



Civil & Environmental Consultants, Inc.

Do I Need an Air Permit? Permitting Basics for Oil & Gas Facilities

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Air Quality Compliance Training

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Presentation Overview

- Air Permitting – Background and Definitions
- Local Air Permitting Authorities
- Pennsylvania Air Permitting Overview
- Steps to Conduct an Air Permit Analysis
- PA Oil & Gas Facility Air Permitting Examples

Why are air permits required?

- Congress established the New Source Review (NSR) Permitting program as part of the 1977 Clean Air Act (CAA) Amendments.
- NSR requires stationary sources of air pollution to get permits before construction starts.
- Regulating Authority
 - The USEPA establishes the basic requirements for an NSR program in federal regulations.
 - States are delegated the authority to implement an NSR permitting program in their State Implementation Plan (SIP), which must be as approved by the USEPA and at least as stringent as federal requirements.
 - With an approved SIP, States may develop their own unique NSR permitting program and requirements.

Air Permit Drivers

- Proposed Stationary Sources
- Anticipated Potential to Emit
- State Permitting Requirements



Stationary Source

- Any building, structure, facility, or installation which emits or may emit a regulated pollutant under the Act [40 CFR §52.21(b)(5)] which belong to the same industrial grouping.
- “Same industrial grouping” [40 CFR §52.21(b)(6)] means:
 - Contiguous or adjacent properties, and
 - Are under common control; and
 - Have the same first two SIC digit code



Types of Stationary Sources

- Process Vents
- Dehydrators
- Engines and Turbines (non-electric)
- Boilers and Heaters
- Liquids Loading
- Storage Tanks
- Piping and Process Fugitive Components
- Cooling Towers



Potential to Emit & Regulated Pollutants

- Potential to Emit (PTE): The maximum capacity of a stationary source to emit a pollutant under its physical and operational design.
- National Ambient Air Quality Standards (NAAQS): Standards for pollutants considered harmful to public health and the environment.
- Regulated Air Pollutants
 - Criteria Pollutants – pollutants with NAAQS
 - Carbon Monoxide (CO)
 - Nitrogen Dioxide (NO₂)
 - Sulfur Dioxide (SO₂)
 - Particulate Matter (PM₁₀ and PM_{2.5})
 - Ozone (O₃)
 - Volatile Organic Compounds (VOC)
 - Nitrogen Oxides (NO_x)
 - Lead (Pb)
 - Hazardous Air Pollutants – federal list of 187 pollutants
 - Greenhouse Gases – not a criteria pollutant but subject to New Source Review

Air Permit Classifications

- Attainment & Non-Attainment Areas
 - Classification by geographic areas of the US (usually by county)
 - Attainment Areas: Areas that meet the NAAQS standards
 - Non-Attainment Areas: Areas that do not meet the NAAQS standards
 - Attainment designations are made by pollutant.
 - Attainment Area Permitting: Prevention of Significant Deterioration (PSD)
 - Non-Attainment Area Permitting: Non-Attainment New Source Review (NNSR)
- Major and Minor Sources
 - Stationary sources are considered either major or minor for NSR based on the amounts of criteria pollutants they emit.
 - Major source thresholds are established for each criteria pollutant for attainment & non-attainment areas.
 - Sources exceeding thresholds are major sources; those not exceeding are minor sources.

Types of Air Permits

Clean Air Act Mandates 3 Major Permit Programs

Preconstruction or New Source Review Permits

- Required prior to start of construction
- Includes control technology and impacts review

Operating or Title V Permits

- Required prior to start of operation
- Includes applicable requirements, reporting, recordkeeping, monitoring, etc.

Acid Rain or Title IV Permits

- Aimed at reducing SO₂ & NO_x
- Applies to utilities industry
- Based on Cap and Trade system

Local Air Permitting Authorities

- Pennsylvania
 - PA Department of Environmental Protection (PADEP) except Allegheny County and City of Philadelphia
 - Allegheny County Health Department (ACHD), Air Quality Program
 - City of Philadelphia, Air Pollution Control Board
 - West Virginia Department of Environmental Protection (WVDEP), Division of Air Quality
 - Ohio Environmental Protection Agency (OEPA), Division of Air Pollution Control
- *This presentation will primarily focus on PADEP air permitting***

Pennsylvania – Pre-Construction Air Permits

- Air Permit Exemption
 - PA maintains a list of Air Quality Permit Exemptions
 - If exempt, a Plan Approval or General Permit is not required for construction
- Request for Determination (RFD)
 - Case-by-case exemption submitted to DEP for approval
 - If the RFD is approved, a Plan Approval or General Permit is not required
- General Plan Approval/Operating Permit
 - General plan approval/operating permit for a specific type of facility (~19 PA GPs)
 - Standardized terms and conditions
 - Only for minor sources of air emissions
 - Shorter review time ~30 days
- Plan Approval
 - Required prior to construction of a new source, unless source qualifies for a general permit or exemption
 - Construction permit, operating permit separate
 - 180 day review time

Pennsylvania – Operating Air Permits

- Types

- Title V Operating Permit
- State-Only Minor Source Operating Permit
- Synthetic Minor Operating Permit
- General Plan Approval/Operating Permit

- Timing

- Apply for operating permit separately, after pre-construction permit is approved and prior to operation
- General Permit is both pre-construction and operating permit –only one permit is required

Pennsylvania Air Permitting Exemptions

- PADEP Air Quality Permit Exemptions – Doc. 275-2101-003
 - Updated July 1, 2021
 - Exemption 38 – Oil & Gas Production Facilities
 - Conventional wells and drilling/completion equipment exempt
 - Unconventional well production – conditional exemption if facility can meet criteria – Exemption 38 a, b, c based on construction date
 - Exemption 36 - Source(s) qualifying under § 127.449 as de minimis emission increases
 - Other listed categorical exemptions based on source type and size (Example, Exemption 3 - Combustion turbines rated < 1,000 hp)
- Facility specific conditions in case-by-case air permit exemption requests (referred to as Request for Determination (RFD))
- Approval of exemptions may include compliance obligations (conditional exemptions, recordkeeping, etc.).
- Permit exemption does not exempt you from other compliance obligations (NSPS compliance, air emission/greenhouse gas reporting, etc).

Overview of Exemption 38

- Exemption 38 – Oil & Gas Production Facilities - 3 criteria based on construction date:
 - 38(a) – Applicable to all oil & gas production facilities constructed prior to August 10, 2013
 - 38(b) – Applicable to all conventional oil & gas production facilities & unconventional oil & gas production facilities meeting certain conditions constructed between August 10, 2013 and August 7, 2018
 - 38(c) - Applicable to all conventional oil & gas production facilities & unconventional oil & gas temporary sources and sources below exemption thresholds constructed on or after August 8, 2018
- Exemption 38 is applicable to production facilities only – midstream/compression facilities permitted under GP-5

Exemption 38(b) vs. Exemption 38(c)

Exemption 38(b)

- Construction between August 10, 2013 and August 7, 2018
- Exempt: well drilling, completions, work-over activities, non-road engines
- LDAR: Initial and annual
- VOC emissions less than 2.7 TPY
- NOx emissions from engines less than 100 lbs/hr, 1,000 lbs/day, 2.75 tons per ozone season or 6.6 TPY
- HAP emissions less than 0.5 TPY per individual HAP or 1 TPY for all HAPs combined
- Emission reduction requirements for storage tanks & enclosed flaring for all permanent flares
- Operators required to submit a Compliance Demonstration Report (CDR) within 180 days of well completion

Exemption 38(c)

- Construction on or after August 8, 2018
- Exempt: site preparation, well drilling, hydraulic fracturing, completion, work-over activities, temporary flaring, non-road engines
- LDAR: Initial and semi-annual
- VOC emissions less than 2.7 TPY
- NOx emissions from engines less than 100 lbs/hr, 1,000 lbs/day, 2.75 tons per ozone season or 6.6 TPY
- HAP emissions less than 0.5 TPY per individual HAP or 1 TPY for all HAPs combined
- Requirements of NSPS OOOO and OOOOa incorporated by reference
- Operator must keep adequate records for five years to show compliance with the exemption criteria (CDR is not required)
- Methane emissions less than 200 TPY
- Best management practices for pigging operations

Pennsylvania Oil & Gas Permitting

- PADEP General Permits
 - GP-5 – Natural Gas Compression Stations, Processing Plants, and Transmission Stations
 - GP-5A - Unconventional Natural Gas Well Site Operations and Remote Pigging Stations
 - In order to use GP, facility must be able to meet standard terms and conditions, emission limits and specified source categories
 - GP is the facility's pre-construction and operating permit
- If facility can't meet exemption or GP requirements, then the facility must apply for a Plan Approval for pre-construction authorization, then apply for a Operating Permit post-construction.

GP-5 and GP-5A Sources

Sources Common to Both

- Glycol Dehydration Units
- Stationary Natural Gas-Fired Spark Ignition Internal Combustion Engines
- Reciprocating Compressors
- Storage Vessels
- Tanker Truck Load-Out Operations
- Fugitive Emissions Components
- Natural Gas-Driven Pneumatic Controllers
- Natural Gas-Driven Pneumatic Pumps
- Enclosed Flares & Other Emission Control Devices
- Pigging Operations
- Natural Gas-Fired Combustion Units
- Stationary Natural Gas-Fired Combustion Turbines
- Centrifugal Compressors

GP-5 Only Sources

- Natural Gas-Fired Combustion Units
- Stationary Natural Gas-Fired Combustion Turbines
- Centrifugal Compressors

GP-5A Only Sources

- Wellbore Liquids Unloading Operations

GP-5 and GP-5A Emission Limits

- Facility-wide emission limits (tons/rolling 12-month period):
 - NO_x, CO, SO_x, PM₁₀, PM_{2.5} = 100 tons
 - VOC = 50 tons
 - Total HAP/Individual HAP = 25 tons/10 tons
- Lower facility-wide emission limits for NO_x and VOC for Bucks, Chester, Delaware, Montgomery & Philadelphia counties (25 tons)
- Other emission rates by source (Example: Emission rates for engines)

Allegheny County

- Permitting Authority - Allegheny County Health Department
- Largely follows PADEP exemptions
- Will request a Request for Determination (RFD)
 - Submit before drilling
- No general permits, but will follow PADEP with some additional requirements (i.e. more frequent reporting requirements)



West Virginia DEP Permitting

Permit Levels for 45CSR13

Minor Source Permitting

	Application Fee	Criteria	Application Type
Permit Determination	None	No permit required if Less than Modification AND change does not result in an increase above a numerical limit in permit	Written Request OR Permit Determination Form
Administrative Update (Class I)	None	Decrease in emissions OR Permanent removal of equipment OR More stringent requirements OR Change in MRR that is equivalent or superior	Written Request OR Permit Determination Form OR Application for Permit
Administrative Update (Class II)	\$300 + 45CSR22 fees	Less than Modification	Permit Determination Form OR Application for Permit
Construction Permit	\$1000 + 45CSR22 fees	6pph AND 10tpy of any regulated air pollutant OR 144ppd of any regulated air pollutant OR 2pph OR 5tpy of aggregated HAP OR 45CSR27 TAP (10% increase if above BAT triggers or increase to BAT triggers) OR Subject to applicable Standard or Rule	Application for Permit
Modification Permit	\$1000 + 45CSR22 fees	Same as construction	Application for Permit
General Permit (Class I)	\$250	Same as construction, but subject to specific eligibility requirements.	Registration Application
General Permit (Class II)	\$500 + 45CSR22 fees	Same as construction, but subject to specific eligibility requirements.	Registration Application

Source: WVDEP website

WVDEP Oil & Gas Permitting

- General Permits:
 - G35-D – Natural Gas Compressor Station or Dehydrator Facilities
 - G70-D – Natural Gas Production Facilities at the Well Pad
 - Must be submitted through Electronic Submission System (ESS)
- R13 permitting option
 - Use if can't meet terms and conditions in General Permits
 - Use if General Permit thresholds are exceeded
 - Paper filing

Ohio Oil & Gas Permitting

- Drilling/completions are exempt
- General Permits
 - GP 12.1 Small Flare (≤ 10 MMBtu/hr)
 - GP 12.2 Large Flare ($10 \geq 32$ MMBtu/hr)
 - Sources included
 - Dehydrators
 - Engines
 - Fixed roof storage tanks
 - Flares
 - Ancillary equipment
- Permit to Install/Permit to operate – Option if GP requirements can't be met
- File through eBiz/Air Services

Do I need an air permit?

- It depends.....
- Conduct an air permit analysis – using the following steps

Step 1. Identify Emission Sources

- Review facility design – identify stationary sources
- Communication with process engineers/operations group
- Should be as accurate as possible – avoid modifications later
- Review nearby sources for aggregation issues



Step 2. Collect Data

- Vendor data/equipment specifications
- Equipment sizes and capacities
- Production throughput information
- Fuel type and throughput
- Representative gas and water analysis
- SDS sheets



Step 3. Calculate Emissions

- Calculate source-specific and facility-wide potential to emit (PTE) for criteria pollutants, HAPs and GHGs
- Perform emission calculations using industry-specific accepted methods
 - Source specific emission factors
 - AP-42
 - USEPA and State guidance documents
- Combine collected operational data with emission factors and calculation procedures
- Document all references to calculation methods and data

Step 4. Conduct Regulatory Analysis

- Identify regulatory permitting agency
- Review agency-specific permitting requirements compared to calculated emissions – requirements vary
- Conduct federal regulatory analysis
- Document regulatory analysis
- If permit is required, submit permit application to regulatory agency



Elements of an Air Permit Application

- Site location and owner information
- Site layout/plot plan
- Site location map
- Process flow diagram with matching process description
- Emission calculations
- Regulatory analysis
- Equipment design specifications/vendor data
- MSDS/gas analysis
- Application forms required by permitting authority
 - PA Application forms – GP forms, General Information Form, Compliance Review form
- Application fees
- Public notices
- In some cases, air dispersion modeling (PSD/NNSR)



What can I do before permit approval?

- Pre-construction permit is required before construction unless source is exempt or has a RFD approval.
- PA is strict about no construction activities prior to permit approval.
- *Construction*—To physically initiate assemblage, installation, erection or fabrication of an air contamination source or an air pollution control device, including building supports and foundations and other support functions.
- No foundations, no equipment staging allowed; land clearing ok.

Air Permitting Tips

- Develop permitting strategy at design phase
 - Start with an accurate equipment inventory
 - Start permitting process early/ASAP
 - Keep air compliance in the forefront of facility design
 - Review and understand federal and state requirements – compliance required regardless of permit
- Read and understand your permit or exemption requirements
 - Review draft permit for accuracy and reasonableness – address concerns with your permit writer
 - Review your permit for accuracy with operations – was the facility actually built as designed
 - Conduct field audit to ensure operations are constructed and managed per air permit
- Communication with operations is imperative
 - Make facility operations staff aware of permitting requirements
 - Consider conducting operator awareness training
 - Be aware of modifications at facility

PA Oil & Gas Facility Permitting Examples

Example – Addition of Compression to Well Pad Site

Project Description

- Well Pad site with 6 wells
- Production started Feb. 2018
- Production equipment includes GPUs, condensate & produced water tanks, truck load out fugitives components
- Production equipment emissions: VOC < 2.7 TPY; NOx < 6.6 TPY; HAP < 1 TPY
- Compressor engine added in May 2019

Permitting Requirement

- Drilling/completion emissions exempt
- Original well pad site was authorized under Exemption 38(b) and a Compliance Demonstration was filed
- Addition of engine increased emissions above exemption thresholds
- Prior to installation of compressor engine, a GP-5A was obtained, covering all new and existing emission sources

Example – Water Storage Facility

Project Description

- Water storage facility used to store produced and flowback water from nearby well pads
- Water is both trucked and piped in and out of facility
- Emission sources include water tanks, loading and roadways
- Calculated emissions are VOC < 2.7 TPY; PM < 3 TPY; HAP < 1 TPY

Permitting Requirement

- Doesn't qualify for Exemption 38
- Facility exempt under Exemption 36: Source(s) qualifying under §127.449 as de minimis emission increases
- File Request for Determination prior to construction of facility
- DEP may stipulate monitoring or recordkeeping requirements in RFD approval

Example – Engine Modification

Project Description

- Well pad facility is currently permitted under GP-5A
- Facility includes GPUs, produced water tanks, and a compressor engine
- Need to replace existing engine due to failure

Permitting Requirement

- Replacement can qualify under “De Minimis Emission Increases” - GP-5A, Condition 15 if it meets:
 - Replacement unit definition:
 - New engine takes place of existing engine
 - New engine is identical (make/model) to existing engine
 - Same design parameters
 - Old engine is permanently removed
 - New engine meets BAT requirements
 - Written notification signed by RO including manufacturer, model, rated capacity, and serial number of the equipment is submitted

Example – Expansion of Compressor Station

Project Description

- Constructed compressor station is operated under a GP-5 permit issued by PADEP in 2019
- Facility includes 5 engines, 2 dehydrators with reboilers, condensate tanks
- Facility is planning on installing 5 new engines
- Combined emissions with new engines: NOX > 100 TPY; CO >100 TPY

Permitting Requirement

- Facility no longer can use GP-5 because emissions are over limits
- Plan Approval with BAT will be required
- Facility will now be a major source; therefore, a Title V Operating Permit will be required post installation

Contact Information

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