repaired within 30 calendar days. Alternatively, emissions shall be controlled by a vapor collection system.

For wet seal centrifugal compressors, the CARB rule requires components on driver engines and compressors be inspected during each LDAR inspection; the wet seal emission flow rate be tested annually using a direct measurement method; those with a wet seal emission flow rate greater than 3 scfm, or a combined wet seal emission rate greater than the number of wet seals multiplied by 3 scfm must be repaired within 30 days of detection. If no parts are available to make repairs, the wet seal must be replaced with a dry seal no later than January 1, 2020. Alternatively, emissions shall be controlled by a vapor collection system.

For dry seal centrifugal compressors, the CARB rule requires components on driver engines and compressors be inspected during each LDAR inspection.

For fugitive emissions components, the CARB rule requires quarterly inspections with at least one quarterly inspection performed using EPA Method 21, 40 CFR Part 60, Appendix A-7 (Method 21). Optical Gas Imaging (OGI) may be used for the remaining inspections, however any leak detected must be measured within 2 calendar days using Method 21. For unsafe or inaccessible components, the CARB rule requires annual inspection using Method 21. If additional inspections are performed using

OGI, any detected leak must be measured within 14 calendar days using Method 21. A facility with less than or equal to 200 components may have 5 leaks greater than or equal to 1,000 ppm and less than or equal to 9,999 ppm which must be repaired within 14 calendar days unless it is a critical component. A facility with less than or equal to 200 components may have 2 leaks greater than or equal to 10,000 ppm and less than or equal to 49,999 ppm which must be repaired within 5 calendar days unless it is a critical component. A facility with greater than 200 components may have 2% of inspected components with leaks greater than or equal to 1,000 ppm and less than or equal to 9,999 ppm which must be repaired within 14 calendar days unless it is a critical component. A facility with greater than 200 components may have 1% of inspected components with leaks greater than or equal to 10,000 ppm and less than or equal to 49,999 ppm which must be repaired within 5 calendar days unless it is a critical component. There are no allowable leaks with a detected leak greater than or equal to 50,000 ppm; the leak must be repaired within 2 calendar days unless it is a critical component.

For facilities visited daily, daily AVO inspections of hatches, pressure-relief valves, well casings, stuffing boxes and pump seals are required. For facilities not visited daily, weekly AVO inspections of hatches, pressure-relief valves, well casings, stuffing boxes and pump seals are required. Annual AVO inspections must be completed of all pipes. Any leak detected during an AVO inspection and not repaired within 24 hours of detection must be measured using Method 21.

For fugitive emissions components, the CARB rule requires that components that incur 5 repair actions in a year must be replaced with a compliant component and reinspected using Method 21.

For fugitive emissions components, the CARB rule allows delay of repair for parts on order not to exceed 30 calendar days unless approved by the Executive Officer. If a gas service utility provides documentation that the system is temporarily classified as critical to reliable public gas system operation or if the owner or operator demonstrates the component is a critical component, the repair must be completed by the end of the next process shutdown or within 12 months, whichever is sooner.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

The South Coast Air Quality Management District (SCAQMD) has Rule 463⁹ for organic liquid storage and Rule 1173¹⁰ for control of VOC leaks and releases from components at petroleum facilities and chemical plants.

For storage vessels, the SCAQMD rule requires storage vessels with a capacity greater than or equal to 19,815 gallons and containing an organic liquid with a true vapor pressure (TVP) greater than or equal to 1.5 pounds per square inch absolute (psia) under actual storage conditions or with a capacity greater than or equal to 39,630 gallons and containing an organic liquid with a TVP greater than or equal to 0.5 psia under actual storage conditions to control using either an external floating roof; internal floating-type cover; vapor recovery system that routes emissions to a fuel gas system or reduces emissions by 95% by weight when compared to a fixed cone roof tank holding the same liquid without control or vapor recovery system; or other approved equivalent control.

For fugitive emissions components, the SCAQMD rule requires quarterly inspection of all accessible components in light liquid/gas/vapor service and pumps in heavy liquid service using Method 21. For inaccessible components in light liquid/gas/vapor service, annual inspection using Method 21 is required.

⁹ SCAQMD, Organic Liquid Storage, Rule 463, November 4, 2011, <https://ww3.arb.ca.gov/drdb/sc/curhtml/r463.pdf>.

¹⁰ SCAQMD, Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants, Rule 1173, February 6, 2009, <https://ww3.arb.ca.gov/drdb/sc/curhtml/r1173.pdf>.

For pressure-relief devices that vent to the atmosphere, inspection within 1 calendar day and reinspection within 14 calendar days after every release are required.

For pumps, compressors and atmospheric pressure-relief devices, the SCAQMD rule requires AVO inspection every 8 hours unless the source is located at an unmanned production field or pipeline transfer station.

For fugitive emissions components, the SCAQMD rule defines a major leak in light liquid/gas/vapor service as greater than 10,000 ppm for valves, pumps, compressors, threaded connections, or other components; as greater than 200 ppm for pressure-relief devices; as a light liquid leak greater than 3 drops per minute. A minor leak in light liquid/gas/vapor service is defined as greater than or equal to 500 ppm and less than or equal to 10,000 ppm for valves, pumps, compressors, threaded connections or other components. A major leak in heavy liquid service is defined as greater than 500 ppm for valves, compressors, threaded connectors or other components; as greater than 100 ppm for pumps; as greater than 200 ppm for pressure-relief devices; as a heavy liquid leak greater than 3 drops per minute. A minor leak in heavy liquid service is defined as greater than or equal to 100 ppm and less than 500 ppm for valves, compressors, threaded connections or other components. For facilities with less than or equal to 200 components, valves, compressors, pressure-relief devices, threaded connections and other components, the sources are allowed to have 1 leak; pumps are allowed to have 2 leaks. For facilities with greater than 200 components, valves and threaded connectors are allowed to have leaks equal to 0.5% of total components inspected; pumps are allowed to have leaks equal to 1% of total components inspected; compressors, pressure-relief devices, and other components are allowed to have 1 leak.

For fugitive emissions components, the SCAQMD rule requires that minor leaks for components in light liquid/gas/vapor service and heavy liquid service be repaired within 7 calendar days with an additional 7 calendar days extended repair period. A heavy liquid leak with greater than 3 drops per minute and a minor leak by concentration have a repair period of 7 calendar days with no extended repair period. A major leak greater than 25,000 ppm has a repair period of 2 calendar days with an additional 3 calendar days extended repair period. A major leak greater than or equal to 25,000 ppm has a repair period of 1 calendar day with no extended repair period. A major leak for a component in heavy liquid service has a repair period of 1 calendar day with no extended repair period. A light liquid leak greater than 3 drops per minute has a repair period of 1 calendar day with no extended repair period. The extended repair period can be used for a total number of leaking components not to exceed 0.05% of the number of components inspected, by type, rounded to the nearest integer.

For fugitive emissions components, the SCAQMD rule requires that components that incur five repair actions in a year must be replaced or retrofitted with an applicable technology, replaced with a best available control technology (BACT) equipment, or vented to an air pollution control device approved by the Executive Officer.

SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT

The San Joaquin Valley Air Pollution Control District (SJVAPCD) has Rule 4409¹¹ for components at light crude oil production facilities, natural gas production facilities, and natural gas processing facilities and Rule 4623¹² for storage of organic liquids.

¹¹ SJVAPCD, Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities, Rule 4409, April 20, 2005, <https://ww3.arb.ca.gov/drdb/sju/curhtml/r4409.pdf>.

¹² SJVAPCD, Storage of Organic Liquids, Rule 4623, May 19, 2005, <https://ww3.arb.ca.gov/drdb/sju/curhtml/r4623.pdf>.

For storage vessels, the SJVAPCD rule requires storage vessels with a capacity greater than or equal to 1,100 gallons and less than or equal to 19,800 gallons and a TVP greater than or equal to 0.5 psia and less than 11 psia to control using either a pressure-vacuum relief valve, internal floating roof, external floating roof or vapor recovery system and with a TVP greater than or equal to 11 psia to control using a pressure vessel or vapor recovery system. The rule requires storage vessels with a capacity greater than 19,800 gallons and less than or equal to 39,600 gallons and a TVP greater than or equal to 0.5 psia and less than 1.5 psia to control using either a pressure-vacuum relief valve, internal floating roof, external floating roof or vapor recovery system; with a TVP greater than or equal to 1.5 psia and less than 11 psia to control using either an internal floating roof, external floating roof or vapor recovery system; and with a TVP greater than or equal to 11 psia to control using a pressure vessel or vapor recovery system. The rule requires storage vessels with a capacity greater than 39,600 gallons and a TVP greater than or equal to 0.5 psia and less than 11 psia to control using either an internal floating roof, external floating roof or vapor recovery system and with a TVP greater than or equal to 11 psia to control using a pressure vessel or vapor recovery system. There are also different requirements for small producers based on their crude oil throughput.

For fugitive emissions components, the SJVAPCD rule requires quarterly inspection of all accessible components using Method 21. For unsafe or inaccessible components, inspection must occur annually using Method 21. Frequency may be reduced to annually for components, except for pumps, compressors, and pressure-relief devices, provided there is not a violation during five consecutive quarterly inspections, the operator did not receive a notice of violation during the previous 12 months, and the reduction in frequency is requested in writing with the documentation to demonstrate these requirements have been met.

For facilities visited daily, daily AVO inspections of operating pumps, compressors, and pressure-relief valves. For facilities not visited daily, weekly AVO inspections is required of operating pumps, compressors, and pressure-relief valves. Annual AVO inspections are required of all pipes. Any leak detected during an AVO inspection not repaired within 24 hours of detection must be measured using Method 21.

For fugitive emissions components, the SJVAPCD rule defines a major leak as greater than 10,000 ppm for all components. A minor leak in light liquid service is defined as greater than or equal to 1,000 ppm and less than or equal to 10,000 ppm for all components other than pressure-relief devices; for a pressure-relief device a leak in light liquid service is defined as greater than or equal to 200 ppm and less than or equal to 10,000 ppm. A minor leak in gas/vapor service is defined as greater than or equal to 2,000 ppm and less than or equal to 10,000 ppm for all components other than pressure-relief devices; for a pressure-relief device a leak in gas/vapor service is defined as greater than or equal to 400 ppm and less than or equal to 10,000 ppm. For facilities with less than or equal to 200 components, valves, threaded connections, flanges, compressors, pressure-relief devices and other components are allowed to have 1 leak; pumps, pipes at production facilities, and pipes at natural gas processing facilities are allowed to have 2 leaks; polished rod stuffing boxes are allowed to have 4 leaks. For facilities with greater than 200 components, valves, threaded connectors, and flanges are allowed to have leaks equal to 0.5% of total components inspected; pumps and pipes at production facilities are allowed to have leaks equal to 1% of total components inspected; compressors, pressure-relief devices, and other components are allowed to have 1 leak; pipes at natural gas processing facilities are allowed to have 2 leaks; polished rod stuffing boxes are allowed to have leaks equal to 2% of total components inspected.

For fugitive emissions components, the SJVAPCD rule allows minor leaks 7 calendar days for repair with an additional 7 calendar days extended repair period unless it is a critical component. A major leak

less than or equal to 50,000 ppm has a repair period of 5 calendar days with an additional 2 calendar days extended repair period unless it is a critical component. A major leak greater than 50,000 ppm has a repair period of 2 calendar day with no extended repair period unless it is a critical component. The extended repair period can be used for a total number of leaking components not to exceed 0.05% of the number of components inspected, by type, rounded to the nearest integer.

For fugitive emissions components, the SJVAPCD rule requires that components that incur five repair actions in a year must be replaced or retrofitted with an applicable technology, replaced with a BACT equipment meeting Rule 2201,¹³ vented to a closed vent system, or removed from operation. A critical component must be repaired by the end of the next process shutdown or within 12 months, whichever is sooner.

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

The Colorado Department of Public Health and Environment, Air Quality Control Commission developed a regulation applicable to oil and natural gas industry emission sources covered by the 2016 O&G CTG, entitled *Regulation Number 7 Control of Ozone via Ozone Precursors and Control of Hydrocarbons via Oil and Gas Emissions (emissions of volatile organic compounds and nitrogen oxides)*. See 5 CCR § 1001-9.

At production facilities in ozone nonattainment areas

Condensate storage tanks with actual uncontrolled VOC emissions greater than or equal to 2 TPY require 90% reduction on a calendar weekly basis from May 1 through September 30 and require 70% reduction on a calendar monthly basis from October 1 through April 30.

Natural gas-driven pneumatic controllers are required to be replaced or retrofitted such that emissions are reduced to less than or equal to 6 scfh unless a higher bleed rate is required for safety or process purposes.

Natural gas-driven diaphragm pump emissions are required to be routed to a control device or process unless technically infeasible. VOC emissions must be reduced by 95% or the highest destruction efficiency the control can achieve.

Fugitive emissions components require annual LDAR for facilities emitting greater than 1 TPY VOC and less than or equal to 6 TPY VOC and semiannual LDAR for facilities emitting greater than 6 TPY VOC. LDAR can be with Forward-Looking Infrared (FLIR) imaging, with a leak definition of any visible emission, or Method 21 with a leak definition of 500 ppm as methane. Leaking components must have a first attempt to repair within 5 calendar days, with repair completed no later than 30 calendar days unless delay of repair is necessary. Repairs must be remonitored within 15 calendar days. Delay of repair is allowed for ordering parts required for repair, which must be completed within 15 calendar days of receipt of parts or if a shutdown is required for repair, which must be completed at the next scheduled shutdown but no later than 2 years.

¹³ SJVAPCD, New and Modified Stationary Source Review Rule, Rule 2201, April 21, 2011, <https://ww3.arb.ca.gov/drdb/sju/curhtml/r2201.pdf>.

At compressor stations and processing plants in ozone nonattainment areas

Storage vessels with actual uncontrolled VOC emissions greater than or equal to 2 TPY require 95% reduction on a 12-month rolling basis.

Natural gas-driven pneumatic controllers at compressor stations are required to be replaced or retrofitted such that emissions are reduced to less than or equal to 6 scfh unless a higher bleed rate is required for safety or process purposes. Natural gas-driven pneumatic controllers at processing plants are required to have a bleed rate of zero unless required for safety or process purposes.

Natural gas-driven diaphragm pumps at processing plants are required to have zero emissions.

Reciprocating compressor rod end packings are required to be replaced every 26,000 hours of operation or every 36 months. Alternatively, emissions from the rod end packing can be routed to a process through a closed vent system.

Centrifugal compressor wet seal degassing system emissions are required to be routed to a control device achieving 95% destruction efficiency through a closed vent system.

Fugitive emissions components require quarterly LDAR at compressor stations. LDAR can be with FLIR imaging, with a leak definition of any visible emission, or Method 21 with a leak definition of 500 ppm as methane. Leaking components must have a first attempt to repair within 5 calendar days, with repair completed no later than 30 calendar days unless delay of repair is necessary. Repairs must be remonitored within 15 calendar days. Delay of repair is allowed for ordering parts required for repair, which must be completed within 15 calendar days of receipt of parts or if a shutdown is required for repair, which must be completed at the next scheduled shutdown but no later than 2 years.

Fugitive emission components at processing plants require LDAR in accordance with 40 CFR Part 60, Subpart OOOOa (relating to standards of performance for crude oil and natural gas facilities for which construction, modification or reconstruction commenced after September 18, 2015), if applicable; otherwise, in accordance with 40 CFR Part 60, Subpart OOOO (relating to standards of performance for crude oil and natural gas production, transmission and distribution for which construction, modification or reconstruction commenced after August 23, 2011, and on or before September 18, 2015) regardless of construction date.

At oil and gas facilities across the state

Condensate storage vessels with actual uncontrolled VOC emissions greater than or equal to 20 TPY require 95% reduction on a 12-month rolling basis. Other storage vessels with actual uncontrolled VOC emissions greater than or equal to 6 TPY require 95% reduction on a 12-month rolling basis unless a combustion control device authorized on or after May 1, 2014 is used in which case it must have a design 98% destruction efficiency.

Natural gas-driven pneumatic controllers at production facilities and compressor stations are required to be replaced or retrofitted such that emissions are reduced to less than or equal to 6 scfh unless a higher bleed rate is required for safety or process purposes. Natural gas-driven pneumatic controllers at processing plants are required to have a bleed rate of zero unless required for safety or process purposes.

Fugitive emissions components require one time only LDAR and monthly AVO inspections for production facilities emitting greater than 0 TPY VOC and less than or equal to 6 TPY VOC; annual

LDAR and monthly AVO inspections for production facilities emitting greater than 6 TPY VOC and less than or equal to 12 TPY VOC; quarterly LDAR and monthly AVO inspections for production facilities with storage vessels emitting greater than 12 TPY VOC and less than or equal to 50 TPY VOC and for production facilities without storage vessels emitting greater than 12 TPY VOC and less than or equal to 20 TPY VOC; and monthly LDAR for production facilities with storage vessels emitting greater than 50 TPY VOC and for production facilities without storage vessels emitting greater than 20 TPY VOC. LDAR can be with FLIR imaging, with a leak definition of any visible emission, or Method 21 with a leak definition of 500 ppm as methane. Leaking components must have a first attempt to repair within 5 calendar days, with repair completed no later than 30 calendar days unless delay of repair is necessary. Repairs must be remonitored within 15 calendar days. Delay of repair allowed for order of parts required for repair, which must be completed within 15 calendar days of receipt of parts or if a shutdown is required for repair, which must be completed at the next scheduled shutdown but no later than 2 years.

Fugitive emissions components require annual LDAR for compressor stations emitting greater than 0 TPY VOC and less than or equal to 12 TPY VOC; quarterly for compressor stations emitting greater than 12 TPY VOC and less than or equal to 50 TPY VOC; and monthly for compressor stations emitting greater than 50 TPY VOC. LDAR can be with FLIR imaging, with a leak definition of any visible emission, or Method 21 with a leak definition of 2,000 ppm as methane for compressor stations constructed prior to May 1, 2014 and a leak definition of 500 ppm as methane for compressor stations constructed on or after May 1, 2014. Leaking components must have a first attempt to repair within 5 calendar days, with repair completed no later than 30 calendar days unless delay of repair is necessary. Repairs must be remonitored within 15 calendar days. Delay of repair is allowed for ordering of parts required for repair, which must be completed within 15 calendar days of receipt of parts or if a shutdown is required for repair, which must be completed at the next scheduled shutdown but no later than 2 years.

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

The Montana Department of Environmental Quality requires oil and gas well facilities to control emissions from the time the well is completed until the source is registered or permitted. Subchapter 16 implements emission control requirements for oil and gas well facilities operating prior to the issuance of a Montana Air Quality Permit. See ARM 17.8.1601—1606. Subchapter 17 implements the registration of air contaminant sources. See ARM 17.8.1701—1713.

For storage vessels with a PTE greater than or equal to 15 TPY VOC and vapors of 500 British thermal unit/standard cubic feet (Btu/scf) in subchapter 16 or 200 Btu/scf in subchapter 17, emissions must be captured and routed to a gas pipeline, routed to a smokeless combustion system or air pollution control device capable of achieving 95% emissions reduction.

For all piping components, a monthly AVO inspection must be conducted. Leaking components must have a first attempt to repair within 5 calendar days, with repair completed as soon as practicable but no later than 15 calendar days unless delay of repair is necessary. Delay of repair is allowed if a shutdown is required for repair, which must be completed before the end of the first facility shutdown after the leak is detected.

OHIO ENVIRONMENTAL PROTECTION AGENCY

On November 20, 2018, the Ohio Environmental Protection Agency (Ohio EPA) issued a request for preliminary input from stakeholders on potential regulations aimed at air pollution emissions from

unconventional oil and gas facilities not currently covered by existing permits and/or state regulations.¹⁴ The regulations would cover similar equipment and requirements currently covered in the 2016 NSPS, as well as Ohio EPA's oil and gas general permits. The regulations would also cover both existing and new sources, such as oil and gas well sites and gas compressor stations.

For storage vessels at production facilities, with a total capacity less than or equal to 252,000 gallons where each individual vessel has a capacity less than or equal to 39,894 gallons, total VOC emissions including breathing, working, and flashing losses from all storage vessels shall not exceed 4.28 tons per month averaged over a 12-month rolling period. To comply with the ton per month limit, the owner or operator must utilize one or more add-on controls.

For storage vessels at natural gas compressor stations and similar facilities, used for condensate, produced water, crude oil and/or petroleum liquids with a capacity less than or equal to 21,000 gallons using add-on controls for materials under ambient conditions and total VOC emissions including breathing, working and flashing, losses shall not exceed 0.50 tons per month averaged over a 12-month rolling period. To comply with the ton per month limit, the owner or operator must utilize one or more add-on controls.

For natural gas-driven pneumatic controllers at production facilities and presumably at natural gas compressor stations, the bleed rate must be less than or equal to 6 scfh unless demonstrated that a greater bleed rate is required. For pneumatic controllers at processing plants, the bleed rate must be zero.

For reciprocating compressors at natural gas compressor stations and similar facilities, designed to be driven by an engine or motor less than or equal to 3,800 horsepower, VOC emissions shall not exceed 0.22 tons per month averaged over a 12-month rolling period. Either capture emissions from the rod end packing, compressor isolation valves, and compressor blowdown vents and route to a flare designed for 95% destruction efficiency or route emissions from a high-pressure line to a low-pressure line prior to venting such that at least 90% of the gasses are recovered. Alternatively, replace the rod end packing every 26,000 hours of operation or within 3 years.

For fugitive emissions components at production facilities, quarterly LDAR inspections are required. The inspections can be reduced to semiannually after four consecutive quarterly inspections with less than 2% of leaking components. The inspections can be reduced to annually after two consecutive semiannual inspections less than 2% of leaking components. VOC emissions from fugitive equipment leaks shall not exceed 10.56 TPY. A leak is any visible emission detected with a FLIR camera or emissions greater than or equal to 10,000 ppm for pressure-relief devices and valves in light liquid/gas/vapor service, pumps in light liquid service, connectors and other equipment; greater than or equal to 500 ppm for compressors and closed vent systems. First attempt at repair must be completed within 5 days with the full repair completed within 30 calendar days. Delay of repair is in accordance with 40 CFR § 60.5416(c)(5).

For fugitive emissions at natural gas compressor stations and similar facilities, quarterly LDAR inspections are required. VOC emissions from fugitive equipment leaks shall not exceed 10 TPY. A leak is any visible emission detected with a FLIR camera or emissions greater than or equal to 10,000 ppm for pressure-relief devices in light liquid service and other equipment, greater than or equal to 2,000 ppm for pumps in light liquid service; greater than or equal to 500 ppm for pressure-relief devices in

¹⁴ Ohio EPA, Early Stakeholder Outreach—New Rules Regulating Emissions from the Oil and Gas Industry, November 2018, https://www.epa.ohio.gov/Portals/27/regs/3745-31/ESO_NewOilandGasRules_2018.pdf.

gas/vapor service, valves in light liquid/gas/vapor service, compressors, connectors, closed vent systems, and intermittent snap-action controllers. Repair must be completed as soon as practicable, but no later than 30 calendar days. Delay of repair is in accordance with 40 CFR § 60.5416(c)(5).

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

On November 8, 2018, the New York State Department of Environmental Conservation (NYSDEC) announced the development of a stakeholder regulation outline and is seeking public comment on a potential rulemaking for new requirements in the oil and natural gas sector.¹⁵

For storage vessels with PTE greater than or equal to 6 TPY VOC, there may be no venting to the atmosphere and VOC and methane emissions must be reduced by 95%. NYSDEC is considering a PTE threshold for methane.

For natural gas-driven pneumatic controllers, bleed rate must be less than or equal to 6 scfh. For natural gas-driven diaphragm pumps, emissions must be routed to onsite control system with 95% control efficiency.

For reciprocating compressors at natural gas infrastructure sites, rod end packing must be replaced on or before 26,000 hours of operation or 36 months. Compressors shall be designed so that no gas from a compressor blowdown vents to the atmosphere by either routing the gasses to a vapor recovery system, a combustion device or another technology.

For wet seal centrifugal compressors at natural gas infrastructure sites, VOC and methane emissions must be reduced by 95% or the wet seal must be replaced with a dry seal. Compressors shall be designed so that no gas from a compressor blowdown vents to the atmosphere by either routing the gasses to a vapor recovery system, a combustion device or another technology.

For fugitive emissions components, quarterly LDAR inspections are required using OGI or Method 21. NYSDEC may include an innovative technology/alternative compliance pathway to address continuously improving leak detection technology. NYSDEC is considering requiring LDAR at metering and regulating stations. The OGI leak definition is any visible emission. The Method 21 leak definition is 500 ppm. Leaking equipment must be repaired or replaced within 5 to 30 days of discovery unless it is a critical component. Repaired or replaced components must be resurveyed within 15 days. Critical components must minimize emissions within 1 day and be repaired by the end of the next process shutdown or within 12 months, whichever is sooner.

It should be noted that New York has had a high-volume hydraulic fracturing ban in place since 2012.

MARYLAND DEPARTMENT OF THE ENVIRONMENT

The Maryland Department of the Environment (MDE) is proposing to create a methane rule in two phases for the control of sources in the oil and natural gas industry.¹⁶ The first phase is the transmission sector and will have the following proposed requirements:

¹⁵ NYSDEC, Oil and Natural Gas Sector Emissions in New York Stakeholder Regulation Outline, November 2018, https://www.dec.ny.gov/docs/air_pdf/oilgasoutline.pdf.

¹⁶ MDE, Minimizing Methane Emissions from Natural Gas Compressor Stations and other Related Equipment, March 6, 2019, <https://mde.maryland.gov/programs/Regulations/air/Documents/StakeholderPresentation03062019.pdf>.

For natural gas-driven pneumatic controllers, the bleed rate cannot exceed 6 scfh. Beginning January 1, 2022, controllers must be electric, compressed air or use vapor collection. MDE will require LDAR inspections.

For reciprocating compressors, the rod packing flow rate must be measured annually and repaired if the flow rate exceeds the standard or the combined flow rate equal to the number of cylinders times the standard. Currently a standard between 0.51 to 2 scfm is being proposed. Alternatively, emissions can be routed to a vapor control device and utilized.

For fugitive emissions components, quarterly LDAR inspections using OGI or Method 21 are proposed. Repairs must be made and certified within 30 calendar days. Delay of repair is authorized for ordering parts, with repair completed within 7 calendar days of receipt of parts; if repair is infeasible, requires a vent or compressor station blowdown or is unsafe to repair during operation, repair must be completed during the next planned shutdown or vent blowdown.

The second phase is the production sector; however, Maryland only has 10 active wells and has had a hydraulic fracturing ban in place since 2017.

COMPARISON OF THIS PROPOSED RULEMAKING WITH REGULATIONS IN OTHER STATES

This proposed rulemaking is less stringent than CARB's methane requirements; however, it is more stringent than CARB's LDAR requirements as the quarterly instrument-based inspections have a leak definition of 500 ppm as methane for all types of components, with no allowances for number or size of leaks as in the CARB program. The LDAR requirements of this proposed rulemaking are more stringent than both SCAQMD's and SJVAPCD's LDAR requirements as they have allowable numbers of leaks based on the detected concentration.

Additionally, this proposed rulemaking is more stringent than Colorado's regulations regarding LDAR as Colorado has a frequency requirement based upon the facilities VOC emissions, although in ozone nonattainment areas, the frequency is quarterly. The frequency requirement for this proposed rulemaking is quarterly for all facilities, with well sites having less than 2% of components leaking in two consecutive LDAR inspections eligible to reduce instrument-based inspections to semiannually. For natural gas-driven pneumatic controllers and diaphragm pumps, reciprocating compressors, and centrifugal compressor wet seal degassing systems, Colorado's regulations and this proposed rulemaking are identical. The storage vessel requirements in Colorado are slightly more stringent than this proposed rulemaking in that the VOC emission threshold is 2 tpy in ozone nonattainment areas, although the control efficiency required is lower than in this proposed rulemaking at well sites (90% from May to September and 70% from October to April). In the rest of the state, the Colorado requirement is for a 98% reduction for combustion control devices installed on or after May 1, 2014. This proposed rulemaking requires a 95% reduction to maintain consistency with the requirements in the Department's general permits. However, the manufacturer-tested models typically achieve significantly greater than 95% control in practice.

This proposed rulemaking is more stringent than Montana's regulations for storage vessels as the threshold is less than Montana's 15 tpy PTE VOC required control. This proposed rulemaking is also more stringent than Montana's regulations for fugitive emissions as Montana only requires monthly AVO inspections.

This proposed rulemaking's requirements for storage vessels are more stringent than the proposal offered by Ohio based on the TPY threshold. Ohio is proposing a 2.64 TPY VOC emission limit for reciprocating compressors, however the other requirements are identical to this proposed rulemaking. Ohio is also proposing emission limits for fugitive emissions components of 10.56 TPY VOC at well sites and of 10 TPY VOC at natural gas compressor stations and similar facilities. The frequencies are the same as for this proposed rulemaking, except that well sites are eligible to further reduce the instrument-based inspection frequency to annually after two semiannual inspections having less than 2% of leaking components.

New York's proposal is similar to this proposed rulemaking, except that for reciprocating and centrifugal compressor blowdown vents, the emissions must be routed to a vapor recovery system, a control device, or another technology. Additionally, Maryland's proposal is similar to this proposed rulemaking for instrument-based LDAR, although the repair and certification of the repair is within 30 days; it is not clear if there is an AVO inspection requirement at this time.

Lastly, this proposed rulemaking will provide consistency among all oil and natural gas sources, new and existing, in this Commonwealth for monitoring fugitive emissions components by including monthly AVO inspection requirements and quarterly LDAR inspection requirements. These requirements are consistent with the LDAR requirements specified in the Department's GP-5, GP-5A, and Exemption 38. This proposed rulemaking is also consistent with the 2016 O&G CTG, which many states are using as a template for their existing source regulations. This consistency will ensure that this Commonwealth will not be at a competitive disadvantage.

(13) Will the regulation affect any other regulations of the promulgating agency or other state agencies? If yes, explain and provide specific citations.

No other regulations are affected by this proposed rulemaking.

(14) Describe the communications with and solicitation of input from the public, any advisory council/group, small businesses and groups representing small businesses in the development and drafting of the regulation. List the specific persons and/or groups who were involved. ("Small business" is defined in Section 3 of the Regulatory Review Act, Act 76 of 2012.)

The Department consulted with the Air Quality Technical Advisory Committee (AQTAC) and the Small Business Compliance Advisory Committee (SBCAC) in the development of this proposed rulemaking. On December 14, 2017, the Department presented concepts to AQTAC on a potential rulemaking incorporating the 2016 O&G CTG recommendations. The Department returned to AQTAC on December 13, 2018 for an informational presentation on a preliminary draft Annex A. This proposed rulemaking was presented for a vote to AQTAC on April 11, 2019 and SBCAC on April 17, 2019. Both committees concurred with the Department's recommendation to move this proposed rulemaking forward to the Board for consideration.

On January 24, 2019, the Department updated the Department of Community and Economic Development's Pa Grade Crude Development Advisory Council on the status of this proposed rulemaking. On March 21, 2019, the Department provided an informational presentation to the Oil and Gas Technical Advisory Board. The Department also conferred with the Citizens Advisory Council's (CAC) Policy and Regulatory Oversight Committee concerning this proposed rulemaking on May 7,

2019. On June 18, 2019, the full CAC concurred with the Department's recommendation to move this proposed rulemaking forward to the Board for consideration.

The Department has also met with industry and environmental stakeholders to receive additional input on this proposed rulemaking. On July 8, 2019, the Department met with industry stakeholders, including representatives from the Marcellus Shale Coalition, Penn Energy, Southwestern Energy, Range Resources, and Chesapeake Energy. On August 27, 2019, the Department met with environmental stakeholders, including representatives from PennFuture, Environmental Defense Fund, and the Clean Air Council.

(15) Identify the types and number of persons, businesses, small businesses (as defined in Section 3 of the Regulatory Review Act, Act 76 of 2012) and organizations which will be affected by the regulation. How are they affected?

The Department's databases, including the Environmental Facility Application Compliance Tracking System (eFACTS), and Air Information Management System (AIMS), were reviewed to gather information about potentially affected facilities.

The EPA's 2016 O&G CTG listed the following five North American Industry Classification System (NAICS) codes to identify businesses potentially covered by the 2016 O&G CTG. The NAICS is an industry classification system developed by Canada, Mexico and the United States that groups establishments into industry groups based on the economic activities, producing and nonproducing, in which the establishment is primarily engaged.

The types of persons, businesses, small businesses and organizations in this Commonwealth that would be affected by this proposed rulemaking are the same as identified by the EPA:

1. 211111 Crude Petroleum and Natural Gas Extraction.
2. 211112 Natural Gas Liquid Extraction.
3. 221210 Natural Gas Distribution.
4. 486110 Pipeline Distribution of Crude Oil.
5. 486210 Pipeline Transportation of Natural Gas.

In 2017, these five NAICS codes were changed to the following codes with potentially affected sources, which should not affect the scope of sources affected in this Commonwealth:

1. 211120 Crude Petroleum Extraction.
2. 211130 Natural Gas Extraction.
3. 221210 Natural Gas Distribution.
4. 486110 Pipeline Distribution of Crude Oil.
5. 486210 Pipeline Transportation of Natural Gas.

There are also two additional NAICS codes in the oil and natural gas industry that report emissions to the Department's Air Emission Inventory:

1. 213111 Drilling Oil and Gas Wells.
2. 486990 All Other Pipeline Transportation.

The Small Business Administration (SBA) has established definitions of what constitutes a small business concern and publishes a list of size standards for each NAICS code. See 13 CFR § 121.201. The size standard, usually stated in number of employees or average annual receipts, represents the largest size that a business (including its subsidiaries and affiliates) may be to remain classified as a small business for SBA and Federal government programs. For crude petroleum extraction (211120) and natural gas extraction (211130), the SBA size definition is 1,250 employees. For natural gas distribution (221210) and drilling oil and gas wells (213111), the SBA size definition is 1,000 employees. For pipeline distribution of crude oil (486110), the SBA size definition is 1,500 employees. For pipeline transportation of natural gas (486210), the SBA size definition is \$30 million in annual receipts. For all other pipeline transportation (486990), the SBA size definition is \$40.5 million in annual receipts.

It is likely that this proposed rulemaking would have some impact on small businesses if they are owners or operators of existing facilities that were previously exempt from permitting that would be required to comply with this proposed rulemaking.

Summary

The Department identified 5,039 client ID numbers for owners or operators of facilities in this Commonwealth using the Department's eFACTS database and the NAICS codes covered by the 2016 O&G CTG. These facilities include approximately 89,320 conventional and unconventional oil and natural gas wells, of which the Department estimates that 8,403 unconventional wells and 71,229 conventional wells are currently in production. These facilities also include approximately 435 midstream compressor stations, 120 transmission compressor stations and 10 natural gas processing facilities in this Commonwealth.

The Department categorized the owners and operators based on their client type in eFACTS and makes the base assumption that those with an association/organization, authority, county, estate/trust, federal agency, individual, municipality, government, non-government, partnership-general, partnership-limited, school district, sole proprietorship, or state agency client types are assumed to be a small business. The Department determined that those with a client type of limited liability company, limited liability partnership, non-Pennsylvania corporation, or Pennsylvania corporation are not small businesses unless they meet the required SBA size definition. At this time, the Department estimates that 60 owners or operators meet the SBA size definition for small business based on information found in the Hoover's database for 118 of the 1,170 owners or operators. Based on these criteria to date, 3,929 of the 5,039 owners or operators may meet the definition of small business as defined in Section 3 of the Regulatory Review Act. See 71 P.S. § 745.3. All of these owners and operators across this Commonwealth would potentially be subject to this proposed rulemaking.

Some of the affected facility owners and operators are already required to meet requirements under 40 CFR Part 60, Subparts OOOO and OOOOa and therefore are meeting most of the proposed requirements of this proposed rulemaking. In addition, it is estimated that approximately 99.4% of conventional wells and 9% of unconventional wells meet the low production threshold and would not be required to conduct LDAR.

The Department expects the impact of the requirements of this proposed rulemaking on affected owners and operators, including small businesses, would likely incur a cost benefit or incur little, if any, cost to implement the requirements of this proposed rulemaking. Additionally, the \$35.3 million per year compliance cost listed in question 17 is industry wide, as is the \$9.9 million per year in gas savings. When spread across the 5,039 clients, the average cost per client is \$7,005. This average of course will

be at times higher or lower for an individual client, as will be the amount of gas savings so that it is possible for an individual client to see a cost benefit. Ultimately, this proposed rulemaking will help facilities conserve the valuable product that they sell which helps offset any cost of this proposed rulemaking. The table in question 23 provides a breakdown of the cost data for the industry.

(16) List the persons, groups or entities, including small businesses, that will be required to comply with the regulation. Approximate the number that will be required to comply.

This proposed rulemaking would apply statewide to owners and operators of one or more of the following oil and natural gas sources of VOC emissions which were in existence on or before the effective date of this rulemaking: storage vessels in all segments except natural gas distribution, natural gas-driven pneumatic controllers, natural gas-driven diaphragm pumps, centrifugal compressors and reciprocating compressors, and fugitive emission components.

The Department identified 5,039 client ID numbers for owners or operators of facilities in this Commonwealth using the Department's eFACTS database and the NAICS codes covered by the 2016 O&G CTG. These facilities include approximately 89,320 conventional and unconventional oil and natural gas wells, of which the Department estimates that 8,403 unconventional wells and 71,231 conventional wells are currently in production. These facilities also include approximately 435 midstream compressor stations, 120 transmission compressor stations and 10 natural gas processing facilities in this Commonwealth.

The Department estimates that approximately 21 storage vessels, 28,348 pneumatic controllers, and 1,164 pneumatic pumps will have requirements under the proposed rulemaking. Approximately 199 conventional wells and 4,913 unconventional well will be required to implement LDAR or increase the current LDAR frequency under this proposed rulemaking. Approximately 278 midstream compressor stations and 5 processing plants will be required to implement LDAR or meet new requirements under this proposed rulemaking.

Based on the analysis in question 15, approximately 3,929 of the 5,039 owners or operators may meet the definition of small business as defined in Section 3 of the Regulatory Review Act. See 71 P.S. § 745.3. Further analysis is required to determine if any of the affected sources are owned or operated by small businesses.

(17) Identify the financial, economic and social impact of the regulation on individuals, small businesses, businesses and labor communities and other public and private organizations. Evaluate the benefits expected as a result of the regulation.

This proposed rulemaking would apply statewide to owners and operators of one or more of the following oil and natural gas sources of VOC emissions which were in existence on or before the effective date of this rulemaking: storage vessels in all segments except natural gas distribution, natural gas-driven pneumatic controllers, natural gas-driven diaphragm pumps, centrifugal compressors and reciprocating compressors, and fugitive emission components.

The Department estimates that the cost of complying with this proposed rulemaking would be about \$35.3 million per year. However, implementation of the proposed control measures would also potentially save the oil and natural gas industry about \$9.9 million per year due to a lower natural gas loss rate during production. This estimate consists of two major categories of data. The first is the cost per year for each piece of equipment or site affected. This number was provided by the EPA in the 2016

O&G CTG. The second is the number of potentially affected facilities, which was obtained from several data sources including the Department's database for oil and gas well production, the Department's air emissions inventory, the eFACTS and AIMS databases, the United States Energy Information Agency's list of natural gas processing plants, and the EPA emissions inventory.

Of the 71,229 conventional wells reporting production, only 303 are above the 15 barrel of oil equivalent per day (boe/day) production threshold as reported in the Department's 2017 oil and gas production database and will have fugitive emissions component requirements. For sources located at a natural gas well site, the anticipated cost to comply with the requirements would be based on the sources present at the site, the applicability of those sources and the type of control used to comply. In the 2016 O&G CTG, the EPA estimates the costs for control of the various sources as follows:

- Implementation of a quarterly LDAR program using OGI costs \$4,220 per year resulting in a cost per ton of VOC reduced of \$3,453.
- Routing emissions from a natural gas-driven diaphragm pump to a process costs \$774 per year resulting in a cost per ton of VOC reduced of \$847.
- Replacing a continuous high-bleed natural gas-driven pneumatic controller costs \$296 per year resulting in a cost per ton of VOC reduced of \$209.
- Routing emissions from a storage vessel to a control device costs \$25,194 per year with a cost per ton of VOC reduced of \$4,420.

Most of the anticipated costs are due to new regulatory requirements but many of the costs associated with this proposed rulemaking are from common sense practices and controls that operators are already implementing. Some examples include periodic inspections which can prevent releases which in turn prevents environmental damage and significant financial losses for the operator. The Department anticipates there will be areas of cost savings that will occur as a result of this proposed rulemaking as well. In addition, the Department estimates that some small business stationary sources may be below the applicability thresholds. However, affected small businesses may incur minimal cost as a result of this proposed rulemaking. Overall, the Department does not anticipate that this proposed rulemaking will result in any significant adverse impact on small oil and gas operators.

The Department estimates that implementation of the proposed control measures could reduce VOC emissions by as much as 983 TPY from fugitive emissions components through the performance of quarterly LDAR inspections, by as much as 121 TPY from the installation of controls for storage vessels with actual emissions based on the Department's more stringent applicability thresholds, 109 TPY from pneumatic pumps and 3,191 TPY from pneumatic controllers. Approximately 294 TPY of these emission reductions are due to the additional stringency the Department proposes when compared to the 2016 O&G CTG. These reductions would benefit the health and welfare of the approximately 12.8 million residents and the numerous animals, crops, vegetation and natural areas of this Commonwealth by reducing the amount of ground-level ozone air pollution resulting from these sources.

In addition, this proposed rulemaking is consistent with Governor Wolf's strategy to reduce emissions of methane from the oil and natural gas industry in this Commonwealth. Methane is a potent greenhouse gas with a global warming potential more than 28 times that of carbon dioxide over a 100-year time period, according to the EPA. The EPA has identified methane, the primary component of natural gas, as the second-most prevalent greenhouse gas emitted in the United States from human activities. According to federal estimates, the natural gas and oil industries account for a quarter of United States methane emissions. In addition to climate change impacts, methane and VOC emissions have harmful

effects on air quality and human health. Thus, reducing methane leaks from oil and natural gas sources is essential to reducing global greenhouse gas emissions and protecting public health.

While this proposed rulemaking requires VOC emission reductions, methane emissions are also reduced as a co-benefit, because both VOCs and methane are emitted from oil and gas operations. Except for storage vessels, the requirements for control of emissions are not dependent on an applicability threshold for VOCs, meaning that most requirements have no minimum level of VOC emissions under which sources are granted an exemption. The control measures implemented for VOC emissions simultaneously control methane emissions and could reduce methane emissions by as much as 11,582 TPY from fugitive emissions components through the performance of quarterly LDAR inspections, by as much as 17 TPY from the installation of controls for storage vessels with actual emissions based on the Department's more stringent applicability thresholds, 2,583 TPY from pneumatic pumps, and 61,421 TPY from pneumatic controllers. Approximately 2,627 TPY of these emission reductions are due to the additional stringency the Department proposes when compared to the 2016 O&G CTG.

Adoption of the VOC emission control measures and other requirements in this proposed rulemaking would allow the Commonwealth to make substantial progress in achieving and maintaining the 1997, 2008 and 2015 8-hour ozone NAAQS statewide. Implementation of and compliance with the proposed VOC emission reduction measures would also assist the Commonwealth in reducing the levels of ozone precursor emissions that contribute to potential nonattainment of the 2015 ozone NAAQS. As a result, the VOC emission control measures are reasonably necessary to attain and maintain the health-based and welfare-based 8-hour ozone NAAQS in this Commonwealth and to satisfy related CAA requirements.

Repeated exposure to ozone pollution for both healthy people and those with existing conditions may cause a variety of adverse health effects including difficulty breathing, chest pains, coughing, nausea, throat irritation, and congestion. In addition, people with bronchitis, heart disease, emphysema, asthma, and reduced lung capacity may have their symptoms exacerbated by ozone pollution. Asthma is a significant and growing threat to children and adults in this Commonwealth. Reduced ambient concentrations of ground-level ozone would reduce the incidences of hospital admissions for respiratory ailments including asthma and improve the quality of life for citizens overall. High levels of ground-level ozone also affect animals including pets, livestock, and wildlife, in ways similar to humans. Reduced ambient concentrations of ground-level ozone would improve the quality of life of animals, preserve this Commonwealth's biodiversity, and reduce veterinary costs to farmers and citizens with pets.

In addition to causing adverse human and animal health effects, high levels of ground-level ozone affect vegetation and ecosystems, leading to reductions in agricultural crop and commercial forest yields by destroying chlorophyll; reduced growth and survivability of tree seedlings; and increased plant susceptibility to disease, pests, and other environmental stresses, including harsh weather. In long-lived species, these effects may become evident only after several years or even decades and have the potential for long-term adverse impacts on forest ecosystems.

(18) Explain how the benefits of the regulation outweigh any cost and adverse effects.

VOCs are precursors to the formation of ground-level ozone, a public health and welfare hazard. Ground-level ozone is not emitted directly to the atmosphere from oil and natural gas sources but is formed by a photochemical reaction between emissions of VOCs and NO_x in the presence of sunlight. Ground-level ozone is a highly reactive gas, which at sufficiently high concentrations can produce a wide variety of effects harmful to public health and welfare. Additionally, climate change may exacerbate the

need to address ground-level ozone. According to the EPA, atmospheric warming, as a result of climate change, may increase ground-level ozone in regions across the United States. This impact could also be an issue for states trying to comply with future ozone standards.

Ozone is an irritant and repeated exposure to ozone pollution for both healthy people and those with existing conditions may cause a variety of adverse health effects, including difficulty in breathing, chest pains, coughing, nausea, throat irritation, and congestion. In addition, people with bronchitis, heart disease, emphysema, asthma, and reduced lung capacity may have their symptoms exacerbated by ozone pollution. Asthma, in particular, is a significant and growing threat to children and adults in this Commonwealth. Ozone can also cause both physical and economic damage to important food crops, forests, and wildlife, as well as materials such as rubber and plastics. The implementation of additional measures to address ozone air quality in this Commonwealth is necessary to protect the public health and welfare and the environment. Because VOCs are precursors for ground-level ozone formation, implementing the RACT recommendations of the 2016 O&G CTG will help the Commonwealth achieve and maintain the 1997, 2008, and 2015 ozone NAAQS.

While this proposed rulemaking requires VOC emission reductions, methane emissions are also reduced as a co-benefit, because both VOCs and methane are emitted from oil and gas operations. Except for storage vessels, the requirements for control of emissions are not dependent on an applicability threshold for VOCs, meaning that most requirements have no minimum level of VOC emissions under which sources are granted an exemption. For example, continuous bleed natural gas-driven pneumatic controllers are required to limit their bleed rate to 6 scf per hour of natural gas, regardless of the VOC concentration, which also serves to limit methane emissions. Reciprocating compressors at gathering and boosting stations and natural gas processing plants are required to replace the rod end packing or route the rod end packing emissions to a closed vent system regardless of the actual VOC emissions, which serves to reduce both VOC and methane emissions by limiting natural gas leakage. Both wet seal centrifugal compressor degassing systems and natural gas-driven diaphragm pumps are required to control their VOC emissions by 95% regardless of the actual VOC emissions, which also effectively controls methane emissions. Also, for fugitive emissions components, the AVO inspection program and LDAR program detect natural gas leakage, which, with the repair requirement, serves to reduce both emissions of VOC and methane. As detailed in question 17, the above control measures implemented for VOC emissions simultaneously control methane emissions and provide VOC emission reductions of approximately 4,404 TPY and methane emission reductions of approximately 75,603 TPY. The additional stringency in this proposed rulemaking results in a greater reduction of VOC and methane emissions than the 2016 O&G CTG, amounting to 294 TPY of VOCs and 2,627 TPY of methane.

Ozone precursor emission reductions achieved through the implementation of RACT requirements and RACT emission limitations for the affected sources would help the Commonwealth attain and maintain the 1997, 2008 and 2015 ozone NAAQS. Given that implementation of RACT requirements is federally required, the Department estimates that the proposed RACT requirements and RACT emission limitations would achieve greater VOC emission reductions at a reasonable cost to the affected owners and operators and to the Commonwealth than not implementing this proposed rulemaking.

Although this proposed rulemaking is designed primarily to address ground-level ozone air quality, there would also likely be reductions in methane emissions which would result in other health and environmental benefits. The improvements in ground-level ozone air quality and groundwater quality through reduced emissions of VOCs would provide economic and social benefits through reduced need for medical treatment for asthma and other lung-related illnesses and reduced costs for repairing damage

to infrastructure, as well as through improved crop yields, healthier forests and wildlife, and increased tourism to see the beautiful natural areas of this Commonwealth.

This proposed rulemaking may create economic opportunities for VOC emission control technology innovators, manufacturers, and distributors through an increased demand for new or improved equipment. In addition, the owners and operators of regulated facilities may be required to install and operate an emissions monitoring system or equipment necessary for an emissions monitoring method to comply with the rulemaking, thereby creating an economic opportunity for the emissions monitoring industry.

This proposed rulemaking will provide consistency among all oil and natural gas sources in Pennsylvania for monitoring fugitive emissions components by including monthly AVO inspection requirements and quarterly LDAR inspection requirements. These requirements are consistent with the LDAR requirements specified in the Department's GP-5, GP-5A, and Exemption 38. This would have the benefit of providing owners and operators of both new and existing facilities with the ability to merge both types of sources into one LDAR program. This would also benefit the Department in ensuring compliance of these sources.

(19) Provide a specific estimate of the costs and/or savings to the regulated community associated with compliance, including any legal, accounting or consulting procedures which may be required. Explain how the dollar estimates were derived.

Compliance costs will vary for each facility depending on which compliance option is chosen by the owner or operator. For storage vessels, installing an enclosed combustion device will cost \$25,194 per year and installing a vapor recovery unit will cost \$32,006 per year. For pneumatic controllers, installing a pneumatic controller that utilizes instrument air when an instrument air system is already on-site costs \$285 per year. Replacing a controller with a low bleed continuous controller costs \$296 per year. Routing a diaphragm pump to a process costs \$774 per year. Replacing the rod end packings on a reciprocating compressor at a gathering and boosting station costs \$2,153 per year; at a processing plant the costs is \$1,631 per year. Routing the wet seal centrifugal compressor degassing system to a process costs \$2,553 per year. Conducting quarterly LDAR with OGI at a well site costs \$4,220 and at a gathering and boosting station \$25,049 per year. Conducting a Method 21, 40 CFR Part 60, Subpart VVa (relating to standards of performance for equipment leaks of VOC in the synthetic organic chemicals manufacturing industry for which construction, reconstruction, or modification commenced after November 7, 2006) inspection at a processing plant costs \$12,959. The Department assumes that using the OGI alternative method for EPA Method 21 at a processing plant costs \$25,049 per year for a gathering and boosting station.

Based on the above compliance costs, and the number of applicable sources, the Department estimates that this proposed rulemaking will cost operators approximately \$35.3 million (based on 2012 dollars) without consideration of the economic benefit of the saved natural gas. The value of the saved natural gas, in 2012 dollars, yields a savings of approximately \$9.9 million, resulting in a total net cost of \$25.4 million for this proposed rulemaking.

This estimate consists of two major categories of data. The first is the cost per year for each piece of equipment or site affected. This number was provided in the 2016 O&G CTG. The second is the number of potentially affected facilities was obtained from several data sources including the Department's O&G database for oil and gas well production, the Department's air emissions inventory, the eFACTS and AIMS databases, the United States Energy Information Agency's list of natural gas processing plants, and the EPA emissions inventory. With these values the cost per site or piece of

equipment was multiplied by the number of each in the state. These values were added together for each category of equipment to come up with a final estimated cost and savings.

If the owner or operator cannot meet the provisions of this proposed rulemaking, then they must demonstrate to the Department's satisfaction that it is economically or technically infeasible to meet the applicable proposed VOC RACT emission limitation in a case-by-case RACT permit application. This may minimize compliance costs to the owner or operator of an affected facility.

The VOC RACT requirements established by this proposed rulemaking will not require the owner or operator to submit an application for amendments to an existing operating permit. These requirements will be incorporated when the permit is renewed, if less than 3 years remain in the permit term, as specified under § 127.463(c) (relating to operating permit revisions to incorporate applicable standards). If 3 years or more remain in the permit term, the requirements would be incorporated as applicable requirements in the permit within 18 months of the promulgation of the final-form rulemaking, as required under § 127.463(b).

(20) Provide a specific estimate of the costs and/or savings to the local governments associated with compliance, including any legal, accounting or consulting procedures which may be required. Explain how the dollar estimates were derived.

It is not anticipated that any additional costs to local governments will be incurred as a result of this proposed rulemaking.

(21) Provide a specific estimate of the costs and/or savings to the state government associated with the implementation of the regulation, including any legal, accounting, or consulting procedures which may be required. Explain how the dollar estimates were derived.

State government costs would include permit engineer review time for applications of plan approvals or operating permits as a result of any modifications or additions of infrastructure at oil and natural gas facilities required to comply with this proposed rulemaking. Revenue to state government and the Department would be generated from the fees associated with applications submitted. It is anticipated that any cost to the Commonwealth will be offset by the revenue generated.

(22) For each of the groups and entities identified in items (19)-(21) above, submit a statement of legal, accounting or consulting procedures and additional reporting, recordkeeping or other paperwork, including copies of forms or reports, which will be required for implementation of the regulation and an explanation of measures which have been taken to minimize these requirements.

(22a) Are forms required for implementation of the regulation?

No new legal, accounting or consulting procedures are contained in this proposed rulemaking. No new forms would be required for the implementation of this proposed rulemaking. Forms needed to implement this proposed rulemaking exist and are currently part of the Air Quality program. The recordkeeping and reporting requirements for owners and operators of applicable sources under this proposed rulemaking are minimal because the records required are in line with the records already required to be kept for emission inventory purposes and for other federal and state requirements. To minimize the burden of these requirements, the Department allows electronic submission of most planning, reporting and recordkeeping forms required by this proposed rulemaking.

(22b) If forms are required for implementation of the regulation, attach copies of the forms here. If your agency uses electronic forms, provide links to each form or a detailed description of the information required to be reported. Failure to attach forms, provide links, or provide a detailed description of the information to be reported will constitute a faulty delivery of the regulation.

N/A because no new forms would be required for the implementation of this proposed rulemaking.

(23) In the table below, provide an estimate of the fiscal savings and costs associated with implementation and compliance for the regulated community, local government, and state government for the current year and five subsequent years.

| | Current FY Year (19/20) | FY+1 Year (20/21) | FY+2 Year (21/22) | FY+3 Year (22/23) | FY+4 Year (23/24) | FY+5 Year (24/25) |
|---------------------------------|--|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| SAVINGS: | \$ | \$ | \$ | \$ | \$ | \$ |
| Regulated Community | 9,938,788 | 10,137,564 | 10,340,315 | 10,547,121 | 10,758,064 | 10,973,225 |
| Local Government | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| State Government | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total Savings | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| COSTS: | | | | | | |
| Regulated Community | 35,290,082 | 35,995,884 | 36,715,801 | 37,450,117 | 38,199,120 | 38,963,102 |
| Local Government | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| State Government | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total Costs | | | | | | |
| REVENUE LOSSES: | | | | | | |
| Regulated Community | 25,351,294 | 25,858,320 | 26,375,486 | 26,902,996 | 27,441,056 | 27,989,877 |
| Local Government | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| State Government | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total Revenue Losses | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

(23a) Provide the past three-year expenditure history for programs affected by the regulation.

| Program | FY-3 (16/17) | FY-2 (17/18) | FY-1 (18/19) | Current FY (19/20) |
|---|-------------------------|-------------------------|-------------------------|-------------------------------|
| Environmental Program Management (161-10382) | \$26,885,000 | \$29,413,000 | \$30,932,000 | \$28,420,000 |
| Clean Air Fund Major Emission Facilities (215-20077) | \$16,931,000 | \$17,480,000 | \$16,067,000 | \$17,878,000 |
| Clean Air Fund Mobile and Area Facilities (233-20084) | \$8,228,000 | \$8,727,000 | \$7,205,000 | \$9,369,000 |

(24) For any regulation that may have an adverse impact on small businesses (as defined in Section 3 of the Regulatory Review Act, Act 76 of 2012), provide an economic impact statement that includes the following:

(a) An identification and estimate of the number of small businesses subject to the regulation.

The Department expects the requirements of this proposed rulemaking on affected owners and operators, including small businesses to incur few costs, and in some cases may incur a cost benefit based on recovered natural gas. Of the 5,039 client IDs from the eFACTS database, approximately 3,929 may meet the definition of small business as defined in Section 3 of the Regulatory Review Act. Out of the 3,929 client IDs, approximately 60 owners or operators meet the SBA size definition of small business based on the information found in the Hoover's database.

(b) The projected reporting, recordkeeping and other administrative costs required for compliance with the proposed regulation, including the type of professional skills necessary for preparation of the report or record.

The recordkeeping and reporting requirements for owners and operators of applicable sources under this proposed rulemaking are minimal because the records required are in line with the records already required to be kept for emission inventory purposes and for other federal and state requirements.

Some of the affected facility owners and operators are already required to meet requirements under 40 CFR Part 60, Subparts OOOO and OOOOa. Sources installed prior to September 18, 2015, would be required to keep records and submit reports to show compliance with this proposed rulemaking. No special skills are required, and the Department only anticipates minimal administrative costs.

For sources installed after August 23, 2011, no new reporting, recordkeeping, and other administrative procedures are required in this proposed rulemaking for small businesses. The owners and operators of affected facilities are familiar with the existing requirements for reporting and recordkeeping for their industry and have the professional and technical skills needed for compliance with these proposed requirements. No special skills are required, and the Department only anticipates minimal costs.

The Department plans to educate and assist the public and the regulated community in understanding the proposed requirements and how to comply with them.

(c) A statement of probable effect on impacted small businesses.

Of the 71,229 conventional wells reporting production, only 303 are above the 15 boe/day production threshold as reported in the Department's 2017 oil and gas production database and will have fugitive emissions component requirements. For sources located at a natural gas well site, the anticipated cost to comply with the requirements would be based on the sources present at the site, the applicability of those sources and the type of control used to comply. In the 2016 O&G CTG, the EPA estimates the costs for control of the various sources as follows:

- Implementation of a quarterly LDAR program using OGI costs \$4,220 per year resulting in a cost per ton of VOC reduced of \$3,453.
- Routing emissions from a natural gas-driven diaphragm pump to a process costs \$774 per year resulting in a cost per ton of VOC reduced of \$847.
- Replacing a continuous high-bleed natural gas-driven pneumatic controller costs \$296 per year resulting in a cost per ton of VOC reduced of \$209.
- Routing emissions from a storage vessel to a control device costs \$25,194 per year with a cost per ton of VOC reduced of \$4,420.

Most of the anticipated costs are due to new regulatory requirements but many of the costs associated with this rule are from what the Department believes to be common sense practices and controls that operators are already implementing. Some examples include periodic inspection which can prevent releases which in turn prevents environmental damage and significant financial losses for the operator. The Department anticipates there will be areas of cost savings that will occur as a result of this proposed rulemaking as well. In addition, the Department estimates most small business stationary sources will be below the applicability thresholds. However, affected small businesses may incur minimal cost as a result of this proposed rulemaking. Overall, the Department does not anticipate that this proposed rulemaking will result in any significant adverse impact on small oil and gas operators.

The Department plans to educate and assist the public and the regulated community in understanding the proposed requirements and how to comply with them. The Department will continue to work with the Department's provider of Small Business Stationary Source Technical and Environmental Compliance Assistance. These services are currently provided by the Environmental Management Assistance Program (EMAP) of the Pennsylvania Small Business Development Centers. The Department has partnered with EMAP to fulfill the Department's obligation to provide confidential technical and compliance assistance to small businesses as required by the APCA, Section 507 of the CAA (42 U.S.C.A. § 7661f) and authorized by the Pennsylvania Small Business and Household Pollution Prevention Program Act (35 P.S. §§ 6029.201—6029.209). In addition to providing one-on-one consulting assistance and on-site assessments, EMAP also operates a toll-free phone line to field questions from this Commonwealth's small businesses, as well as businesses wishing to start up in, or relocate to, Pennsylvania. EMAP operates and maintains a resource-rich environmental assistance website and distributes an electronic newsletter to educate and inform small businesses about a variety of environmental compliance issues.

(d) A description of any less intrusive or less costly alternative methods of achieving the purpose of the proposed regulation.

There are no less intrusive or less costly alternative regulatory provisions available.

The requirement to adopt and implement RACT requirements is federally mandated. The owners and operators of affected facilities, whether or not meeting the designation of small business, would be required to control VOC emissions to meet the levels established in this proposed rulemaking. The owners or operators of many potentially affected facilities would likely not require additional control measures to comply with the proposed RACT requirements.

(25) List any special provisions which have been developed to meet the particular needs of affected groups or persons including, but not limited to, minorities, the elderly, small businesses, and farmers.

No special provisions were developed. This proposed rulemaking is mandated by the CAA to satisfy RACT requirements.

All businesses, whether or not they are considered a small business, that are subject VOC emitting facilities, will be required to control emissions and all owners or operators, whether minorities or small businesses must meet federal RACT requirements in the most cost-effective manner available. The Department has established a small business assistance program that is available to provide confidential assistance to the small businesses.

(26) Include a description of any alternative regulatory provisions which have been considered and rejected and a statement that the least burdensome acceptable alternative has been selected.

No alternative regulatory provisions were considered. This proposed rulemaking is the least burdensome allowed by the EPA's 2016 O&G CTG. Many owners or operators of affected VOC emitting facilities may not need to do anything more to control emissions than they have already done. This proposed rulemaking establishes consistent standards Commonwealth-wide for the owners and operators of affected VOC emitting facilities.

(27) In conducting a regulatory flexibility analysis, explain whether regulatory methods were considered that will minimize any adverse impact on small businesses (as defined in Section 3 of the Regulatory Review Act, Act 76 of 2012), including:

(a) The establishment of less stringent compliance or reporting requirements for small businesses.

Less stringent compliance or reporting requirements are not available for small businesses. RACT is federally mandated. Owners and operators of subject VOC emitting facilities that are also small businesses would have to comply with the proposed RACT requirements. The Department has established a small business assistance program that is available to provide confidential assistance to the small businesses.

(b) The establishment of less stringent schedules or deadlines for compliance or reporting requirements for small businesses.

Establishment of a less stringent compliance schedule or deadline for small businesses is not possible. RACT is federally mandated. Owners and operators of affected VOC emitting facilities that are also small businesses would have to comply with the proposed RACT requirements. The Department has established a small business assistance program that is available to provide confidential assistance to the small businesses.

(c) The consolidation or simplification of compliance or reporting requirements for small businesses.

Reporting requirements are the same for all affected facilities. RACT is federally mandated. Owners and operators of subject VOC emitting facilities that are also small businesses would have to comply with the requirements. The Department has established a small business assistance program that is available to provide confidential assistance to the small businesses.

(d) The establishment of performance standards for small businesses to replace design or operational standards required in the regulation.

No special provisions are included for small businesses. The standards included in the proposed rulemaking are recommended by the 2016 O&G CTG. There are no provisions which allow a different type of standard for small businesses. The Department has established a small business assistance program that is available to provide confidential assistance to the small businesses.

(e) The exemption of small businesses from all or any part of the requirements contained in the regulation.

No special provisions are included for small businesses. The standards included in this proposed rulemaking are recommended by the 2016 O&G CTG. There are no provisions which allow a different type of standard for small businesses. The Department has established a small business assistance program that is available to provide confidential assistance to the small businesses. See the response to question 24(c) for more information on the small business impact.

(28) If data is the basis for this regulation, please provide a description of the data, explain in detail how the data was obtained, and how it meets the acceptability standard for empirical, replicable and testable data that is supported by documentation, statistics, reports, studies or research. Please submit data or supporting materials with the regulatory package. If the material exceeds 50 pages, please provide it in a searchable electronic format or provide a list of citations and internet links that, where possible, can be accessed in a searchable format in lieu of the actual material. If other data was considered but not used, please explain why that data was determined not to be acceptable.

The basis for this proposed rulemaking is the federally mandated RACT requirements which are based on the data and analysis found in EPA's [Control Techniques Guidelines for the Oil and Natural Gas Industry, EPA-453/B-16-001, October 2016](#). This proposed rulemaking uses the cost data and justification provided in GP-5, GP-5A, and Exemption 38, which can be found in the Technical Support Document located at <http://www.depgreenport.state.pa.us/elibrary/>.

(29) Include a schedule for review of the regulation including:

- | | |
|---|--|
| A. The length of the public comment period: | <u>60+ days</u> |
| B. The date or dates on which any public meetings or hearings will be held: | <u>Quarter 2, 2020</u> |
| C. The expected date of delivery of the final-form regulation: | <u>Quarter 4, 2020</u> |
| D. The expected effective date of the final-form regulation: | <u>Quarter 4, 2020</u> |
| E. The expected date by which compliance with the final-form regulation will be required: | <u>Quarter 4, 2020</u> |
| F. The expected date by which required permits, licenses or other approvals must be obtained: | <u>1 year after the effective date</u> |

(30) Describe the plan developed for evaluating the continuing effectiveness of the regulations after its implementation.

The Board is not establishing a sunset date for this proposed rulemaking, since it is needed for the Department to carry out its statutory authority. The Department will closely monitor this proposed rulemaking after promulgation as a final-form rulemaking in the *Pennsylvania Bulletin* for its effectiveness and recommend updates to the Board as necessary.