



# Drilling for Natural Gas in the Marcellus and Utica Shales: Environmental Regulatory Basics

July 2011 (Revised)

## Introduction

This fact sheet provides a basic overview of natural gas drilling in the Marcellus and Utica Shale regions of Ohio and the potential environmental issues associated with these activities. It also summarizes the regulatory authority of the Ohio Environmental Protection Agency (Ohio EPA) and Ohio Department of Natural Resources (ODNR) over activities associated with natural gas drilling and production.

## Where are the Marcellus and Utica Shale Deposits?

Together, the Marcellus and Utica Shale regions extend across New York, Pennsylvania, Maryland, West Virginia, Ohio and portions of Kentucky and Tennessee. The deposits sit between 7,000 and 12,000 feet below ground.

Both are important geologic formations because they hold large reserves of natural gas. Researchers estimate the Marcellus Shale alone could contain as much as 363 trillion cubic feet of natural gas, enough to satisfy U.S. energy demands for about 14 years.

Most drilling is now occurring in the Marcellus Shale region of Pennsylvania, with growing interest in West Virginia and New York. Because the Marcellus Shale is much thinner on its western edge, Ohio is experiencing far less Marcellus Shale drilling than other states. However, Ohio will likely see a significant increase in future drilling, as much of the state sits over the Utica Shale formation, which experts also predict holds large natural gas reserves and potentially oil.

## How is natural gas extracted from a shale formation?

Natural gas is extracted from the shale through a two-step process of horizontal drilling and hydraulic fracturing. To start, a production well is drilled thousands of feet downward and then gradually angled out horizontally through the shale deposit. The well is drilled horizontally to maximize the ability to capture natural gas once the shale is hydraulically fractured.

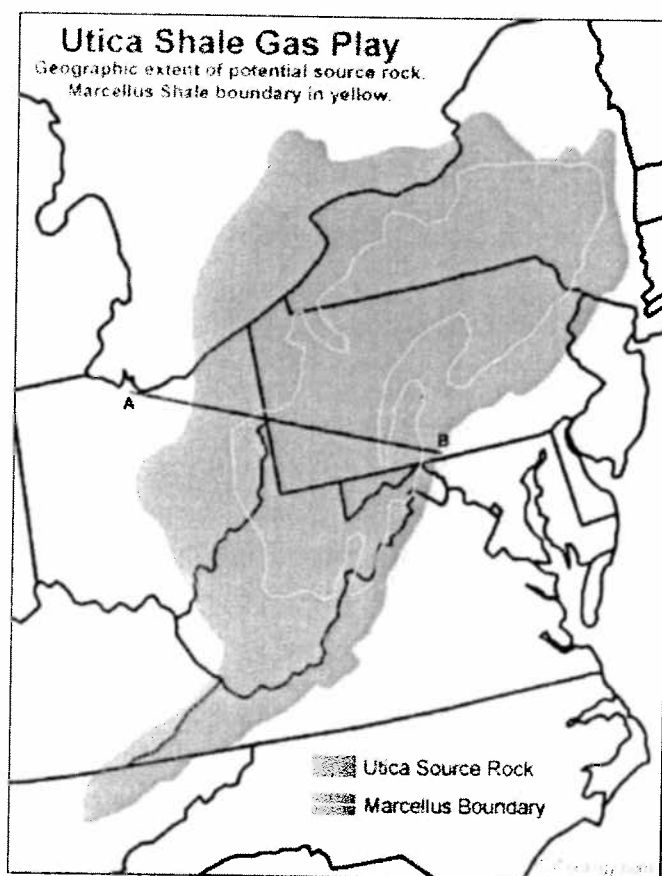


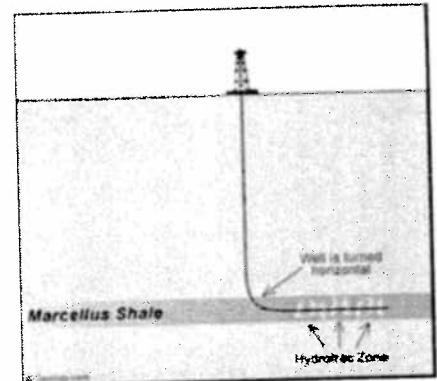
Figure 1. Marcellus and Utica Shale distribution

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After the well is drilled, a mixture of water, sand and chemical additives is injected at very high pressure to fracture the shale. This part of the process, called hydraulic fracturing (or "fracing"), is a technique used in the oil and gas industry since the 1950s. The sand keeps the fractured shale open and serves as a conduit for extracting the natural gas. The chemical additives reduce potential problems during drilling and gas production, such as bacterial build-up and the formation of scale, mineral deposits and rust.

It can take up to four million gallons of fresh water to fracture a single well. The water used in the fracturing process usually comes from a stream, river, reservoir or lake near the drill site, or in some cases, from a local municipal water plant.

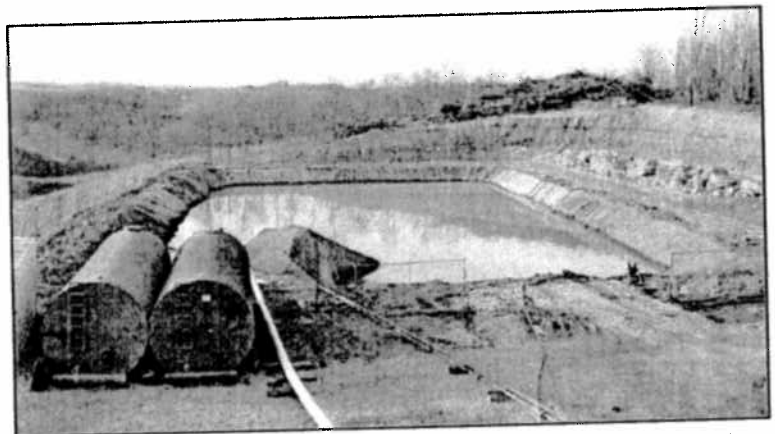


**Figure 2. Horizontal drilling process.**  
Graphic reprinted with permission of  
www.Geology.com

### What happens to water after hydraulic fracturing is complete?

Most of the water used to fracture the shale remains trapped thousands of feet underground after it is injected. However, internal pressure in the geologic formation forces some of the water (around 15-20 percent of the total volume injected) back to the surface through the well bore.

Most of this "flowback" or "frac" water comes back to the surface within seven to ten days after it is injected. Flowback water is stored temporarily in lagoons or tanks before being sent off-site for disposal. It is usually transported off-site by truck, although some companies are exploring rail transportation as an option.



**Figure 3. An on-site lagoon is one option for temporary storage of drill cuttings/fluids and flowback water.**

Drilling companies send brine and flowback water to disposal facilities that have permits to inject fluids thousands of feet underground into deep injection wells (called Class II wells).

Because of disposal costs, some drilling companies are recycling and reusing flowback water from one drill site to another. Having multiple drill sites in close proximity makes it more cost-effective to reuse flowback water. The concentration of iron, bacteria, suspended solids and other contaminants in flowback water is another factor in determining whether and how often it can be reused.

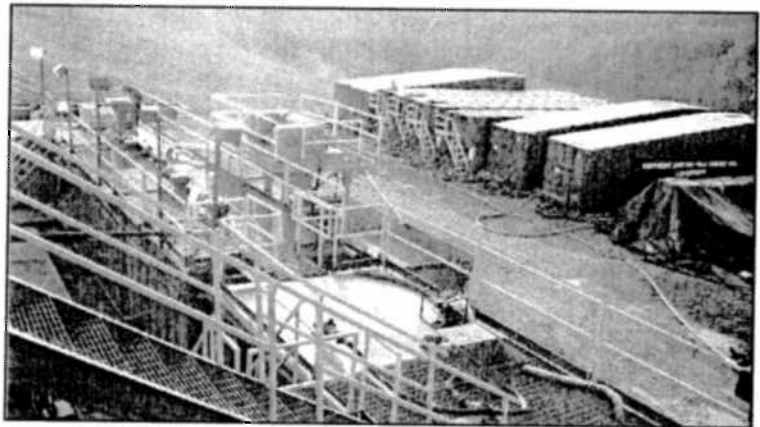
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## How is drilling in the Marcellus and Utica Shales regulated in Ohio?

ODNR, Division of Mineral Resources Management (DMRM), has primary regulatory authority over oil and gas drilling activity in Ohio, including regulations for well construction, siting, design and operation. ODNR regulates disposal of brine<sup>1</sup> and drilling fluids from oil and gas drilling/production. ODNR regulates Class II underground injection wells used for disposal of waste fluids from oil and gas drilling/production operations and transporters hauling these fluids in Ohio.

Ohio EPA's water quality certification requirements help reduce impacts to wetlands, streams, rivers or other waters of the state from the construction of a drill site. Ohio EPA also regulates sources of air emissions, and may require air permits for some of the equipment at the drill site. Finally, any solid waste sent off-site for disposal must be properly managed, either at a solid waste landfill, or beneficially reused, as authorized by Ohio EPA's Division of Materials and Waste and Management (DMWM). A summary of the regulatory authority between ODNR and Ohio EPA is provided in Table 1.



**Figure 4.** As an alternative to a lagoon, some drill sites use a series of frac tanks to collect flowback water.



**Figure 5.** Frac tanks are hauled by trailer to a disposal location.  
Photo reprinted with permission of [www.marcellus-shale.us](http://www.marcellus-shale.us)

<sup>1</sup> "Brine" includes all saline geological formation water resulting from, obtained from, or produced in connection with the exploration, drilling, or production of oil or gas, including saline water resulting from, obtained from, or produced in connection with well stimulation or plugging of a well. (R.C. 1509.01(U))

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**Table 1. Summary of ODNR and Ohio EPA regulatory authority over oil/gas drilling and production activities**

	Ohio Department of Natural Resources	Ohio Environmental Protection Agency
Drilling in the shale deposits	<ul style="list-style-type: none"> <li>✓ Issues permits for drilling oil/gas wells in Ohio.</li> <li>✓ Sets requirements for proper location, design and construction of wells.</li> <li>✓ Inspects and oversees drilling activity.</li> <li>✓ Requires controls and procedures to prevent discharges and releases.</li> <li>✓ Requires that wells no longer used for production are properly plugged.</li> <li>✓ Requires registration for facility owners with the capacity to withdraw water at a quantity greater than 100,000 gallons per day.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Requires drillers obtain authorization for construction activity where there is an impact to a wetland, stream, river or other water of the state.</li> <li>✓ Requires drillers obtain an air permit to install and operate (PTIO) for units or activities that have emissions of air pollutants.</li> </ul>
Wastewater and drill cutting management at drill sites	<ul style="list-style-type: none"> <li>✓ Sets design requirements for on-site pits/lagoons used to store drill cuttings and brine/flowback water.</li> <li>✓ Requires proper closure of on-site pits/lagoons after drilling is completed.</li> <li>✓ Sets standards for managing drill cuttings and sediments left on-site.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Requires proper management of solid wastes shipped off-site for disposal.</li> </ul>
Brine/flowback water disposal	<ul style="list-style-type: none"> <li>✓ Regulates the disposal of brine and oversees operation of Class II wells used to inject oil/gas-related waste fluids.</li> <li>✓ Reviews specifications and issues permits for Class II wells.</li> <li>✓ Sets design/construction requirements for Class II underground injection wells.</li> <li>✓ Responds to questions/concerns from citizens regard safety of drinking water from private wells from oil/natural gas drilling.</li> </ul>	
Brine/flowback water hauling	<ul style="list-style-type: none"> <li>✓ Registers transporters hauling brine and oil/gas drilling-related wastewater in Ohio.</li> </ul>	
Pumping water to the drill site from a public water supply system		<ul style="list-style-type: none"> <li>✓ Requires proper containment devices at the point of connection to protect the public water system.</li> </ul>

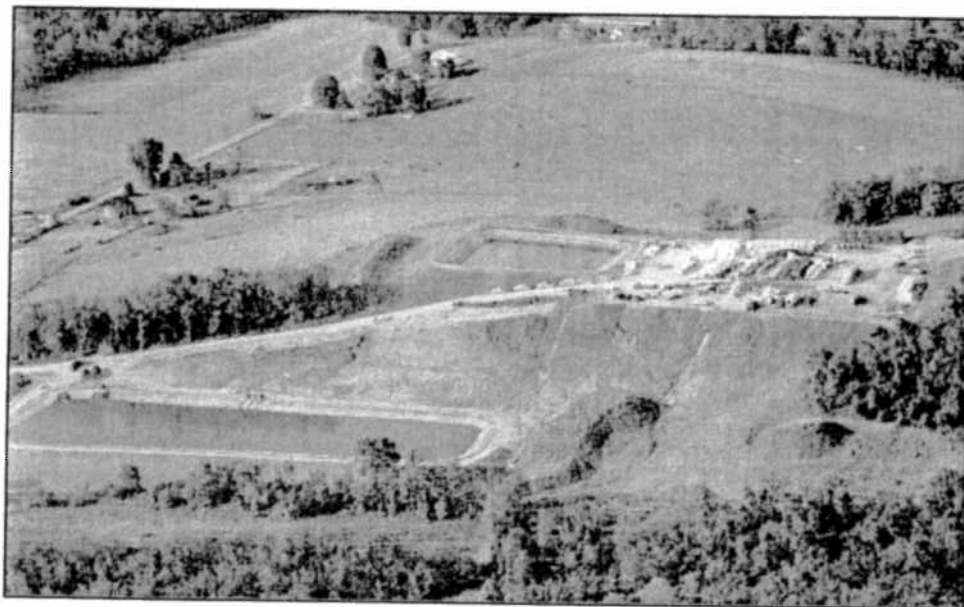


## What are the environmental concerns with drilling and hydraulic fracturing?

Citizens are becoming more aware and concerned about potential impacts of drilling activity on them, the environment and their communities.

Because Ohio has a significant number of permitted Class II underground injection control wells, many drilling companies have been transporting brine and flowback water into Ohio for deep-well disposal.

Flowback water picks up minerals from the shale formation, including iron, calcium, magnesium, barium and sulfur. It may contain low levels of naturally occurring radioactive elements such as radium. It also contains high concentrations of total dissolved solids (TDS), including chlorides, sodium and sulfates. High levels of TDS in streams, rivers or lakes can impair water quality and kill aquatic life.



**Figure 6. A Marcellus Shale drill site in Pennsylvania.**

Photo reprinted with permission of [www.marcellus-shale.us](http://www.marcellus-shale.us).

ODNR has the exclusive authority for brine disposal in Ohio. Ohio prohibits the direct discharge of brine or flowback water into waters of the state. Ohio is not authorizing the disposal of brine or flowback water at municipal wastewater sewage plants (also called publicly owned treatment works or POTWs).

Brine and flowback water disposed of in Ohio must be sent to an ODNR-permitted Class II injection well, unless granted an exemption by ODNR. Where feasible, recycling flowback water is strongly encouraged.

Under ODNR's laws, brine may be suitable for road surface application, if certain conditions are met. Other fluids from well drilling, including flowback water, cannot be applied to roadways. For more information on brine management options, contact ODNR, DMRM.

## Who regulates issues such as truck traffic and road maintenance at a drill site?

There is usually a short-term, but significant level of activity at a drill site, including transporting equipment, production water, sand, flowback water and possibly drill cuttings to and from the site. These activities can create significant truck traffic. The volume of truck traffic in a community is not

### **Total Dissolved Solids (TDS)**

A general term for organic and inorganic particles suspended in a liquid which easily pass through a small membrane filter system.

Total dissolved solids in flowback water include minerals, metals and soluble salts such as sodium, chlorides and sulfates.

TDS in the form of soluble salts in brine and flowback water from shale drilling can reach concentrations as high as 200,000 mg/l. As a point of comparison, the salinity of seawater from concentrated salts is about 35,000 mg/l.

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covered under Ohio EPA's or ODNR's regulations. Check with your community officials on local regulations or agreements that may have been established with a drilling company to restrict road access and to fix any damages to roads, bridges or other infrastructure.

## **Will drilling for natural gas contaminate my drinking water well?**

Ohio EPA, ODNR, and other technical experts familiar with hydraulic fracturing do not have data showing a risk of groundwater contamination from brine migrating thousands of feet from the Marcellus or Utica Shale fractures up into drinking water aquifers much closer (hundreds of feet) to the earth's surface.

There is the potential, although unlikely, for contamination of drinking water wells because of problems occurring closer to the surface. Gas and oil can migrate from a production well into an aquifer if a well casing is damaged, leaking or poorly constructed. Natural gas can also enter aquifers from old, abandoned oil and gas wells that are unplugged or poorly plugged. A new water well that is drilled can penetrate gas-rich organic shales or coal seams at shallow depths, allowing gas to enter the well. Buried organic deposits from old swamps or landfills may also release natural gas into soils overlying aquifers.

It's important to know that there have been thousands of oil and gas production wells drilled throughout the state's long history of oil and gas drilling without significant adverse impact to drinking water resources. If you do, however, suspect any problems with your drinking water well as a result of any oil/gas drilling activities in your area, contact the Ohio Department of Natural Resources, Division of Mineral Resources Management at (614) 265-6633.

Ohio EPA, ODNR and Ohio Department of Health (ODH) have also developed a fact sheet that provides a basic overview for private and/or public well owners who are considering collecting samples prior to oil and gas drilling (including the Marcellus and Utica shale deposits) in areas near their properties. This fact sheet is available at [www.epa.state.oh.us/portals/0/general%20pdfs/waterwellsampling.pdf](http://www.epa.state.oh.us/portals/0/general%20pdfs/waterwellsampling.pdf).

## **What about leasing rights if someone wants to drill on my property?**

The process of drilling a well begins with a lease agreement between the producing company and one or more landowners that make up a drilling unit. It is important for a landowner approached for a mineral rights lease to be aware of all the conditions of the lease that allow the producer to drill on their land.

Ohio EPA's and ODNR's regulations DO NOT cover private property lease agreements, and we cannot provide homeowners with any specific guidance on this topic. As a starting point for general information for landowners on leases, see ODNR's website at [www.ohiodnr.com/oil/oil\\_landowner/tabid/17732/Default.aspx](http://www.ohiodnr.com/oil/oil_landowner/tabid/17732/Default.aspx).

## **Where can I get more information?**

Ohio Department of Natural Resources, Division of Mineral Resources Management, Shale Development website: [www.ohiodnr.com/tabid/23415/default.aspx](http://www.ohiodnr.com/tabid/23415/default.aspx).

ODNR-Mineral Resources Management  
2045 Morse Rd., Building H-3  
Columbus, OH 43229-6693  
(614) 265-6633

Ohio Environmental Protection Agency, Marcellus/Utica Shale website: [www.epa.state.oh.us/shale.aspx](http://www.epa.state.oh.us/shale.aspx).



**Environmental  
Protection Agency**

John Kasich, Governor  
Mary Taylor, Lt. Governor  
Scott J. Nally, Director

June 28, 2011

To: Oil and Gas Industry Interested Party

Re: Draft Marcellus Shale Drilling Site Air Pollution General Permit

Dear Sir or Madam:

During the past several months, the Ohio EPA, Division of Air Pollution Control (DAPC) has been working to determine what, if any, air pollution requirements apply to well-site operations for the oil and gas industry, with an emphasis on Marcellus shale drilling. This work has been done in anticipation of significant growth in the Marcellus gas industry in Ohio.

The specific goals for this project include:

1. Understanding the activities and equipment used at a well site location;
2. Determine expected air pollution emissions to be generated from various well sites;
3. Determine any current applicable air pollution rules and regulations that apply to a well site;
4. Determine the need for or exemption from any applicable air pollution permits;
5. Determine the most efficient approach for applying for and obtaining any applicable air pollution permits; and
6. Develop and implement any necessary terms and conditions for any necessary air pollution permit.

Our overall goals are to make sure the well site operators know what they need to do to comply with any applicable air pollution requirements and to make any permitting processes as efficient as possible.

Historically, Ohio EPA has not required air pollution permits for oil and gas well sites, believing that no permits were required under our state rules<sup>1</sup>. Based on our review and

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<sup>1</sup> Although no permits have been required for well site operations, Ohio EPA has historically required permits for gas processing operations like gas sweetening and for processes like gas compressor stations.

changes in the operation of the industry, it appears these underlying assumptions are no longer correct.

My staff has worked closely with industry contacts to understand the typical equipment and usage located at well sites. (We understand that some facilities may be different from what we developed.) We have spent a lot of time understanding the equipment, developing emissions estimates and reviewing applicable state and federal rules. We have gotten to the point of developing an initial draft of some permit terms and conditions for well site operations. This letter is being used to transmit the result of this work to you so that those that are affected can provide us with comments and suggestions.

### **The Results of our Analysis**

Based on the result of our rule analysis, our belief is that the typical activities that occur during the drilling and fracking phase at a well site are exempt from any air pollution permit requirements. This is mainly because the equipment used (and the resulting air emissions) are temporary and are exempt from permitting requirements because they are temporary.

However, some of the equipment used during the production phase of the well are not exempt from permitting requirements and, therefore, need air permits. Note that in many cases, owners or operators must obtain an installation permit prior to beginning construction of sources that need permits.

### **The General Permit Program**

Ohio's air pollution rules require owners or operators of non exempt air pollution sources to apply for and obtain an installation permit (known as a *permit-to-install* or a *permit-to-install and operate*) prior to beginning construction of any air pollution source<sup>2</sup>. The installation permit describes all of the applicable rules that apply, and includes any applicable emission limits, operating restrictions, monitoring requirements, testing requirements and reporting requirements.

Ohio's rules also require owners or operators to obtain operating permits, although, in the case of non Title V facilities, the installation permit functions as the operating permit, so no further permit is required. DAPC expects most well sites to be considered non Title V facilities.

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<sup>2</sup> Note that there are also special rules for portable sources that allow for their relocation without obtaining a new permit. See Ohio Administrative Code (OAC) paragraphs 3745-31-03(A)(1)(p) and 3745-31-05(H) found at: [http://www.epa.ohio.gov/dapc/regs/3745\\_31.aspx](http://www.epa.ohio.gov/dapc/regs/3745_31.aspx).

In order to improve efficiency, over the years, DAPC has developed several different permit processing approaches. One of these approaches is called the General Permit (GP) Program.

A general permit is the same as any permit-to-install or permits-to-install and operate that DAPC issues except all the terms and conditions of the permit have been developed in advance. This is referred to as the "model general permit". A potential applicant can review the model general permit qualifying criteria and terms and conditions and then complete the application and sign the qualifying criteria document if they believe they qualify for that model general permit. DAPC will review the applicant's information to confirm they meet the qualifications and then issue the model general permit to the applicant. At that point it becomes the applicants "general permit." All the terms and conditions of the "model general permit" remain the same when it is issued as the "general permit." The general permit will include a cover page that identifies facility and emission unit specific information.

The biggest advantage of the general permit approach is the speed of approval. Normal permits are developed case-by-case and require a lot of detailed rule analysis and permit term development. For general permits, all of this detailed analysis has been done up-front so that when a general permit application comes into the agency, all staff need to review is the qualifying criteria to determine approvability. This can reduce approval times from 4-6 months down to as little as two weeks.

More details concerning this program can be found at:

<http://www.epa.ohio.gov/dapc/genpermit/genpermits.aspx>

DAPC decided that the general permit approach was best for air permits for well sites.

### **Air Pollution Sources that need Permits**

Our analysis determined that the following equipment/processes found at well sites typically need to obtain installation permits:

1. Natural Gas Production System – consisting of any/all gas-oil/condensate and /or gas-water separators, natural gas-fired heaters/boilers, equipment/pipeline leaks, and dehydrators;
2. Spark Ignition Internal Combustion Engines – (two 215 HP units are included in the GP);
3. Unpaved roadways;
4. Truck Loading Rack – for loading condensates to trucks;
5. Condensate Storage Tanks – Up to four 16,800 gallon tanks are allowed under the proposed GP.
6. Combustion Device/Flare – To be required once an, as of yet undetermined,

amount of gas is produced.

DAPC has developed draft qualifying criteria and GP terms and conditions to cover the above equipment. Some facilities may have other equipment that may also need to be covered by the GP. If you have any questions about other equipment, please provide those in your comments.

## **Material that Needs Reviewed**

Attached you will find the following documents:

1. Model General Permit (MPG) Qualifying Criteria Document
2. Natural Gas Extraction Well Site Production Line Draft GP
3. Typical natural gas extraction well site permit application forms

At this time we are asking you to review the first two documents and provide comment. We do not need you to review the third document. Instead, it is being presented to you to give you an idea what additional forms you will need to complete as part of your application.

The first document, the qualifying criteria, contains a form that you will fill out in order to obtain a general permit. Please review the qualifying criteria to make sure your typical well sites can qualify. If not, we need to know what does not work so we can make changes to the GP and qualifying criteria document. We want to cover as many well sites as possible under the GPs.

Review closely the terms and conditions in the draft GP. These terms contain detailed requirements that you will have to meet once you obtain a GP. You need to review these closely to determine if your equipment can meet these requirements.

## **Deadline**

We realize this is a lot of material to review. However, we are trying to get this process complete as soon as possible to address the needs of the industry and the citizens of Ohio. Therefore, we are asking you to review this material and provide comments by Friday, July 8, 2011.

## **What Comes Next**

DAPC staff will review your comments and make any necessary changes to the qualifying criteria document and the Model General Permit terms. Once this task is complete, we will post the material for its formal 30-day comment period. If everything goes well at that point, then the general permit could be ready for use several weeks

Marcellus Shale Drilling Draft General Permit  
June 28, 2011  
Page 5

after the 30-day comment period is up. If significant comments are received at that point, then it is unknown exactly when the final GPs will be complete but we will strive to get them done as soon as possible.

If you have any questions, please do not hesitate to contact me at 614-644-3611.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael E. Hopkins".

Michael E. Hopkins, P.E.  
Assistant Chief, Permitting, DAPC

cc: Scott Nally, Director  
Bob Hodanbosi, Chief, DAPC  
Andrew Hall, DAPC  
Laurie Stevenson, Dir. Office  
Misty Parsons, DAPC  
Cheryl Suttman, DAPC  
Ben Cirker, DAPC  
All DO/Laa Air Unit Supervisors





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### **The Results of our Analysis**

Based on the result of our rule analysis, our belief is that the typical activities that occur during the drilling and fracking phase at a well site are exempt from any air pollution permit requirements. This is mainly because the equipment used (and the resulting air emissions) are temporary and are exempt from permitting requirements because they are temporary.

However, some of the equipment used during the production phase of the well are not exempt from permitting requirements and, therefore, need air permits. Note that in many cases, owners or operators must obtain an installation permit prior to beginning construction of sources that need permits.

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Michael E. Hopkins, P.E.  
Assistant Chief, Permitting, DAPC

cc: Scott Nally, Director  
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All DO/Laa Air Unit Supervisors

FOR OHIO EPA USE

FACILITY ID \_\_\_\_\_

EU ID \_\_\_\_\_

PTI# \_\_\_\_\_

## EMISSIONS ACTIVITY CATEGORY FORM STORAGE TANK

*This form is to be completed for each storage tank for which a permit is required. State/Federal regulations which may apply to storage tanks are listed in the instructions. Note that there may be other regulations which apply to this emissions unit which are not included in this list.*

1. Reason this form is being submitted (Check one)

☐ New Permit      ☐ Renewal or Modification of Air Permit Number(s) (e.g. T001) \_\_\_\_\_

2. Type of tank: ☐ Fixed roof tank      ☐ Variable vapor space tank      ☐ Pressure tank  
☐ External floating roof tank      ☐ Internal floating roof tank

3. Location of tank:      ☐ Indoors      ☐ Outdoors      ☐ Underground

4. a) Tank capacity: \_\_\_\_\_ gallons or \_\_\_\_\_ barrels

If capacity is provided in barrels, enter the number of gallons per barrel: \_\_\_\_\_

b) Working volume, if different from tank capacity: \_\_\_\_\_ gallons or \_\_\_\_\_ barrels

5. Shape and dimensions:

☐ Cylindrical      ☐ Spherical      ☐ Other, specify \_\_\_\_\_

☐ Horizontal tanks:  
Tank shell length: \_\_\_\_\_ ft.  
Tank shell diameter or width: \_\_\_\_\_ ft.

☐ Vertical tanks:  
Tank shell height: \_\_\_\_\_ ft.  
Tank shell diameter or width: \_\_\_\_\_ ft.

6. Tank shell material: ☐ Steel      ☐ Aluminum      ☐ Other, specify \_\_\_\_\_

7. If this tank is located outdoors and above ground, provide the paint color of the tank's shell and roof and indicate the condition of the paint.

Shell:

☐ Aluminum (specular)      ☐ Gray (dark)      ☐ White      ☐ Red (primer)  
☐ Aluminum (diffuse)      ☐ Gray (light)      ☐ Other, specify \_\_\_\_\_

Roof:

☐ Aluminum (specular)      ☐ Gray (dark)      ☐ White      ☐ Red (primer)

☐ Aluminum (diffuse)    ☐ Gray (light)    ☐ Other, specify \_\_\_\_\_  
Condition of paint:    ☐ Good    ☐ Poor

8. If this tank is a variable vapor space tank or is interconnected to a variable vapor space tank, complete the following:

- a) Capacity of vapor expansion system: \_\_\_\_\_ gallons or \_\_\_\_\_ barrels
- b) Identify all tanks and other vapor sources interconnected to the vapor expansion system:
- \_\_\_\_\_

9. If this tank is subject to the following federal rules, complete the following:

- ☐ New Source Performance Standards under 40 CFR 60, Subpart Ka, "Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984"

a) Date of initial fill with petroleum liquid \_\_\_\_\_

b) Was tank out of service for a period of a year or more? ☐ Yes ☐ No  
If yes, identify the date of subsequent refilling with petroleum liquid after the most recent out-of-service period of a year or more. \_\_\_\_\_

- ☐ Maximum Achievable Control Technology (MACT) Standards under 40 CFR 63, Subpart G (HON Tanks)

a) This tank is defined as a: ☐ Group 1 storage vessel ☐ Group 2 storage vessel

b) At the storage temperature, maximum true vapor pressure of total HAPs: \_\_\_\_\_

10. Supplemental data, check all that apply:

☐ Tank was converted from an external floating roof tank or a fixed roof tank to an internal floating roof tank; provide type and date of conversion: \_\_\_\_\_

☐ Tank is used to store produced crude oil or condensate prior to custody transfer.

☐ Tank is insulated; describe: \_\_\_\_\_

☐ Tank is heated and indicate temperature (in degrees Fahrenheit): \_\_\_\_\_

11. Material stored \_\_\_\_\_ Trade Name \_\_\_\_\_

Density: \_\_\_\_\_ lbs/gal or \_\_\_\_\_ °API Producer \_\_\_\_\_

12. Temperature of stored material: Average \_\_\_\_\_ °F and Maximum \_\_\_\_\_ °F

13. Vapor pressure of stored material:

a) Actual vapor pressure: \_\_\_\_\_ psia at average storage temperature



- b) Reid vapor pressure, in psia: \_\_\_\_\_ psia at maximum storage temperature  
 Average \_\_\_\_\_  
 Minimum \_\_\_\_\_  
 Maximum \_\_\_\_\_
- c) If material stored is a gas or liquified gas, provide the pressure at which it is stored:  
 \_\_\_\_\_ psi gauge at \_\_\_\_\_ °F
14. The vapor molecular weight: \_\_\_\_\_ lbs/lb-mole
15. If the material is a liquid other than gasoline, fuel oil, kerosene, crude oil, lubricant or other petroleum liquid, answer the questions below:
- Is it a photochemically reactive material? ☐ Yes ☐ No
16. Is the material a hazardous waste? ☐ Yes ☐ No  
 If yes, identify type (EPA hazardous waste number) \_\_\_\_\_
17. Type of filling: ☐ Splash ☐ Submerged ☐ Other, specify \_\_\_\_\_
18. Indicate the year (or 12-month period) for which throughput is provided in items 19 and 20: \_\_\_\_\_
19. The maximum daily throughput of material stored: \_\_\_\_\_ gallons or \_\_\_\_\_ barrels.
20. Maximum annual throughput of material stored: \_\_\_\_\_ gallons or \_\_\_\_\_ barrels.
21. Identify the control equipment associated with this tank.
- a) Type of vapor control system \_\_\_\_\_
- b) Date tank was equipped with or vented to vapor control system (month/year) \_\_\_\_\_
22. Complete the table below for any pressure or vacuum relief vent valve.

Type of Vent Valve	Pressure Setting	Vacuum Setting	If pressure relief is discharged to a vapor control system, identify the vapor control system

If this is a **Fixed Roof, Variable Vapor Space or Pressure Tank**, complete items 23 through 27:

23. If the tank is vertical, what type of roof does it have?  
☐ Cone roof Height: \_\_\_\_\_ ft ☐ Dome roof Height: \_\_\_\_\_ ft
24. The average height of the liquid material stored within the tank during the year: \_\_\_\_\_ ft.
25. The maximum height of the liquid material stored within the tank during the year: \_\_\_\_\_ ft.

26. The average liquid surface temperature: \_\_\_\_\_ °F
27. Is this tank bolted or riveted construction? ☐ Yes ☐ No

If this tank is an **External Floating Roof Tank**, complete items 28 through 34:

28. Is the external floating roof domed? ☐ Yes ☐ No
29. Type of floating roof: ☐ Double Deck ☐ Pontoon ☐ Other, specify \_\_\_\_\_
30. Type of shell construction: ☐ Welded ☐ Riveted or bolted
31. Are all openings in the external floating roof, except automatic bleeder vents, rim space vents, leg sleeves, main roof drain, emergency roof drains and slotted gauging/sampling wells, equipped with both a cover, seal or lid without visible gaps and a projection into the tank below the liquid surface?
- ☐ Yes ☐ No

If no, explain: \_\_\_\_\_

32. Is there a slotted gauging/sampling well?

☐ Yes ☐ No

If yes, is it equipped with an object which floats on the liquid surface within the well and which covers at least 90 percent of the area of the well opening?

☐ Yes ☐ No

33. On the blank lines to the left of the various types of roof fittings shown below, indicate the number, if any, of each fitting.

Access hatch (24-inch diameter well)

\_\_\_\_\_ Bolted cover, gasketed  
\_\_\_\_\_ Unbolted cover, ungasketed  
\_\_\_\_\_ Unbolted cover, gasketed

Vacuum breaker (10-inch diameter well)

\_\_\_\_\_ Weighted mechanical actuation, gasketed  
\_\_\_\_\_ Weighted mechanical actuation, ungasketed

Unslotted guide-pole/sample well (8-inch diameter unslotted pole, 21-inch diameter well)

\_\_\_\_\_ Ungasketed sliding cover ☐ With sleeve  
\_\_\_\_\_ Gasketed sliding cover ☐ With sleeve ☐ With wiper

Slotted guide-pole/sample well (8-inch diameter unslotted pole, 21-inch diameter well)

\_\_\_\_\_ Ungasketed sliding cover, without float  
\_\_\_\_\_ Gasketed sliding cover, without float  
\_\_\_\_\_ Gasketed sliding cover, with float

Gauge-float well (20-inch diameter)

\_\_\_\_\_ Unbolted cover, ungasketed  
\_\_\_\_\_ Unbolted cover, gasketed  
\_\_\_\_\_ Bolted cover, gasketed

Gauge-hatch/sample well (8-inch diameter)

\_\_\_\_\_ Weighted mechanical actuation, gasketed  
\_\_\_\_\_ Weighted mechanical actuation, ungasketed

Roof leg (3-inch diameter)

\_\_\_\_\_ Adjustable, pontoon area

\_\_\_\_\_ Adjustable, center area

\_\_\_\_\_ Adjustable, double-deck roofs

\_\_\_\_\_ Fixed

☐ Gasketed

☐ Gasketed

☐ Ungasketed

☐ Ungasketed

☐ Sock

☐ Sock

Roof drain (3-inch diameter)

\_\_\_\_\_ Open

\_\_\_\_\_ 90% closed

Roof leg (2-1/2-inch diameter)

\_\_\_\_\_ Adjustable, pontoon area

\_\_\_\_\_ Adjustable, center area

\_\_\_\_\_ Adjustable, double-deck roofs

\_\_\_\_\_ Fixed

Rim vent (6-inch diameter)

\_\_\_\_\_ Weighted mechanical actuation, gasketed

\_\_\_\_\_ Weighted mechanical actuation, ungasketed

34. The average wind speed at the tank site: \_\_\_\_\_ mph.

**If this tank is an Internal Floating Roof Tank, complete items 35 through 41:**

35. Type of floating decks:

☐ Contact deck

☐ Noncontact deck

36. Type of roof above floating decks:

☐ Column-supported

☐ Self-supporting

37. If roof is column-supported, identify the type of column construction:

☐ 9-inch by 7-inch built-up columns

☐ Other, specify \_\_\_\_\_

☐ 8-inch diameter pipe columns

38. Floating deck seam construction:

☐ Welded

☐ Bolted

☐ Other, specify \_\_\_\_\_

39. If deck seams are bolted, complete a) or b):

a) ☐ Continuous sheet construction; specify width of sheets (e.g., 5 ft, 6 ft, or 7 ft): \_\_\_\_\_

☐ Panel construction; specify size of panels (e.g., 5 ft x 7.5 ft, or 5 ft x 12 ft): \_\_\_\_\_

b) Total length of bolted deck seams: \_\_\_\_\_ ft

Total area of floating deck: \_\_\_\_\_ sq ft

40. On the blank lines to the left of the various types of floating deck fittings shown below, indicate the number, if any, of each fitting.

Access hatch (usually one)

\_\_\_\_\_ Bolted cover, gasketed

\_\_\_\_\_ Unbolted cover, ungasketed

\_\_\_\_\_ Unbolted cover, gasketed

Automatic gauge float well (usually one)

\_\_\_\_\_ Bolted cover, gasketed

\_\_\_\_\_ Unbolted cover, ungasketed

\_\_\_\_\_ Unbolted cover, gasketed

\_\_\_\_\_ Stub drains (1-inch diameter; not used on welded contact deck)

Sliding cover, ungasketed

Pipe column, ungasketed sliding cover

— Built-up column, ungasketed sliding cover

Slotted pipe, ungasketed sliding cover

Sample well, slit fabric seal (10% open area)

\_\_\_\_\_ Weighted mechanical actuation, ungasketed

- ☐ Yes      ☐ No

If no, explain: \_\_\_\_\_

42. Type of seal between floating roof and tank well:

- ☐ Dual seals (primary seal with secondary shield mounted above it)

- Date installed \_\_\_\_\_  
(month/year)

Type: ☐ Liquid-mounted, liquid-filled  
☐ Liquid-mounted, resilient foam-filled  
☐ Vapor-mounted, resilient foam-filled  
☐ Mechanical shoe (complete item below)  
☐ Flexible wiper  
☐ Other, specify \_\_\_\_\_

Vertical length of shoe \_\_\_\_\_ inches  
Vertical length of shoe above stored liquid surface \_\_\_\_\_ inches

44. Secondary seal information:

Manufacturer \_\_\_\_\_ Type: ☐ Rim-mounted, flexible wiper  
 Make or model \_\_\_\_\_ ☐ Rim-mounted, resilient foam-filled  
 Date installed \_\_\_\_\_ ☐ Shoe-mounted  
 (month/year) \_\_\_\_\_ ☐ Weather shield  
 \_\_\_\_\_ ☐ Other, specify \_\_\_\_\_

45. Most recent seal inspection for visible holes, tears or other openings in the seal or fabric:

Seal(s) inspected \_\_\_\_\_  
 Date of inspection \_\_\_\_\_  
 Inspected by (person and company) \_\_\_\_\_  
 Condition of seal(s) ☐ Good condition  
☐ Needed repair or replacement, specify type and date of corrective action

46. Most recent seal gap measurements:

	<u>Primary Seal</u>	<u>Secondary Seal</u>
Date of measurement	_____	_____
By: (person)	_____	_____
(company)	_____	_____
Width of maximum gap	_____ inch	_____ inch
Total area of gaps	_____ sq in	_____ sq in
	_____ sq in/ft tank	_____ sq in/ft tank
	_____ diameter	_____ diameter

47. Condition of the interior side of the tank shell:

☐ Little or no rust      ☐ Dense rust      ☐ Gunite-lining

FOR OHIO EPA USE	
FACILITY ID _____	PTI# _____
EU ID _____	

## EMISSIONS ACTIVITY CATEGORY FORM

### ROADWAYS AND PARKING AREAS: FUGITIVE DUST EMISSIONS

*This form is to be completed for all Roadways and Parking Areas. State/Federal regulations which may apply to Roadways and Parking Areas are listed in the instructions. Note that there may be other regulations which apply to this emissions unit which are not included in this list.*

1. Reason this form is being submitted (Check one)

☐ New Permit    ☐ Renewal or Modification of Air Permit Number(s) (e.g. F001) \_\_\_\_\_

2. Maximum Operating Schedule: \_\_\_\_\_ hours per day; \_\_\_\_\_ days per year

If the schedule is less than 24 hours/day or 365 days/year, what limits the schedule to less than maximum? See instructions for examples. \_\_\_\_\_

3. Complete the table below for each road segment or parking area.

ID	Road Segment or Parking Area Description	Length (miles) or Area (ft <sup>2</sup> )	Year Installed	Surface Type (check one)	Surface Composition (check one)
A				<input type="checkbox"/> paved <input type="checkbox"/> unpaved	<input type="checkbox"/> asphalt <input type="checkbox"/> gravel <input type="checkbox"/> concrete <input type="checkbox"/> dirt <input type="checkbox"/> chip & seal <input type="checkbox"/> other
B				<input type="checkbox"/> paved <input type="checkbox"/> unpaved	<input type="checkbox"/> asphalt <input type="checkbox"/> gravel <input type="checkbox"/> concrete <input type="checkbox"/> dirt <input type="checkbox"/> chip & seal <input type="checkbox"/> other
C				<input type="checkbox"/> paved <input type="checkbox"/> unpaved	<input type="checkbox"/> asphalt <input type="checkbox"/> gravel <input type="checkbox"/> concrete <input type="checkbox"/> dirt <input type="checkbox"/> chip & seal <input type="checkbox"/> other
D				<input type="checkbox"/> paved <input type="checkbox"/> unpaved	<input type="checkbox"/> asphalt <input type="checkbox"/> gravel <input type="checkbox"/> concrete <input type="checkbox"/> dirt <input type="checkbox"/> chip & seal <input type="checkbox"/> other
E				<input type="checkbox"/> paved <input type="checkbox"/> unpaved	<input type="checkbox"/> asphalt <input type="checkbox"/> gravel <input type="checkbox"/> concrete <input type="checkbox"/> dirt <input type="checkbox"/> chip & seal <input type="checkbox"/> other
F				<input type="checkbox"/> paved <input type="checkbox"/> unpaved	<input type="checkbox"/> asphalt <input type="checkbox"/> gravel <input type="checkbox"/> concrete <input type="checkbox"/> dirt <input type="checkbox"/> chip & seal <input type="checkbox"/> other

FOR OHIO EPA USE	
FACILITY ID	_____
EU ID	_____ PTI# _____

4. Complete the table below for each paved road segment or parking area.

ID	Silt Loading (g/m <sup>2</sup> )	Vehicle Type	Avg. Weight (tons)	Avg. Speed (mph)	Vehicle Miles Traveled (vmt/yr)	Control Method(s)	Application or Usage Frequency
A						<input type="checkbox"/> sweeping <input type="checkbox"/> flushing <input type="checkbox"/> watering <input type="checkbox"/> good housekeeping <input type="checkbox"/> other: _____	
B						<input type="checkbox"/> sweeping <input type="checkbox"/> flushing <input type="checkbox"/> watering <input type="checkbox"/> good housekeeping <input type="checkbox"/> other: _____	
C						<input type="checkbox"/> sweeping <input type="checkbox"/> flushing <input type="checkbox"/> watering <input type="checkbox"/> good housekeeping <input type="checkbox"/> other: _____	
D						<input type="checkbox"/> sweeping <input type="checkbox"/> flushing <input type="checkbox"/> watering <input type="checkbox"/> good housekeeping <input type="checkbox"/> other: _____	
E						<input type="checkbox"/> sweeping <input type="checkbox"/> flushing <input type="checkbox"/> watering <input type="checkbox"/> good housekeeping <input type="checkbox"/> other: _____	
F						<input type="checkbox"/> sweeping <input type="checkbox"/> flushing <input type="checkbox"/> watering <input type="checkbox"/> good housekeeping <input type="checkbox"/> other: _____	

5. Identify all the places that the permittee's roadways and parking lots meet a public road. Use the Road Segment or Parking Area ID from the table above to identify the permittee's roadway and parking lots that are involved.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Describe how any foreign materials deposited on public paved roadways will be removed.

☐ Flushing with water  
 ☐ Wet sweeping  
 ☐ Sweeping with vacuum truck  
 ☐ Other. Describe \_\_\_\_\_



FOR OHIO EPA USE	
FACILITY ID _____	PTI# _____
EU ID _____	

6. Complete the table below for each unpaved road segment or parking area.

ID	Silt Content (%)	Surface Material Moisture Content (%)	Vehicle Type	Avg. Weight (tons)	Avg. Speed (mph)	Vehicle Miles Traveled (vmt/yr)	Control Method(s)	Application or Usage Frequency
A							<input type="checkbox"/> oiling <input type="checkbox"/> watering <input type="checkbox"/> surface improvement <input type="checkbox"/> chemical stabilization	
B							<input type="checkbox"/> oiling <input type="checkbox"/> watering <input type="checkbox"/> surface improvement <input type="checkbox"/> chemical stabilization	
C							<input type="checkbox"/> oiling <input type="checkbox"/> watering <input type="checkbox"/> surface improvement <input type="checkbox"/> chemical stabilization	
D							<input type="checkbox"/> oiling <input type="checkbox"/> watering <input type="checkbox"/> surface improvement <input type="checkbox"/> chemical stabilization	
E							<input type="checkbox"/> oiling <input type="checkbox"/> watering <input type="checkbox"/> surface improvement <input type="checkbox"/> chemical stabilization	
F							<input type="checkbox"/> oiling <input type="checkbox"/> watering <input type="checkbox"/> surface improvement <input type="checkbox"/> chemical stabilization	

7. The use of used oil for dust suppression is prohibited. Used oil is any oil that has been refined from crude oil, or any synthetic oil, that has been used, and, as a result of that use, is contaminated by physical or chemical impurities. See OAC rule 3745-279-01. Used oil does not include oils that have been refined from crude oil that have not been used or any synthetic oil that has not been used.

If oiling is being used for dust suppression, is only virgin oil being used?  
☐ Yes    ☐ No    ☐ Not using oil

FOR OHIO EPA USE	
FACILITY ID	_____
EU ID	PTI# _____

## EMISSIONS ACTIVITY CATEGORY FORM STATIONARY INTERNAL COMBUSTION ENGINE

*This form is to be completed for each stationary reciprocating or gas turbine engine. State/Federal regulations which may apply to stationary internal combustion engines are listed in the instructions. Note that there may be other regulations which apply to this emissions unit which are not included in this list.*

1. Reason this form is being submitted (Check one)

☐ New Permit      ☐ Renewal or Modification of Air Permit Number (e.g. P001)\_\_\_\_\_

2. Maximum Operating Schedule: \_\_\_\_\_ hours per day; \_\_\_\_\_ days per year

If the schedule is less than 24 hours/day or 365 days/year, what limits the schedule to less than maximum? See instructions for examples. \_\_\_\_\_

3. Engine type:      ☐ Gas turbine      ☐ Reciprocating

4. Purpose of engine: ☐ Driving pump or compressor      ☐ Driving electrical generator

5. Normal use of engine:      ☐ Emergency only      ☐ Non-emergency

6. Engine Manufacturer: \_\_\_\_\_ Model No: \_\_\_\_\_

7. Engine exhaust configuration:   
(for turbines only)      ☐ simple cycle *(no heat recovery)*  
☐ regenerative cycle *(heat recovery to preheat combustion air)*  
☐ cogeneration cycle *(heat recovered to produce steam)*  
☐ combined cycle *(heat recovered to produce steam which drives generator)*

8. Input capacities (million BTU/hr): Rated \_\_\_\_\_ Maximum \_\_\_\_\_ Normal \_\_\_\_\_

*Supplemental burner (duct burner) input capacity, if equipped (million BTU/hr):*

Rated: \_\_\_\_\_ Maximum \_\_\_\_\_ Normal \_\_\_\_\_

9. Output capacities (Horsepower): Rated: \_\_\_\_\_ Maximum \_\_\_\_\_ Normal \_\_\_\_\_

(Kilowatts): Rated: \_\_\_\_\_ Maximum \_\_\_\_\_ Normal \_\_\_\_\_

(lbs steam/hr)\*: Rated: \_\_\_\_\_ Maximum \_\_\_\_\_ Normal \_\_\_\_\_

\*required for cogeneration or combined cycle units only

FOR OHIO EPA USE		
FACILITY ID _____		PTI# _____
EU ID _____		

10. Type of ignition: ☐ non-spark (diesel) ☐ spark

11. Type of fuel fired (check all that apply):

- |                                      |   |                                      |                                       |
|--------------------------------------|---|--------------------------------------|---------------------------------------|
| <input type="checkbox"/> single fuel | <input type="checkbox"/> No. 2 oil, low-sulfur  | <input type="checkbox"/> natural gas | <input type="checkbox"/> landfill gas |
| <input type="checkbox"/> dual fuel   | <input type="checkbox"/> No. 2 oil, high-sulfur | <input type="checkbox"/> diesel      | <input type="checkbox"/> digester gas |
|                                      | <input type="checkbox"/> gasoline               | <input type="checkbox"/> propane     |                                       |
|                                      | <input type="checkbox"/> other, explain _____   |                                      |                                       |

12. Complete the following table for all fuels identified in question 11 that are used for the engine and any supplemental (duct) burners, if equipped:

Fuel	Heat Content (BTU/unit)	wt.% Ash	wt.% Sulfur	Fuel Usage		
				Estimated Maximum Per Year	Normal Per Hour	Max. Per Hour
Nat. gas	BTU/cu ft		gr/scf	cu ft	cu ft	cu ft
No. 2 oil	BTU/gal			gal	gal	gal
Gasoline	BTU/gal			gal	gal	gal
Diesel	BTU/gal			gal	gal	gal
Landfill/digester gas	BTU/cu ft		ppm	cu ft	cu ft	cu ft
Other (show units)						
List supplemental (duct) burner fuel and information below (show units):						

13. Type of combustion cycle (check all that apply):

- |   |  |
|---|--|
| <input type="checkbox"/> 2-stroke             | <input type="checkbox"/> 4-stroke      |
| <input type="checkbox"/> rich-burn            | <input type="checkbox"/> lean-burn     |
| <input type="checkbox"/> carbureted           | <input type="checkbox"/> fuel injected |
| <input type="checkbox"/> other, explain _____ |  |

14. Emissions control techniques (check all that apply):

- |   |  |
|---|--|
| <input type="checkbox"/> prestratified charge         | <input type="checkbox"/> nonselective catalytic reduction (NSCR) |
| <input type="checkbox"/> catalytic oxidation (CO)     | <input type="checkbox"/> selective catalytic reduction (SCR)     |
| <input type="checkbox"/> air/fuel ratio               | <input type="checkbox"/> injection timing retard (ITR)           |
| <input type="checkbox"/> 2-stage rich/lean combustion | <input type="checkbox"/> 2-stage lean/lean combustion            |
| <input type="checkbox"/> water/steam injection        | <input type="checkbox"/> preignition chamber combustion (PCC)    |
| <input type="checkbox"/> other, explain _____         |  |

For each emissions control technique checked above, explain what pollutants are controlled by each technique:

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## **B. Facility-Wide Terms and Conditions**

Natural Gas Extraction Well Site Production Line, 6/23/11 DRAFT GP

1. This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).
  - a) For the purpose of a permit-to-install document, the facility-wide terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.
    - (1) None.
  - b) For the purpose of a permit-to-operate document, the facility-wide terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.
    - (1) None.
2. The following emissions units contained in this permit are subject to 40 CFR Part 60, Subpart(s) A, Kb and JJJJ, and 40 CFR Part 63, Subpart(s) A, HH and ZZZZ: Storage Tanks, Stationary SI ICEs, TEG Dehydration Units and Flares. The complete NSPS/MACT requirements may be accessed via the internet from the Electronic Code of Federal Regulations (e-CFR) website <http://ecfr.gpoaccess.gov> or by contacting the appropriate Ohio EPA District Office or local air agency.
3. Air contaminant sources that qualify as de minimus under OAC rule 3745-15-05, or under OAC rule 3745-31-03(A)(1) or (4) for exemption or registered for a permit-by-rule (PBR), are not regulated under this permit, regardless of whether listed.
4. Emissions units permitted under a previously issued PTI/PTIO as portable sources, provided that the qualifying criteria for this General permit are met, shall be subject to the requirements of this permit during the time located at this well site.
5. The requirements of this permit are not intended to supersede any Ohio Department of Natural Resources requirements.
6. No equipment other than that listed in this permit, which would constitute an air contaminant source, shall be installed or utilized on site. The permittee shall maintain an annual record of the equipment in use on site, and submit an annual report describing the equipment in use during the last year.
7. Modeling to demonstrate compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F)(4)(b), was not necessary because the maximum annual emissions for each toxic air contaminant, as defined in OAC rule 3745-114-01, will be less than 1.0 ton per year. OAC Chapter 3745-31 requires permittees to apply for and obtain a new or modified PTIO prior to making a "modification" as defined by OAC rule 3745-31-01. The permittee is hereby advised that changes in the composition of the materials, or use of new materials, that would cause the emissions of any toxic air contaminant to increase to above 1.0 ton per year may require the permittee to apply for and obtain a new PTIO.
8. The permittee remains subject to all applicable federal law and regulations and all applicable provisions of the Ohio State Implementation Plan as approved by the Administrator of the U.S. EPA. The provisions of the Ohio State Implementation Plan are independently enforceable by the U.S. EPA.

## **C. Emissions Unit Terms and Conditions**





1. Emissions Unit: Natural Gas Production System, P001

Operations, Property and/or Equipment Description:

P001	Natural gas handling system consisting of any/all of the following: gas-oil/condensate and/or gas-water separators, natural gas-fired heaters/boilers of various types ( $\leq 4.89$ MMBtu/hr total), equipment/pipeline leaks and dehydration (may incorporate vapor recovery (VR) or combustion controls on site).
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a) This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).

(1) For the purpose of a permit-to-install document, the emissions unit terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.

a. None.

(2) For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.

a. None.

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	ORC 3704.03(T)	Emissions of Volatile Organic Compounds (VOC) shall not exceed: 0.127 ton/year total from heaters; 9.72 tons/year total from fugitive equipment leaks; and 3.68 tons/year total from dehydration.
b.	OAC rule 3745-31-05(A)(3), as effective 11/30/01	Emissions of Sulfur Dioxide (SO <sub>2</sub> ) shall not exceed 0.0184 lb/hr and 0.0805 ton/year total from heaters.  Emissions of Carbon Monoxide (CO) shall not exceed 0.402 lb/hr and 1.76 tons/year total from heaters.  Emissions of Nitrogen Oxides (NO <sub>x</sub> ) shall not exceed 0.475 lb/hr and 2.08 tons/year total from heaters.

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	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		Particulate Emissions (PE)/PM10/PM2.5 shall not exceed 0.0297 lb/hr and 0.13 ton/year total from heaters.  Visible emissions shall not exceed 0 percent Opacity as a six-minute average.  See b)(2)a.
c.	OAC rule 3745-31-05(A)(3)(a)(ii), as effective 12/01/06	See b)(2)b.
d.	OAC rule 3745-17-07(A)(1)(a)	The emissions limitation established by this rule is less stringent than the limitation established under OAC rule 3745-31-05(A)(3); Visible emissions shall not exceed 20 percent opacity as a six-minute average, except as provided by rule.
e.	OAC rule 3745-17-10(B)(1)	The emissions limitation established by this rule is less stringent than the limitation established under OAC rule 3745-31-05(A)(3); 0.02 lb of particulate per MMBtu of actual heat input.
f.	40 CFR Part 63, Subpart HH	Glycol (TEG) Dehydrators shall meet any applicable MACT requirements.

(2) Additional Terms and Conditions

- a. The permittee has satisfied the Best Available Technology (BAT) requirements pursuant to OAC paragraph 3745-31-05(A)(3), as effective November 30, 2001, in this permit. On December 1, 2006, paragraph (A)(3) of OAC rule 3745-31-05 was revised to conform to ORC changes effective August 3, 2006 (S.B. 265 changes), such that BAT is no longer required by State regulation for NAAQS pollutant less than ten tons per year. However, that rule revision has not yet been approved by U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). Therefore, until the SIP revision occurs and the U.S. EPA approves the revision to OAC rule 3745-31-05, the requirement to satisfy BAT still exists as part of the federally-approved SIP for Ohio. Once U.S. EPA approves the December 1, 2006 version of 3745-31-05, then these emission limits/control measures no longer apply.
- b. These rule paragraphs apply once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 as part of the State Implementation Plan.
  - i. The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the Sulfur Dioxide (SO<sub>2</sub>), Nitrogen Oxides (NO<sub>x</sub>), Particulate Emissions (PE) and Carbon Monoxide (CO)

from this air contaminant source since the uncontrolled potential to emit for SO<sub>2</sub>, NO<sub>x</sub>, PE and CO are less than ten tons per year.

- c. The annual emissions limitations above represent the emissions units' potential to emit. Therefore, no monitoring, record keeping and/or reporting requirements are necessary to ensure compliance with the emissions limitations.
- c) Operational Restrictions
  - (1) None.
- d) Monitoring and/or Recordkeeping Requirements
  - (1) None.
- e) Reporting Requirements
  - (1) Annual Permit Evaluation Report (PER) forms will be mailed to the permittee at the end of the reporting period specified in the Authorization section of this permit. The permittee shall submit the PER in the form and manner provided by the director by the due date identified in the Authorization section of this permit. The permit evaluation report shall cover a reporting period of no more than twelve-months for each air contaminant source identified in this permit.
- f) Testing Requirements
  - (1) Compliance with the emission limitations specified in b)(1) of these terms and conditions shall be determined in accordance with the following methods:
    - a. Emissions Limitation:

Emissions of VOC shall not exceed 0.127 ton/year total from heaters; 9.72 tons/year total from fugitive equipment leaks; and 3.68 tons/year total from dehydration.

Applicable Compliance Method:

The VOC limitations were established for purposes of this permit, through a one-time calculation of the potential-to-emit, based upon information supplied in the permittee's application.
    - b. Emissions Limitation:

Emissions of Sulfur Dioxide (SO<sub>2</sub>) shall not exceed 0.0184 lb/hr and 0.0805 ton/year total from heaters.

Applicable Compliance Method:

The SO<sub>2</sub> limitation was established for purposes of this permit, through a one-time calculation of the potential-to-emit, based upon information supplied in the permittee's application.

Emissions Limitation:

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Emissions of Carbon Monoxide (CO) shall not exceed 0.402 lb/hr and 1.76 tons/year total from heaters.

Applicable Compliance Method:

The CO limitation was established for purposes of this permit, through a one-time calculation of the potential-to-emit, based upon information supplied in the permittee's application.

c. Emissions Limitation:

Emissions of Nitrogen Oxides (NOx) shall not exceed 0.475 lb/hr and 2.08 tons/year total from heaters.

Applicable Compliance Method:

The NOx limitation was established for purposes of this permit, through a one-time calculation of the potential-to-emit, based upon information supplied in the permittee's application.

d. Emissions Limitation:

PE/PM10/PM2.5 emissions shall not exceed 0.0297 lb/hr and 0.13 ton/year total from heaters.

Applicable Compliance Method:

The PE limitation was established for purposes of this permit, through a one-time calculation of the potential-to-emit, based upon information supplied in the permittee's application.

e. Emissions Limitation:

Visible PE shall not exceed 20 percent opacity as a six-minute average, except as provided by rule.

Applicable Compliance Method:

If required, visible particulate emissions shall be determined according to USEPA Method 9 in 40 CFR, Part 60, Appendix A.

f. Emissions Limitation:

0.02 lb of particulate per MMBtu of actual heat input.

Applicable Compliance Method:

If required, particulate emissions shall be determined according to USEPA Method 5.

g) Miscellaneous Requirements

(1) None.

**2. Emissions Units: Spark Ignition Internal Combustion Engines, B001 and B002**

**Operations, Property and/or Equipment Description:**

B001	215 horsepower (HP) natural gas, stationary spark ignition (SI) internal combustion engine (ICE)
B002	215 horsepower (HP) natural gas, stationary spark ignition (SI) internal combustion engine (ICE)

- a) This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).
- (1) For the purpose of a permit-to-install document, the emissions unit terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.
- (a) None.
- (2) For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.
- (a) None.
- b) Applicable Emissions Limitations and/or Control Requirements
- (1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	40 CFR Part 60, Subpart JJJJ In accordance with 40 CFR 60.4230, this emissions unit is subject to the New Source Performance Standards (NSPS) for Stationary Spark Ignition (SI) Internal Combustion Engines (ICE). 40 CFR 60.4233(e) Table 1 to Part 60, Subpart JJJJ	The exhaust emissions shall not exceed: 2.0 grams of nitrogen oxides per horsepower hour (2.0 g NOx/HP-hr) or 160 ppmvd at 15% O <sub>2</sub> ; 4.0 grams of carbon monoxide per horsepower hour (4.0 g CO/HP-hr) or 540 ppmvd at 15% O <sub>2</sub> ; and 1.0 grams of volatile organic compounds per horsepower hour (1.0 g VOC/HP-hr) or 86 ppmvd at 15% O <sub>2</sub> . See b)(2)c. and d.

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b.	OAC rule 3745-17-11(B)(5)(a)	The limit specified by this rule is less stringent than the limit established under OAC rule 3745-31-05(A)(3);  0.310 lb PE/MMBtu of actual heat input.
c.	OAC rule 3745-18-04(F)(4)	Per rule, the SO <sub>2</sub> emission rate from natural gas shall be considered to be equal to 0.0 lb/MMBtu.
d.	OAC rule 3745-17-07(A)(1)	The emissions limitation established by this rule is less stringent than the limitation established under OAC rule 3745-31-05(A)(3);  Visible emissions shall not exceed 20 percent opacity as a six-minute average, except as provided by rule.
e.	OAC rule 3745-31-05(A)(3), as effective 11/30/01	Emissions from each engine shall not exceed:  0.03 lb particulate emissions (PE) per hour and 0.14 ton PE/year;  0.95 lb nitrogen oxides (NO <sub>x</sub> ) per hour and 4.15 tons NO <sub>x</sub> /year;  1.90 lbs carbon monoxide (CO) per hour and 8.30 tons CO/year;  0.47 lb volatile organic compounds (VOC) per hour and 2.08 tons VOC/year; and  0.001 lb sulfur dioxide (SO <sub>2</sub> ) per hour and 0.004 ton SO <sub>2</sub> /year.  Visible emissions shall not exceed 5 percent opacity as a six-minute average.  See b)(2)a.
f.	OAC rule 3745-31-05(A)(3)(a)(ii), as effective 12/01/06	See b)(2)b.
g.	40 CFR 63 Subpart ZZZZ  40 CFR 63.6590(c)(1)	A new or reconstructed area source operating in compliance with Part 60 Subpart JJJJ is the demonstration of compliance for 40 CFR 63 Subpart ZZZZ.

(2) Additional Terms and Conditions

- a. The permittee has satisfied the Best Available Technology (BAT) requirements pursuant to OAC rule 3745-31-05(A)(3), as effective November 30, 2001, in this permit. On December 1, 2006, paragraph (A)(3) of OAC rule 3745-31-05 was revised to conform to the Ohio Revised Code (ORC) changes effective August 3, 2006 (Senate Bill 265 changes), such that BAT is no longer required by State regulations for National Ambient Air Quality Standard (NAAQS) pollutant(s) less

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than ten tons per year. However, that rule revision has not yet been approved by U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). Therefore, until the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-31-05, the requirement to satisfy BAT still exists as part of the federally-approved SIP for Ohio. Once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 these emission limitations/control measures no longer apply.

- b. These rules apply once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 as part of the State Implementation Plan.

The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the PE, NO<sub>x</sub>, CO, VOC, and SO<sub>2</sub> emissions from this air contaminant source since the uncontrolled potential to emit for PE, NO<sub>x</sub>, CO, VOC, and SO<sub>2</sub> are less than ten tons per year.

- c. The stationary spark ignition (SI) internal combustion engines (ICE) are subject to and shall be operated in compliance with the requirements of 40 CFR Part 60, Subpart JJJJ, the standards of performance for stationary SI ICE.

[40 CFR 60.4230(a)]

- d. The stationary SI ICE has been or shall be purchased certified by the manufacturer to emission standards as stringent as those identified in 40 CFR 60.4233(e) and found in Table 1 of Part 60, Subpart JJJJ for engines greater than or equal to 100 HP and less than 500 HP and manufactured on/after 7/1/08 and before 1/1/11.

[40 CFR 60.4233(e)] and [40 CFR 60.4231(e)]

c) Operational Restrictions

- (1) The stationary SI ICE shall be installed, operated, and maintained according to the manufacturer's specifications, written instructions, and procedures over the entire life of the engines. The permittee shall operate and maintain the stationary SI ICE to achieve the emission standards identified in 40 CFR 60.4233(e) and found in Table 1 of NSPS Subpart JJJJ over the entire life of the engines. The air-to-fuel ratio controllers shall be set by the manufacturer and/or according to the operations manual, to ensure proper operation of the engines and their control device (catalytic converter) and to minimize emissions.

[40 CFR 60.4234], [40 CFR 60.4243(b)(1)], and [40 CFR 60.4243(g)]

- (2) During emergency conditions the permittee may operate these engines using propane for a maximum of 100 hours each per year, as an alternative fuel, and if records are maintained for such use. If the engine was not certified to burn propane the permittee shall conduct a performance test to demonstrate compliance with the emission standards in 40 CFR 60.4233.

[40 CFR 60.4243(e)]

d) Monitoring and/or Recordkeeping Requirements

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- (1) The permittee shall maintain the manufacturer's certification on site or at a central location for all facility ICE and it shall be made available for review upon request. If the manufacturer's certification is not kept on site, the permittee shall maintain a log for the location of each ICE and it shall identify the agency-assigned emissions unit number, the manufacturer's identification number, and the identification number of the certificate. The manufacturer's operations manual shall be maintained at the same location as the ICE.

[40 CFR 60.4243(b)(1)]

- (2) The permittee shall maintain the following records and make them available upon request:
  - a. all notifications submitted to comply with and all documentation supporting compliance with Part 60 Subpart JJJJ;
  - b. records of all maintenance conducted on the engines;
  - c. the certification from the manufacturer, documenting that the engines are certified to meet the emission standards identified in 40 CFR 60.4231(e); and
  - d. the information identified in 40 CFR parts 90, 1048, 1054, and/or 1060 that is required to be provided by the manufacturer to the operator/owner, as applicable to the model year and horsepower of the engines.

[40 CFR 60.4245(a)]

e) Reporting Requirements.

- (1) Annual Permit Evaluation Report (PER) forms will be mailed to the permittee at the end of the reporting period specified in the Authorization section of this permit. The permittee shall submit the PER in the form and manner provided by the Director by the due date identified in the Authorization section of this permit. The permit evaluation report shall cover a reporting period of no more than twelve months for each air contaminant source identified in this permit.

[OAC 3745-15-03(B)(2) and (D)]

f) Testing Requirements

- (1) Compliance with the emission limitations in b)(1) of these terms and conditions shall be determined in accordance with the following methods:

a. Opacity Limitation:

Visible emissions shall not exceed 5 percent opacity as a six-minute average.

Visible emissions shall not exceed 20 percent opacity as a six-minute average, except as provided by rule.

Applicable Compliance Method:



If required, compliance shall be determined through visible emission observations performed in accordance with U.S. EPA Reference Method 9 in 40 CFR, Part 60, Appendix A.

b. Emission Limitations:

0.03 lb PE/hr

0.14 tons PE/year

Applicable Compliance Method:

The PE emissions limit was established based on the AP-42 emission factor of 0.01941 lb PM/MMBtu from Chapter 3.2 for Natural Gas-fired Reciprocating Engines, Table 3.2-3, "Uncontrolled Emission Factors for 4-Stroke Rich-Burn Engines". The limitation includes both filterable and condensable PM.

Compliance with the ton per year PE emissions limitation shall be determined by the following calculation:

$$0.01941 \text{ lb PE/MMBtu} \times 1.702 \text{ MMBtu/hr} = 0.033 \text{ lb PE/hr}$$

$$0.033 \text{ lb PE/hr} \times 8760 \text{ hrs/yr} \times 1 \text{ ton/2000 lbs} = 0.14 \text{ tons/year}$$

If required, the permittee shall demonstrate compliance with the pound per hour emission limitations through exhaust emission tests performed in accordance with 40 CFR Part 60, Appendix A, Methods 1 through 5, including condensables.

c. Emission Limitations:

2.0 grams NO<sub>x</sub> /HP-hr or 160 ppmvd at 15% O<sub>2</sub>

0.95 lb NO<sub>x</sub>/hr

4.15 tons NO<sub>x</sub>/year

Applicable Compliance Method:

Compliance with the emission limitations shall be based on the manufacturer's certification to the emission standards identified in 40 CFR 60.4231(e) and by maintaining the engines according to the manufacturer's specifications. The g/HP-hr limit is the emission limitation from Table 1 to Part 60 Subpart JJJJ, the exhaust emission standards for natural gas engines greater than or equal to 100 HP and less than 500 HP, manufactured on/after 7/1/08 and before 1/1/11.

Compliance with the ton per year NO<sub>x</sub> emissions limitation shall be determined by the following calculation:

$$2.0 \text{ g NO}_x/\text{HP-hr} \times 215 \text{ HP} \times 1\text{lb}/453.59 \text{ g} = 0.948 \text{ lb NO}_x/\text{hr}$$

$$0.948 \text{ lb NO}_x/\text{hr} \times 8760 \text{ hrs/yr} \times 1 \text{ ton/2000 lbs} = 4.15 \text{ tons NO}_x/\text{year}$$

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If required, the permittee shall demonstrate compliance with the NO<sub>x</sub> limitation according the requirements of 40 CFR 60.4244, using the applicable test methods in Table 2 to Part 60 Subpart JJJJ.

[40 CFR 60.4233(e)], [40 CFR 60.4244], and [Table 1 to Part 60 Subpart JJJJ]

d. Emission Limitations:

4.0 grams CO/HP-hr or 540 ppmvd at 15% O<sub>2</sub>

1.90 lbs CO/hr

8.3 tons CO/year

Applicable Compliance Method:

Compliance with the emission limitations shall be based on the manufacturer's certification to the emission standards identified in 40 CFR 60.4231(e) and by maintaining the engines according to the manufacturer's specifications. The g/HP-hr limit is the emission limitation from Table 1 to Part 60 Subpart JJJJ, the exhaust emission standards for natural gas engines greater than or equal to 100 HP and less than 500 HP, manufactured on/after 7/1/08 and before 1/1/11.

Compliance with the ton per year CO emissions limitation shall be determined by the following calculation:

$$4.0 \text{ g CO/HP-hr} \times 215 \text{ HP} \times 1\text{lb}/453.59 \text{ g} = 1.90 \text{ lbs CO/hr}$$

$$1.90 \text{ lbs CO/hr} \times 8760 \text{ hrs/yr} \times 1 \text{ ton}/2000 \text{ lbs} = 8.3 \text{ tons CO/year}$$

If required, the permittee shall demonstrate compliance with the CO limitation according the requirements of 40 CFR 60.4244, using the applicable test methods in Table 2 to Part 60 Subpart JJJJ.

[40 CFR 60.4233(e)], [40 CFR 60.4244], and [Table 1 to Part 60 Subpart JJJJ]

e. Emission Limitations:

1.0 grams VOC/HP-hr or 86 ppmvd at 15% O<sub>2</sub>

0.474 lb VOC/hr

2.08 tons VOC/year

Applicable Compliance Method:

Compliance with the emission limitations shall be based on the manufacturer's certification to the emission standards identified in 40 CFR 60.4231(e) and by maintaining the engines according to the manufacturer's specifications. The g/HP-hr limit is the emission limitation from Table 1 to Part 60 Subpart JJJJ, the exhaust emission standards for natural gas engines greater than or equal to 100 HP and less than 500 HP, manufactured on/after 7/1/08 and before 1/1/11.

Compliance with the ton per year VOC emissions limitation shall be determined by the following calculation:

$$1.0 \text{ g VOC/HP-hr} \times 215 \text{ HP} \times 1\text{lb}/453.59 \text{ g} = 0.474 \text{ lb VOC/hr}$$

$$0.474 \text{ lb VOC/hr} \times 8760 \text{ hrs/yr} \times 1 \text{ ton}/2000 \text{ lbs} = 2.08 \text{ tons VOC/year}$$

If required, the permittee shall demonstrate compliance with the VOC limitation according the requirements of 40 CFR 60.4244, using the applicable test methods in Table 2 to Part 60 Subpart JJJJ.

[40 CFR 60.4233(e)], [40 CFR 60.4244], and [Table 1 to Part 60 Subpart JJJJ]

f. Emission Limitations:

0.001 lb SO<sub>2</sub>/hr

0.004 tons of SO<sub>2</sub>/year

Applicable Compliance Method:

The SO<sub>2</sub> emissions limit was established based on the AP-42 emission factor of 0.000588 lb SO<sub>2</sub>/MMBtu from Chapter 3.2 for Natural Gas-fired Reciprocating Engines, Table 3.2-1 through 3, "Uncontrolled Emission Factors for all natural gas Engines".

Compliance with the ton per year SO<sub>2</sub> emissions limitation shall be determined by the following calculation:

$$0.000588 \text{ lb SO}_2\text{/MMBtu} \times 1.702 \text{ MMBtu/hr} = 0.001 \text{ lb SO}_2\text{/hr}$$

$$0.001 \text{ lb SO}_2\text{/hr} \times 8760 \text{ hrs/yr} \times 1 \text{ ton}/2000 \text{ lbs} = 0.004 \text{ tons/year}$$

g) Miscellaneous Requirements

(1) None.

3. Emissions Unit: Unpaved Roadways, F001

Operations, Property and/or Equipment Description:

F001	Unpaved Roadways
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- a) This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).
- (1) For the purpose of a permit-to-install document, the emissions unit terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.
- (a) None.
- (2) For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.
- (a) None.

b) Applicable Emissions Limitations and/or Control Requirements

- (1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-05(A)(3), as effective 11/30/01	Emissions of fugitive dust shall not exceed: 0.053 ton/year of fugitive particulate matter of 2.5 microns or less (PM <sub>2.5</sub> ); 0.53 ton/year of fugitive particulate matter of 10 microns or less (PM <sub>10</sub> ); 1.8 tons/year of fugitive particulate emissions (PE); and There shall be no visible emissions except for 3 minutes during any 60-minute period. Best available control measures that are sufficient to minimize or eliminate visible emissions of fugitive dust shall be used. See b)(2)a. through b)(2)f. See b)(2)g.

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	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
b.	OAC rule 3745-31-05(A)(3)(a)(ii), as effective 12/01/06	See b)(2)h.
c.	OAC rule 3745-17-07(B)(5) (applicable only if this emissions unit is located in an area identified in Appendix A of OAC rule 3745-17-08)	The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3).  No visible PE from any unpaved roadway or parking area except for a period of time not to exceed thirteen minutes during any 60-minute observation period.
d.	OAC rule 3745-17-08(B) (applicable only if this emissions unit is located in an area identified in Appendix A of OAC rule 3745-17-08)	See b)(2)a. through b)(2)f.

(2) Additional Terms and Conditions

- a. The permittee shall employ best available control measures on all unpaved roadways and parking areas for the purpose of ensuring compliance with the above-mentioned applicable requirements. In accordance with the permittee's application, the permittee has committed to treat the unpaved roadways and parking areas by application of chemical stabilization/dust suppressants and/or watering at sufficient treatment frequencies to ensure compliance. Nothing in this paragraph shall prohibit the permittee from employing other control measures to ensure compliance.
- b. The needed frequencies of implementation of the control measures shall be determined by the permittee's inspections pursuant to the monitoring section of this permit. Implementation of the control measures shall not be necessary for unpaved roadways and parking areas that are covered with snow and/or ice or if precipitation has occurred that is sufficient for that day to ensure compliance with the above-mentioned applicable requirements. Implementation of any control measure may be suspended if unsafe or hazardous driving conditions would be created by its use.
- c. The permittee shall promptly remove, in such a manner as to minimize or prevent resuspension, earth and/or other material from paved streets onto which such material has been deposited by trucking or earth moving equipment or erosion by water or other means.
- d. Any unpaved roadway or parking area that is subsequently paved will require a General Permit for paved roadways and parking areas.

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- e. Open-bodied vehicles transporting materials likely to become airborne shall have such materials covered at all times if the control measure is necessary for the materials being transported.
- f. Implementation of the above-mentioned control measures in accordance with the terms and conditions of this permit is appropriate and sufficient to satisfy the best available technology requirements of OAC rule 3745-31-05.
- g. The permittee has satisfied the Best Available Technology (BAT) requirements pursuant to OAC rule 3745-31-05(A)(3), as effective November 30, 2001, in this permit. On December 1, 2006, paragraph (A)(3) of OAC rule 3745-31-05 was revised to conform to the Ohio Revised Code (ORC) changes effective August 3, 2006 (Senate Bill 265 changes), such that BAT is no longer required by State regulations for National Ambient Air Quality Standard (NAAQS) pollutant(s) less than ten tons per year. However, that rule revision has not yet been approved by U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). Therefore, until the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-31-05, the requirement to satisfy BAT still exists as part of the federally-approved SIP for Ohio. Once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 these emission limitations/control measures no longer apply.
- h. These rules apply once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 as part of the State Implementation Plan.

This PTIO takes into account the following voluntary restrictions (including the use of any applicable air pollution control equipment) as proposed by the permittee for the purposes of avoiding BAT requirements under OAC rule 3745-31-05(A)(3) for particulate emissions.

Control measures identified in terms b)(2)a. through b)(2)f.

c) Operational Restrictions

- (1) None.

d) Monitoring and/or Recordkeeping Requirements

- (1) Except as otherwise provided in this section, the permittee shall perform inspections of each of the roadway segments and parking areas in accordance with the following frequencies:

<u>unpaved roadways and parking areas</u>	<u>minimum inspection frequency</u>
all roads and parking areas	daily

The purpose of the inspections is to determine the need for implementing the above-mentioned control measures. The inspections shall be performed during representative, normal traffic conditions. No inspection shall be necessary for a roadway or parking area that is covered with snow and/or ice or if precipitation has occurred that is sufficient for that day to ensure compliance with the above-mentioned applicable requirements. Any required inspection that is not performed due to any of the above-identified events

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shall be performed as soon as such event(s) has (have) ended, except if the next required inspection is within one week.

- (2) The permittee shall maintain records of the following information:
- the date and reason any required inspection was not performed, including those inspections that were not performed due to snow and/or ice cover or precipitation;
  - the date of each inspection where it was determined by the permittee that it was necessary to implement the control measures;
  - the dates the control measures were implemented; and
  - on a calendar quarter basis, the total number of days the control measures were implemented and the total number of days where snow and/or ice cover or precipitation were sufficient to not require the control measures.

The information required in Term d)(2)d. shall be updated on a calendar quarter basis within 30 days after the end of each calendar quarter.

e) Reporting Requirements

- (1) Annual Permit Evaluation Report (PER) forms will be mailed to the permittee at the end of the reporting period specified in the Authorization section of this permit. The permittee shall submit the PER in the form and manner provided by the director by the due date identified in the Authorization section of this permit. The permit evaluation report shall cover a reporting period of no more than twelve-months for each air contaminant source identified in this permit.

[OAC 3745-15-03(B)(2) and (D)]

f) Testing Requirements

- (1) Compliance with the emission limitations in Term b)(1) shall be determined in accordance with the following methods:

a. Emission Limitations:

0.053 ton/year of fugitive PM<sub>2.5</sub>

0.53 ton/year of fugitive PM<sub>10</sub>

1.8 tons/year of fugitive PE

Applicable Compliance Method:

Compliance with fugitive PE and PM<sub>10</sub> limitations shall be determined by using the emission factor equations in Section 13.2.2, in Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume 1 (revised 11/06) for unpaved roadways. Should further updates in AP-42 occur, the most current equations for unpaved roads shall be used. The ton per year emission limits are based on a

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maximum of 10,000 vehicle miles traveled per year and a 95% control efficiency for PE, PM<sub>10</sub>, and PM<sub>2.5</sub>.

$$E = [k(s/12)^a(W/3)^b [(365-p)/365]]$$

Where:

E = size-specific emission factor (lbs PM<sub>10</sub>/VMT)

VMT= vehicle miles traveled per year

s = silt content of road surface material (%) = 10.0 %\*

W = mean vehicle weight (tons) = 25

p = 130 number of rain days per year

a = 0.9 for PM<sub>10</sub> and PM<sub>2.5</sub> (dimensionless constant)\*

a = 0.7 for PM (dimensionless constant)\*

b = 0.45 for PM, PM<sub>10</sub>, and PM<sub>2.5</sub> (dimensionless constant)\*

k = 0.15 lb/VMT for PM<sub>2.5</sub> \*

k = 1.5 lbs/VMT for PM<sub>10</sub> \*

k = 4.9 lbs/VMT for PM \*

Therefore:

$$E = 0.15 \text{ lb PM}_{2.5}/\text{VMT} \times (10/12)^{0.9} \times (25/3)^{0.45} \times (365-130/365)$$

$$E = 0.15 \text{ lb PM}_{2.5}/\text{VMT} \times 0.85 \times 2.60 \times 0.644$$

$$E = 0.213 \text{ lb PM}_{2.5}/\text{VMT}$$

$$E = 1.5 \text{ lbs PM}_{10}/\text{VMT} \times (10/12)^{0.9} \times (25/3)^{0.45} \times (365-130/365)$$

$$E = 1.5 \text{ lbs PM}_{10}/\text{VMT} \times 0.85 \times 2.60 \times 0.644$$

$$E = 2.13 \text{ lbs PM}_{10}/\text{VMT}$$

$$E = 4.9 \text{ lbs PM}/\text{VMT} \times (10/12)^{0.7} \times (25/3)^{0.45} \times (365-130/365)$$

$$E = 4.9 \text{ lbs PM}/\text{VMT} \times 0.88 \times 2.60 \times 0.644$$

$$E = 7.22 \text{ lbs PM}/\text{VMT}$$

Maximum travel = 10,000 VMT/year

$$(10,000 \text{ VMT/yr})(0.213 \text{ lbs PM}_{10}/\text{VMT})(1 \text{ ton}/2000 \text{ lbs}) = 1.065 \text{ tons of PM}_{2.5} / \text{year}$$

$$(10,000 \text{ VMT/yr})(2.13 \text{ lbs PM}_{10}/\text{VMT})(1 \text{ ton}/2000 \text{ lbs}) = 10.65 \text{ tons of PM}_{10} / \text{year}$$



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$$(10,000 \text{ VMT/yr})(7.22 \text{ lbs PM/VMT})(1 \text{ ton}/2000 \text{ lbs}) = 36.1 \text{ tons of PM/year}$$

Assuming 95% control for roadway watering:

$$(1.065 \text{ tons/year})(0.05) = 0.053 \text{ ton of controlled PM}_{2.5}/\text{year}$$

$$(10.65 \text{ tons/year})(0.05) = 0.53 \text{ ton of controlled PM}_{10}/\text{year}$$

$$(36.1 \text{ tons/year})(0.05) = 1.8 \text{ tons of controlled PM/year}^{**}$$

\* AP-42 factors

\*\* PM = PE

b. Emission Limitation:

No visible PE from unpaved roadways and parking areas except for a period of time not to exceed 3 minutes during any 60-minute observation period.

No visible PE from any unpaved roadway or parking area except for a period of time not to exceed thirteen minutes during any 60-minute observation period.

Applicable Compliance Method:

If required, compliance with the visible PE limitation listed above shall be determined in accordance with Test Method 22 as set forth in "Appendix on Test Methods" in 40 CFR, Part 60 ("Standards of Performance for New Stationary Sources").

g) Miscellaneous Requirements

(1) None.

4. Emissions Unit: Loading Rack, J001

Operations, Property and/or Equipment Description:

J001	Loading rack for natural gas condensate
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- a) This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).

- (1) For the purpose of a permit-to-install document, the emissions unit terms and conditions in this permit are federally enforceable, with the exception of those listed below, which are enforceable under state law only.

a. None.

- (2) For the purpose of a permit-to-operate document, the emissions unit terms and conditions in this permit are enforceable under state law only, with the exception of those listed below, which are federally enforceable.

a. None.

- b) Applicable Emissions Limitations and/or Control Requirements

- (1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	ORC 3704.03(T)	VOC emissions shall not exceed 24.9 tons/year.

- (2) Additional Terms and Conditions

- a. The annual VOC emission limitation above represents the emissions units' potential to emit. Therefore, no monitoring, record keeping and/or reporting requirements are necessary to ensure compliance with this emission limitation.

- c) Operational Restrictions

- (1) All loading operations performed at emissions unit J001 shall employ submerged or bottom fill.

- d) Monitoring and/or Recordkeeping Requirements

- (1) The permittee shall record the annual throughput, in gallons per year.

- e) Reporting Requirements

- (1) Annual Permit Evaluation Report (PER) forms will be mailed to the permittee at the end of the reporting period specified in the Authorization section of this permit. The permittee shall submit the PER in the form and manner provided by the director by the due date identified in the Authorization section of this permit. The permit evaluation report shall cover a reporting period of no more than twelve-months for each air contaminant source identified in this permit.

f) Testing Requirements

- (1) Compliance with the emission limitations shall be determined in accordance with the following methods:

Emission Limitation:

24.9 tons VOC/year

Applicable Compliance Method:

The emission limitation above was established by multiplying a loading loss factor (L\*) by the maximum pump capacity and by 60, and then dividing by 1000 for each day of operation during a calendar year.

The loading loss factor was derived using AP-42, Section 5.2, "Loading Loss Equation".

$$*L = 12.46 \text{ SPM/T}$$

Where:

L = loading loss, pounds per 1000 gallons loaded (Q)

S = saturation factor, 0.6 for submerged fill

P = vapor pressure of liquid loaded, pounds per square inch absolute

M = molecular weight of vapor

T = temperature of bulk liquid (°R)

$$MW = 66$$

$$P @ 61^{\circ}\text{F} = 6.02$$

$$\text{Submerged Fill Factor} = 0.6$$

$$\text{Temperature} = 520.67^{\circ}\text{R}$$

$$8,736,000 \frac{\text{gal}}{\text{year}} * \frac{5.7 \text{ lb VOC}}{1000 \text{ gal}} * \frac{1 \text{ ton}}{2000 \text{ lb}} = 24.9 \text{ tons} \frac{\text{VOC}}{\text{year}}$$

g) Miscellaneous Requirements

- (1) None.

5. Emissions Unit Group - Condensate storage tanks: T001, T002, T003 and T004

EU ID	Operations, Property and/or Equipment Description
T001	16,800 gallon vertical fixed roof storage tank (with/without enclosed flare)
T002	16,800 gallon vertical fixed roof storage tank (with/without enclosed flare)
T003	16,800 gallon vertical fixed roof storage tank (with/without enclosed flare)
T004	16,800 gallon vertical fixed roof storage tank (with/without enclosed flare)

- a) This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).

- (1) For the purpose of a permit-to-install document, the emissions unit terms and conditions in this permit are federally enforceable, with the exception of those listed below, which are enforceable under state law only.

a. None.

- (2) For the purpose of a permit-to-operate document, the emissions unit terms and conditions in this permit are enforceable under state law only, with the exception of those listed below, which are federally enforceable.

a. None.

- b) Applicable Emissions Limitations and/or Control Requirements

- (1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-05(A)(3), as effective 11/30/01	VOC emissions shall not exceed 3.3 tons/year.  See b)(2)a. and b)(2)b.
b.	OAC rule 3745-31-05(A)(3)(a)(ii), as effective 12/01/06	See b)(2)c.
c.	40 CFR 60 Subpart Kb	See b)(2)d.
d.	OAC Rule 3745-21-09(L)(2)(b)	See b)(2)e.

- (2) Additional Terms and Conditions

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- a. The Best Available Technology (BAT) requirements for this emission unit have been determined to be submerged fill and/or vapor balance. This emissions unit may employ gas combustion/flare control, as needed.
  - b. The permittee has satisfied the Best Available Technology (BAT) requirements pursuant to OAC rule 3745-31-05(A)(3), as effective November 30, 2001, in this permit. On December 1, 2006, paragraph (A)(3) of OAC rule 3745-31-05 was revised to conform to ORC changes effective August 3, 2006 (S.B. 265 changes), such that BAT is no longer required by State regulations for NAAQS pollutant less than ten tons per year. However, that rule revision has not yet been approved by U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). Therefore, until the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-31-05, the requirement to satisfy BAT still exists as part of the federally-approved SIP for Ohio. Once U.S. EPA approves the December 1, 2006 version of 3745-31-05, then these emission limits/control measures no longer apply.
  - c. These rule paragraphs apply once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 as part of the State Implementation Plan.
    - i. This PTIO takes into account the following voluntary restrictions (including the use of any applicable air pollution control equipment) as proposed by the permittee for the purposes of avoiding BAT requirements under OAC rule 3745-31-05(A)(3) for VOC emissions.
      - (a) Use of enclosed flare or equivalent control device, unless the uncontrolled potential to emit is  $\leq 9.9$  tons/year.
  - d. This emission unit is exempt from the control requirements of 40 CFR Part 60.110(b) because the tank size is less than 75 m<sup>3</sup>.
  - e. The permittee shall not place, store, or hold in this fixed roof tank any petroleum liquid other than crude oil and condensate where there is no custody transfer, unless such tank is designed or equipped in accordance with the requirements of paragraph (L)(1) of OAC rule 3745-21-09 with an internal floating roof or equivalent control approved by the Director, prior to storing such petroleum liquids.
- c) Operational Restrictions
- (1) When so equipped, the flare shall be operated at all times when emissions are being vented to it.
  - (2) The flare shall be operated with a pilot flame present at all times.
- d) Monitoring and/or Recordkeeping Requirements
- (1) The permittee shall record the annual throughput, in gallons per year. These records shall be maintained for at least 5 years and shall be made available to the Director or his representative upon verbal or written request.
- e) Reporting Requirements

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- (1) Annual Permit Evaluation Report (PER) forms will be mailed to the permittee at the end of the reporting period specified in the Authorization section of this permit. The permittee shall submit the PER in the form and manner provided by the director by the due date identified in the Authorization section of this permit. The permit evaluation report shall cover a reporting period of no more than twelve-months for each air contaminant source identified in this permit.
- f) Testing Requirements
- (1) Emission limitation:  
VOC emissions shall not exceed 3.3 tons/year  
  
Applicable Compliance Method:  
  
This emissions limitation was established using a current version of the U.S. EPA's TANKS software program.
- g) Miscellaneous Requirements
- (1) None.

**6. Emissions Unit: Combustion Device/Flare, P002**

**Operations, Property and/or Equipment Description:**

P002	Excess Gas Combustion Device/Flare (enclosed smokeless).
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- a) This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).
- (1) For the purpose of a permit-to-install document, the emissions unit terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.
- (a) None.
- (2) For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.
- (a) None.
- b) Applicable Emissions Limitations and/or Control Requirements
- (1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	40 CFR 60.18(c)(1) 40 CFR 63.11(b)(4)	There shall be no visible emissions except for 5 minutes during any 2 consecutive hours.
b.	ORC 3704.03(T)	Carbon monoxide (CO) emissions shall not exceed 3.40 lbs/hr and 14.91 tons/year.
c.	OAC rule 3745-31-05(A)(3), as effective 11/30/01	<p>Nitrogen oxide (NO<sub>x</sub>) emissions shall not exceed 0.63 lb/hr and 2.74 tons/year.</p> <p>Sulfur dioxide (SO<sub>2</sub>) emissions shall not exceed 0.006 lb/hr and 0.024 ton/year.</p> <p>Volatile organic compound (VOC) emissions shall not exceed 0.06 lb/hr and 0.28 ton/year.</p> <p>The flare shall provide a destruction efficiency of 99.8% for the VOCs routed to it.</p>

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		See b)(2)a.
d.	OAC rule 3745-31-05(A)(3)(a)(ii), as effective 12/01/06	See b)(2)b.

(2) Additional Terms and Conditions

- a. The permittee has satisfied the Best Available Technology (BAT) requirements pursuant to OAC rule 3745-31-05(A)(3), as effective November 30, 2001, in this permit. On December 1, 2006, paragraph (A)(3) of OAC rule 3745-31-05 was revised to conform to the Ohio Revised Code (ORC) changes effective August 3, 2006 (Senate Bill 265 changes), such that BAT is no longer required by State regulations for National Ambient Air Quality Standard (NAAQS) pollutant(s) less than ten tons per year. However, that rule revision has not yet been approved by U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). Therefore, until the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-31-05, the requirement to satisfy BAT still exists as part of the federally-approved SIP for Ohio. Once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 these emission limitations/control measures no longer apply.

- b. These rule paragraphs apply once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 as part of the State Implementation Plan.

- i. This PTIO takes into account the following voluntary restrictions (including the use of any applicable air pollution control equipment) as proposed by the permittee for the purposes of avoiding BAT requirements under OAC rule 3745-31-05(A)(3) for VOC emissions.

Destruction efficiency of 99.8% efficiency for VOC.

- ii. The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the NO<sub>x</sub>, SO<sub>2</sub>, and particulate from this air contaminant source since the uncontrolled potential to emit for NO<sub>x</sub>, SO<sub>2</sub>, and particulate are less than ten tons per year.
- c. The permittee shall properly install, operate, and maintain a device to continuously monitor the pilot flame when the emissions unit is in operation. The monitoring device and any recorder shall be installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and operating manuals.

[40 CFR 60.18], [40 CFR 63.11], and/or [OAC rule 3745-21-10(P)]

c) Operational Restrictions

- (1) A pilot flame shall be maintained at all times in the flare's pilot light burner. The presence of the pilot flame shall be monitored using a thermocouple or other equivalent device to detect the presence of a flame.

[40 CFR 60.18(c)(2) and (f)(2)] or [40 CFR 63.11(b)(5)]



- (2) All collected gas shall be vented to a flare designed and operated as follows:
- The flare shall be designed for and operated with no visible emissions, as determined by Method 22 of Appendix A of 40 CFR Part 60, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.
  - The flare shall be operated with a flame present at all times when gases are vented to it. The presence of a flare pilot flame shall be monitored using a thermocouple or any other equivalent device to detect the presence of a flame. The net heating value of the gas being combusted and the actual exit velocity shall be calculated as required in the Testing Section of this permit.
  - The net heating value ( $H_T$ ) of the gas being combusted and actual exit velocity of the flare shall be calculated as required in the Testing Section of this permit.

[40 CFR 60.18(c) through (f)], [40 CFR 63.11(b)], and/or [OAC rule 3745-21-10(P)]

- (3) Flares shall be steam-assisted, air-assisted, or non-assisted, and shall comply with the following requirements for the heat content in paragraph "a" **and** the maximum tip velocity in paragraph "b", **or** shall comply with the alternative requirements in paragraph "c" for nonassisted flares:

- Steam-assisted or air-assisted flares shall have a net heating value of 300 Btu/scf (11.2 MJ/scm) or greater, for the gas being combusted.

Nonassisted flares shall have a net heating value of 200 Btu/scf (7.45 MJ/scm) for the gas being combusted.

- Steam-assisted and/or nonassisted flares shall be designed for and operated with an exit velocity of less than 18.3 m/sec (60 ft/sec), with the following exceptions:

- steam-assisted and nonassisted flares, having a net heating value of 1,000 Btu/scf (37.3 MJ/scm) for the gas being combusted, can be designed for and operated with an exit velocity equal to or greater than 18.3 m/sec (60 ft/sec), but less than 122 m/sec (400 ft/sec); and

steam-assisted and nonassisted flares can be designed for and operated with an exit velocity of less than the velocity calculated below for  $V_{max}$ , and less than 122 m/sec (400 ft/sec):

$$\text{Log}_{10}(V_{max}) = (H_T + 28.8)/31.7$$

where:

$V_{max}$  = maximum permitted velocity, m/sec;

28.8 = constant;

31.7 = constant; and

$H_T$  = the net heating value as determined in the Testing Section of this permit.

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- ii. Air-assisted flares shall be designed and operated with an exit velocity less than the velocity  $V_{\max}$ , calculated as follows:

$$V_{\max} = 8.706 + 0.7084 (H_T)$$

where:

$V_{\max}$  = maximum permitted velocity, m/sec;

8.706 = constant;

0.7084 = constant; and

$H_T$  = the net heating value as determined in the Testing Section of this permit.

OR

- c. Nonassisted flares that have a diameter of 3 inches or greater and a hydrogen content of 8.0 percent (by volume), or greater, shall be designed for and operated with an exit velocity of less than 37.2 m/sec (122 ft/sec) and less than the velocity,  $V_{\max}$ , as determined by the following equation:

$$V_{\max} = (X_{H_2} - K_1) K_2$$

where:

$V_{\max}$  = maximum permitted velocity, m/sec;

$K_1$  = constant, 6.0 volume-percent hydrogen;

$K_2$  = constant, 3.9 (m/sec)/volume-percent hydrogen; and

$X_{H_2}$  = the volume-percent of hydrogen, on a wet basis, as calculated by using the ASTM Method D1946-90.

[40 CFR 60.18(c) through (f)], [40 CFR 63.11(b)], and/or [OAC rule 3745-21-10(P)]

- d) Monitoring and/or Recordkeeping Requirements

- (1) The permittee shall monitor the flare to ensure that it is operated and maintained in conformance with its design and the requirements contained in this permit. The net heating value of a gas, the actual exit velocity for the flare, and the maximum permitted velocity for an air-assisted flare shall be determined as required by 40 CFR 60.18, 40 CFR 63.11, and/or OAC rule 3745-10(P), as applicable.

[40 CFR 60.18], [40 CFR 63.11], and/or [OAC rule 3745-21-10(P)]

- (2) The permittee shall record the following information each day for the flare and process operations:

- a. all periods during which there was no pilot flame; and

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- b. the operating times for the flare, monitoring equipment, and the associated emissions unit.

[40 CFR 60.13] and/or [40 CFR 63.8]

e) Reporting Requirements

- (1) Annual Permit Evaluation Report (PER) forms will be mailed to the permittee at the end of the reporting period specified in the Authorization section of this permit. The permittee shall submit the PER in the form and manner provided by the director by the due date identified in the Authorization section of this permit. The permit evaluation report shall cover a reporting period of no more than twelve-months for each air contaminant source identified in this permit. The permittee shall identify in the annual permit evaluation report all periods of time during which the pilot flame was not functioning properly or the flare was not maintained as required in this permit. The reports shall include the date, time, and duration of each such period.

[OAC 3745-15-03(B)(2) and (D)] and [40 CFR 60.19] and/or [40 CFR 63.10]

f) Testing Requirements

- (1) Net Heating Value:

9.2 MMBtu/hr

Applicable Calculation Method:

The net heating value of the gas being combusted at the flare shall be calculated as follows:

$$H_T = k \sum_{i=1}^n C_i H_i$$

where:

$H_T$  = net heating value of the sample, MJ/scm; where the net enthalpy per mole of off gas is based on combustion at 25 degrees Celsius and 760 mm Hg, but the standard temperature of 20 degrees Celsius is used for determining the volume corresponding to one mole;

$k$  = constant,  $1.740 \times 10^{-7}$  (1/ppm) (g mole/scm) (MJ/kcal), where the standard temperature for "g mole/scm" is 20 degrees Celsius;

$C_i$  = concentration of sample component "i" in ppm on a wet basis, as measured for organics by Reference Method 18 and measured for hydrogen and carbon monoxide by ASTM D1946-90;

$H_i$  = net heat of combustion of sample component "i", kcal/g mole at 25 degrees Celsius and 760 mm Hg. The heat of combustion may be determined using ASTM D4809-95 if published values are not available or cannot be calculated;

$i$  = subscript denoting a specific component in the sample; and

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$n$  = total number of components within the sample.

The conversion factor of "26.84 Btu scm/MJ scf" can be used to convert the net heating value of the gas ( $H_T$ ) from MJ/scm to Btu/scf.

[40 CFR 60.18], [40 CFR 63.11], and/or [OAC rule 3745-21-10(P)(2)]

- (2) The actual exit velocity of the flare shall be determined by dividing the volumetric flow rate (in units of standard temperature and pressure) of the flare header or headers that feed the flare, as determined by Reference Methods 2, 2A, 2C, or 2D (found in 40 CFR 60, Appendix A), as appropriate, by the unobstructed (free) cross-sectional area of the flare tip.

The conversion factor of "3.281 ft/m" can be used to convert the velocity from m/sec to ft/sec.

[40 CFR 60.18], [40 CFR 63.11], and/or [OAC rule 3745-21-10(P)(3)]

- (3) Emission Limitations:

0.006 lb  $SO_2$ /hr

0.024 tons of  $SO_2$ /year

Applicable Compliance Method:

The emissions limit for  $SO_2$  is based on using the AP-42 emission factor of 0.000588 lb  $SO_2$ /MMBtu from Chapter 3.2 for Natural Gas-fired Reciprocating Engines, Table 3.2-3, "Uncontrolled Emission Factors for 4-Stroke Rich-Burn Engines" and using the estimated burner rating of 9.2 MMBtu/hr. Estimated  $SO_2$  emissions shall be determined by the following calculation:

$$0.000588 \text{ lb } SO_2/\text{MMBtu} \times 9.2 \text{ MMBtu/hr} = 0.00552 \text{ lb } SO_2/\text{hr}$$

$$0.00552 \text{ lb } SO_2/\text{hr} \times 8760 \text{ hrs/yr} \times 1 \text{ ton}/2000 \text{ lbs} = 0.024 \text{ ton } SO_2/\text{year}$$

- (4) Emission Limitations:

0.626 lb  $NO_x$ /hr

2.74 tons of  $NO_x$ /year

Applicable Compliance Method:

The emissions limit for  $NO_x$  is based on using the AP-42 emission factor of 0.068 lb  $NO_x$ /MMBtu from Chapter 13.5 for Industrial Flares, Table 13.5-1, "Emission Factors for Flare Operations" and using the estimated burner rating of 9.2 MMBtu/hr. Estimated  $NO_x$  emissions shall be determined by the following calculation:

$$0.068 \text{ lb } NO_x/\text{MMBtu} \times 9.2 \text{ MMBtu/hr} = 0.6256 \text{ lb } NO_x/\text{hr}$$

$$0.6256 \text{ lb } NO_x/\text{hr} \times 8760 \text{ hrs/yr} \times 1 \text{ ton}/2000 \text{ lbs} = 2.74 \text{ ton } NO_x/\text{year}$$

- (5) Emission Limitations:

3.40 lbs CO/hr

14.91 tons of CO/year

Applicable Compliance Method:

The emissions limit for CO is based on using the AP-42 emission factor of 0.37 lb CO/MMBtu from Chapter 13.5 for Industrial Flares, Table 13.5-1, "Emission Factors for Flare Operations" and using the estimated burner rating of 9.2 MMBtu/hr. Estimated CO emissions shall be determined by the following calculation:

$$0.37 \text{ lb CO/MMBtu} \times 9.2 \text{ MMBtu/hr} = 3.404 \text{ lbs CO /hr}$$

$$3.404 \text{ lbs CO/hr} \times 8760 \text{ hrs/yr} \times 1 \text{ ton/2000 lbs} = 14.91 \text{ ton CO/year}$$

(6) Emission Limitations:

0.06 lb VOC/hr

0.28 ton of VOC/year

Applicable Compliance Method:

The emissions limits are based on the potential VOC emissions routed to the enclosed flare and a destruction efficiency of 99.8%.

$$32.10 \text{ lbs VOC/hr} \times (100\% - 99.8\% \text{ control}) = 0.064 \text{ lb VOC/hr}$$

$$0.064 \text{ lb VOC/hr} \times 8760 \text{ hrs/yr} \times 1 \text{ ton/2000 lbs} = 0.28 \text{ ton VOC/year}$$

(7) Emission Limitation

There shall be no visible emissions from the flare, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

Applicable Compliance Method

Compliance with the visible emissions limitation shall be determined in accordance with U.S. EPA Method 22 in Appendix A of 40 CFR Part 60.

[40 CFR 60.18(c)(1)] or [40 CFR 63.11(b)(4)]

g) Miscellaneous Requirements

- (1) None.



Environmental  
Protection Agency

## Application for Permit to Install (PTI) and Permit to Install/Operate (PTIO)

For EPA Use Only

Application Number \_\_\_\_\_

Date Received \_\_\_\_\_

Ohio Environmental Protection Agency  
Lazarus Government Center  
50 West Town Street, Suite 700  
P.O. Box 1049  
Columbus, Ohio 43216-1049

### Facility Information

Note: Application is incomplete if all **bolded** questions throughout the application are not completed.

**Legal Facility Name** \_\_\_\_\_

**Alternate Name** (if any) \_\_\_\_\_

**Facility Physical Address** \_\_\_\_\_

**City, ZIP code** \_\_\_\_\_

**County** \_\_\_\_\_

**Facility ID** \_\_\_\_\_

**Facility Description** \_\_\_\_\_

**NAICS Code** \_\_\_\_\_

**Facility Latitude**

degrees

minutes

seconds

**Facility Longitude**

degrees

minutes

seconds

**Core Place ID** (if known) \_\_\_\_\_

**SCSC ID** (if known) \_\_\_\_\_

**Portable?**

☐ Yes ☐ No

**Portable Type**

☐ Asphalt Plant ☐ Concrete Plant ☐ Generator ☐ Aggregate Processing ☐ Concrete Crusher ☐ Grinder ☐ Other

**Initial Location County**

If "Other", describe: \_\_\_\_\_

## Contact Information

☐ No change to information on file.

<b>1</b>	<input type="checkbox"/> Billing	<input type="checkbox"/> Owner	<input type="checkbox"/> Primary	<input type="checkbox"/> Operator	<input type="checkbox"/> On-Site	<input type="checkbox"/> Responsible Official

<b>2</b>	<input type="checkbox"/> Billing	<input type="checkbox"/> Owner	<input type="checkbox"/> Primary	<input type="checkbox"/> Operator	<input type="checkbox"/> On-Site	<input type="checkbox"/> Responsible Official

<b>3</b>	<input type="checkbox"/> Billing	<input type="checkbox"/> Owner	<input type="checkbox"/> Primary	<input type="checkbox"/> Operator	<input type="checkbox"/> On-Site	<input type="checkbox"/> Responsible Official

<b>4</b>	<input type="checkbox"/> Billing	<input type="checkbox"/> Owner	<input type="checkbox"/> Primary	<input type="checkbox"/> Operator	<input type="checkbox"/> On-Site	<input type="checkbox"/> Responsible Official

<b>5</b>	<input type="checkbox"/> Billing	<input type="checkbox"/> Owner	<input type="checkbox"/> Primary	<input type="checkbox"/> Operator	<input type="checkbox"/> On-Site	<input type="checkbox"/> Responsible Official

<b>6</b>	<input type="checkbox"/> Billing	<input type="checkbox"/> Owner	<input type="checkbox"/> Primary	<input type="checkbox"/> Operator	<input type="checkbox"/> On-Site	<input type="checkbox"/> Responsible Official



**Division of Air Pollution Control**  
**Application for Permit-to-Install or Permit-to-Install and Operate**

**Section I – General Application Information**

*This section should be filled out for each permit to install (PTI) or Permit to Install and Operate (PTIO) application. A PTI is required for all air contaminant sources (emissions units) installed or modified after January 1, 1974 that are subject to OAC Chapter 3745-77. A PTIO is required for all air contaminant sources (emissions units) that are not subject to OAC Chapter 3745-77 (Title V). See the application instructions for additional information.*

For OEPA use only:

- ☐ Installation  
☐ Modification  
☐ Renewal

- ☐ Request Federally enforceable restrictions  
☐ General Permit  
☐ Other

1. Is the purpose of this application to transition from OAC Chapter 3745-77 (Title V) to OAC Chapter 3745-31 (PTIO)?

☐ yes      ☐ no

2. **Establish PER Due Date** - Select an annual Permit Evaluation Report (PER) due date for this facility (does not apply to facilities subject to Title V, OAC Chapter 3745-77). If the PER has previously been established and a change is now desired, a PER Change Request form must be filed instead of selecting a date here.

Due Date:

- ☐ February 15  
☐ May 15  
☐ August 15  
☐ November 15

For Time Period:

- January 1 through December 31  
April 1 through March 31  
July 1 through June 30  
October 1 through September 30

- ☐ PER not applicable (Title V) or due date already established  
☐ PER Request Permit Change form attached

3. **Federal Rules Applicability** - Please check all of the appropriate boxes below.

**New Source Performance Standards (NSPS)**

*New Source Performance Standards are listed under 40 CFR 60 - Standards of Performance for New Stationary Sources.*

- ☐ not affected    ☐ subject to Subpart: \_\_\_\_\_  
☐ unknown        ☐ exempt - explain below

**National Emission Standards for Hazardous Air Pollutants (NESHAP)**

*National Emissions Standards for Hazardous Air Pollutants are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).*

- ☐ not affected    ☐ subject to Subpart: \_\_\_\_\_  
☐ unknown        ☐ subject, but exempt - explain below

**Maximum Achievable Control Technology (MACT)**

*The Maximum Achievable Control Technology standards are listed under 40 CFR 63 and OAC rule 3745-31-28.*

- ☐ not affected    ☐ subject to Subpart: \_\_\_\_\_  
☐ unknown        ☐ subject, but exempt - explain below

**Prevention of Significant Deterioration (PSD)**

*These rules are found under OAC rule 3745-31-10 through OAC rule 3745-31-20.*

- ☐ not affected    ☐ subject to regulation  
☐ unknown

**Non-Attainment New Source Review**

*These rules are found under OAC rule 3745-31-21 through OAC rule 3745-31-27.*

- ☐ not affected    ☐ subject to regulation  
☐ unknown

**112 (r) - Risk Management Plan**

- ☐ not affected    ☐ subject to regulation



These rules are found under 40 CFR 68.

☐ unknown

**Title IV (Acid Rain Requirements)**

These rules are found under 40 CFR 72 and 40 CFR 73.

☐ not affected ☐ subject to regulation  
☐ unknown

Please explain why you checked "exempt" in this question for one or more federal rules. Identify each exemption and whether the entire facility and/or the specific air contaminant sources included in this permit application is exempted. Attach an additional page if necessary.

4. Express PTI/PTIO - Do you qualify for express PTI or PTIO processing?

☐ yes ☐ no

If yes, are you requesting express processing per OAC rule 3745-31-05?

☐ yes ☐ no

5. **Air Contaminant Sources in this Application** - Identify the air contaminant source(s) for which you are applying below. Attach additional pages if necessary. Section II of this application and an EAC form should be completed for each air contaminant source.

Emissions Unit ID*	Company Equipment ID (company's name for air contaminant source)	Equipment Description (List all equipment that are a part of this air contaminant source)

\* This ID would have been created when a previous air permit was issued. If no previous permits have been issued for this air contaminant source, leave this field blank. If this air contaminant source was previously identified in STARShip applications as a "Z" source (e.g., Z001), please provide that identification and a new ID will be assigned when the PTI/PTIO is issued.

6. Trade Secret Information - Is any information included in this application being claimed as a trade secret per Ohio Revised Code (ORC) 3704.08?

☐ yes (A "non-confidential" version must also be submitted in order for this application to be deemed complete.)  
☐ no

7. Permit Application Contact - Person to contact for questions about this application:

Name

Title

---

Address (Street, City/Township, State and Zip Code)

---

Phone

Fax

E-mail

8. **Authorized Signature** – OAC rule 3745-31-04 states that applications for permits to install or permits to install and operate shall be signed:
- (1) In the case of a corporation, by a principal executive officer of at least the level of vice president, or his duly authorized representative, if such representative is responsible for the overall operation of the facility.
  - (2) In the case of a partnership by a general partner.
  - (3) In the case of sole proprietorship, by the proprietor, and
  - (4) In the case of a municipal, state, federal or other governmental facility, by the principal executive officer, the ranking elected official, or other duly authorized employee.

Under OAC rule 3745-31-04, this signature shall constitute personal affirmation that all statements or assertions of fact made in the application are true and complete, comply fully with applicable state requirements, and shall subject the signatory to liability under applicable state laws forbidding false or misleading statements.

---

Authorized Signature (for facility)

Date

---

Print Name

Title

One copy of this section should be filled out for each air contaminant source (emissions unit) covered by this PTI/PTIO application identified in Section I, Question 5. See the application instructions for additional information.

1. **Air Contaminant Source Installation or Modification Schedule** – Check all that apply (must be completed regardless of date of installation or modification):

- ☐ New installation (for which construction has not yet begun, in accordance with OAC rule 3745-31-33). When will you begin to install the air contaminant source?

(month/year) \_\_\_\_\_ **OR** ☐ after installation permit has been issued

- ☐ Initial application for an air contaminant source already installed or under construction. Identify installation date or the date construction began (month/year) \_\_\_\_\_ and the date operation began (month/year) \_\_\_\_\_

- ☐ Modification to an existing air contaminant source/facility (for which modification has not yet begun) - List previous PTI or PTIO number(s) for air contaminant sources included in this application, if applicable, and describe the requested modification (attach an additional sheet, if necessary):

\_\_\_\_\_  
When will you begin to modify the air contaminant source? (month/year) \_\_\_\_\_ **OR** ☐ after modification permit has been issued

- ☐ Modification application for an air contaminant source which has been or is currently being modified. List previous PTI or PTIO number(s) for air contaminant sources included in this application, if applicable, and describe the requested modification (attach an additional sheet, if necessary):

\_\_\_\_\_  
Identify modification date or the date modification began (month/year) \_\_\_\_\_ and the date operation began (month/year) \_\_\_\_\_

- ☐ Reconstruction of an existing air contaminant source/facility. Please explain: \_\_\_\_\_  
\_\_\_\_\_

- ☐ Renewal of an existing permit-to-operate (PTO) or PTIO

Identify the date operation began after installation or latest modification (month/year) \_\_\_\_\_

- ☐ General Permit    General Permit Category \_\_\_\_\_    General Permit Type \_\_\_\_\_

Complete, sign and attach the appropriate Qualifying Criteria Document

- ☐ Other, please explain: \_\_\_\_\_

2. **SCC Codes** - List all Source Classification Code(s) (SCC) that describe the process(es) performed by this air contaminant source (e.g., 1-02-002-04).

3. **Emissions Information** - The following table requests information needed to determine the applicable requirements and the compliance status of this air contaminant source with those requirements. Suggestions for how to estimate emissions may be found in the instructions to the Emissions Activity Category (EAC) forms required with this application. If you need further assistance, contact your District Office/Local Air Agency representative.
- If total potential emissions of HAPs or any Toxic Air Contaminant (as identified in OAC rule 3745-114-01) are greater than 1 ton/yr, fill in the table for that (those) pollutant(s). For all other pollutants, if "Emissions before controls (max), lb/hr" multiplied by 24 hours/day is greater than 10 lbs/day, fill in the table for that pollutant.
  - Actual emissions are calculated including add-on control equipment. If you have no add-on control equipment, "Emissions before controls" will be the same as "Actual emissions".
  - Actual emissions and Requested Allowable should be based on operating 8760 hr/yr unless you are requesting federally enforceable operating restrictions to limit emissions. If so, calculate emissions based on requested operating restrictions and describe in your calculations.
  - If you use units other than lbs/hr or ton/yr, specify the units used (e.g., gr/dscf, lb/ton charged, lb/MMBtu, tons/12-months).
  - Requested Allowable (ton/yr) is often equivalent to Potential to Emit (PTE) as defined in OAC rule 3745-31-01 and OAC rule 3745-77-01.

Pollutant	Emissions before controls (max)* (lb/hr)	Actual emissions* (lb/hr)	Actual emissions* (ton/year)	Requested Allowable* (lb/hr)	Requested Allowable* (ton/year)
Particulate emissions (PE/PM) (formerly particulate matter, PM)					
PM $\leq$ 10 microns in diameter (PE/PM <sub>10</sub> )					
PM $\leq$ 2.5 microns in diameter (PE/PM <sub>2.5</sub> )					
Sulfur dioxide (SO <sub>2</sub> )					
Nitrogen oxides (NO <sub>x</sub> )					
Carbon monoxide (CO)					
Organic compounds (OC)					
Volatile organic compounds (VOC)					
Lead (Pb)					
Total Hazardous Air Pollutants (HAPs)					
Highest single HAP:					
Toxic Air Contaminants (see instructions):					

\* Provide your calculations as an attachment and explain how all process variables and emission factors were selected. Note the emission factor(s) employed and document origin. Example: AP-42, Table 4.4-3 (8/97); stack test, Method 5, 4/96; mass balance based on MSDS; etc.

4. **Best Available Technology (BAT)** - For each pollutant for which the Requested Allowable in the above table exceeds 10 tons per year, BAT, as defined in OAC 3745-31-01, is required. Describe what has been selected as BAT and the basis for the selection:

5. **Control Equipment** - Does this air contaminant source employ emissions control equipment?

- ☐ Yes - fill out the applicable information below.  
☐ No - proceed to Question 6.

Select the type(s) of control equipment employed below (required data for selected control equipment in **bold**):

Pollutant abbreviations

PE/PM = Particulate emissions (formerly particulate matter)

PE/PM<sub>2.5</sub> = PM ≤ 2.5 microns in diameter

VOC = Volatile organic compounds

NO<sub>x</sub> = Nitrogen oxides

PE/PM<sub>10</sub> = PM ≤ 10 microns in diameter

OC = Organic compounds

SO<sub>2</sub> = Sulfur dioxide

CO = Carbon monoxide

Pb = Lead

- ☐ Adsorber

Manufacturer: \_\_\_\_\_ Year installed: \_\_\_\_\_ Your ID for control equipment \_\_\_\_\_

Describe this control equipment: \_\_\_\_\_

**Pollutant(s) controlled:** ☐ PE/PM ☐ PE/PM<sub>10</sub> ☐ PE/PM<sub>2.5</sub> ☐ OC ☐ VOC  
☐ SO<sub>2</sub> ☐ NO<sub>x</sub> ☐ CO ☐ Pb ☐ Other \_\_\_\_\_

**Estimated capture efficiency (%)**: \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

**Design control efficiency (%)**: \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

**Operating control efficiency (%)**: \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

**Type:** ☐ Fluidized Bed ☐ Fixed Bed ☐ Moving Bed ☐ Disposable ☐ Concentrator ☐ Other \_\_\_\_\_

**Adsorption Media:** \_\_\_\_\_

**For Fluidized Bed, Fixed Bed, Moving Bed and Disposable only:**

**Maximum design outlet organic compound concentration (ppmv):** \_\_\_\_\_

**Media replacement frequency or regeneration cycle time (specify units):** \_\_\_\_\_

**Maximum temperature of the media bed, after regeneration (including any cooling cycle):** \_\_\_\_\_

**For Concentrator Only:**

**Design regeneration cycle time (minutes):** \_\_\_\_\_

**Minimum desorption air stream temperature (°F):** \_\_\_\_\_

**Rotational rate (revolutions/hour):** \_\_\_\_\_

**Inlet gas flow rate (acfm):** \_\_\_\_\_ **Outlet gas flow rate (acfm):** \_\_\_\_\_

**Inlet gas temperature (°F):** \_\_\_\_\_ **Outlet gas temperature (°F):** \_\_\_\_\_

☐ **This is the only control equipment on this air contaminant source**

**If not, this control equipment is:** ☐ Primary ☐ Secondary ☐ Parallel

**List all other air contaminant sources that are also vented to this control equipment:** \_\_\_\_\_

**List all egress point IDs (from Table 7-A) associated with this control equipment:** \_\_\_\_\_

- ☐ Catalytic Converter

Manufacturer: \_\_\_\_\_ Year installed: \_\_\_\_\_ Your ID for control equipment \_\_\_\_\_

Describe this control equipment: \_\_\_\_\_

**Pollutant(s) controlled:** ☐ PE/PM ☐ PE/PM<sub>10</sub> ☐ PE/PM<sub>2.5</sub> ☐ OC ☐ VOC  
☐ SO<sub>2</sub> ☐ NO<sub>x</sub> ☐ CO ☐ Pb ☐ Other \_\_\_\_\_

**Estimated capture efficiency (%)**: \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

**Design control efficiency (%)**: \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

**Operating control efficiency (%)**: \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

☐ **This is the only control equipment on this air contaminant source**

**If not, this control equipment is:** ☐ Primary ☐ Secondary ☐ Parallel

**List all other air contaminant sources that are also vented to this control equipment:** \_\_\_\_\_

**List all egress point IDs (from Table 7-A) associated with this control equipment:** \_\_\_\_\_

- ☐ Catalytic Incinerator

Manufacturer: \_\_\_\_\_ Year installed: \_\_\_\_\_ Your ID for control equipment \_\_\_\_\_

Describe this control equipment: \_\_\_\_\_

**Pollutant(s) controlled:** ☐ PE/PM ☐ PE/PM<sub>10</sub> ☐ PE/PM<sub>2.5</sub> ☐ OC ☐ VOC  
☐ SO<sub>2</sub> ☐ NO<sub>x</sub> ☐ CO ☐ Pb ☐ Other \_\_\_\_\_

**Estimated capture efficiency (%)**: \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

Describe this control equipment: \_\_\_\_\_ Design control efficiency (%): \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

Operating control efficiency (%): \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

Combustion chamber residence time (seconds): \_\_\_\_\_

Minimum temperature difference (°F) across catalyst during air contaminant source operation: \_\_\_\_\_

Inlet gas flow rate (acfm): \_\_\_\_\_ Outlet gas flow rate (acfm): \_\_\_\_\_

Minimum inlet gas temperature (°F): \_\_\_\_\_ Outlet gas temperature (°F): \_\_\_\_\_

☐ This is the only control equipment on this air contaminant source

If not, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel

List all other air contaminant sources that are also vented to this control equipment: \_\_\_\_\_

List all egress point IDs (from Table 7-A) associated with this control equipment: \_\_\_\_\_

☐ Condenser

Manufacturer: \_\_\_\_\_ Year installed: \_\_\_\_\_ Your ID for control equipment \_\_\_\_\_

Pollutant(s) controlled: ☐ PE/PM ☐ PE/PM<sub>10</sub> ☐ PE/PM<sub>2.5</sub> ☐ OC ☐ VOC  
☐ SO<sub>2</sub> ☐ NO<sub>x</sub> ☐ CO ☐ Pb ☐ Other \_\_\_\_\_

Estimated capture efficiency (%): \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

Design control efficiency (%): \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

Operating control efficiency (%): \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

Type: ☐ Indirect contact ☐ Direct contact ☐ Freeboard refrigeration device ☐ Other: \_\_\_\_\_

Maximum exhaust gas temperature (°F) during air contaminant source operation: \_\_\_\_\_

Coolant type: \_\_\_\_\_

Design coolant temperature (°F): Minimum \_\_\_\_\_ Maximum \_\_\_\_\_

Design coolant flow rate (gpm): \_\_\_\_\_

Inlet gas flow rate (acfm): \_\_\_\_\_ Outlet gas flow rate (acfm): \_\_\_\_\_

Inlet gas temperature (°F): \_\_\_\_\_

☐ This is the only control equipment on this air contaminant source

If not, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel

List all other air contaminant sources that are also vented to this control equipment: \_\_\_\_\_

List all egress point IDs (from Table 7-A) associated with this control equipment: \_\_\_\_\_

☐ Cyclone/Multiclone

Manufacturer: \_\_\_\_\_ Year installed: \_\_\_\_\_ Your ID for control equipment \_\_\_\_\_

Describe this control equipment: \_\_\_\_\_

Pollutant(s) controlled: ☐ PE/PM ☐ PE/PM<sub>10</sub> ☐ PE/PM<sub>2.5</sub> ☐ OC ☐ VOC  
☐ SO<sub>2</sub> ☐ NO<sub>x</sub> ☐ CO ☐ Pb ☐ Other \_\_\_\_\_

Estimated capture efficiency (%): \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

Design control efficiency (%): \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

Operating control efficiency (%): \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

Type: ☐ Simple ☐ Multiclone ☐ Rotoclone ☐ Other \_\_\_\_\_

Operating pressure drop range (inches of water): Minimum: \_\_\_\_\_ Maximum: \_\_\_\_\_

Inlet gas flow rate (acfm): \_\_\_\_\_ Outlet gas flow rate (acfm): \_\_\_\_\_

☐ This is the only control equipment on this air contaminant source

If not, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel

List all other air contaminant sources that are also vented to this control equipment: \_\_\_\_\_

List all egress point IDs (from Table 7-A) associated with this control equipment: \_\_\_\_\_

☐ Dry Scrubber

Manufacturer: \_\_\_\_\_ Year installed: \_\_\_\_\_ Your ID for control equipment \_\_\_\_\_

Describe this control equipment: \_\_\_\_\_

Pollutant(s) controlled: ☐ PE/PM ☐ PE/PM<sub>10</sub> ☐ PE/PM<sub>2.5</sub> ☐ OC ☐ VOC  
☐ SO<sub>2</sub> ☐ NO<sub>x</sub> ☐ CO ☐ Pb ☐ Other \_\_\_\_\_

Estimated capture efficiency (%): \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

Design control efficiency (%): \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

Operating control efficiency (%): \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

Reagent(s) used: Type: \_\_\_\_\_ Injection rate(s): \_\_\_\_\_

Inlet gas flow rate (acfm): \_\_\_\_\_ Outlet gas flow rate (acfm) : \_\_\_\_\_

Inlet gas temperature (°F): \_\_\_\_\_ Outlet gas temperature (°F): \_\_\_\_\_

☐ This is the only control equipment on this air contaminant source

If not, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel

List all other air contaminant sources that are also vented to this control equipment: \_\_\_\_\_

List all egress point IDs (from Table 7-A) associated with this control equipment: \_\_\_\_\_

☐ Electrostatic Precipitator

Manufacturer: \_\_\_\_\_ Year installed: \_\_\_\_\_ Your ID for control equipment \_\_\_\_\_

Describe this control equipment:

Pollutant(s) controlled: ☐ PE/PM ☐ PE/PM<sub>10</sub> ☐ PE/PM<sub>2.5</sub> ☐ OC ☐ VOC  
☐ SO<sub>2</sub> ☐ NO<sub>x</sub> ☐ CO ☐ Pb ☐ Other \_\_\_\_\_

Estimated capture efficiency (%): \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

Design control efficiency (%): \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

Operating control efficiency (%): \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

Type: ☐ Dry ☐ Wet ☐ Other: \_\_\_\_\_

Number of operating fields: \_\_\_\_\_

Secondary voltage (V) range (minimum – maximum): \_\_\_\_\_

Secondary current (milliamps) range (minimum – maximum): \_\_\_\_\_

Inlet gas flow rate (acfm): \_\_\_\_\_ Outlet gas flow rate (acfm) : \_\_\_\_\_

☐ This is the only control equipment on this air contaminant source

If not, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel

List all other air contaminant sources that are also vented to this control equipment: \_\_\_\_\_

List all egress point IDs (from Table 7-A) associated with this control equipment: \_\_\_\_\_

☐ Fabric Filter/Baghouse

Manufacturer: \_\_\_\_\_ Year installed: \_\_\_\_\_ Your ID for control equipment \_\_\_\_\_

Describe this control equipment:

Pollutant(s) controlled: ☐ PE/PM ☐ PE/PM<sub>10</sub> ☐ PE/PM<sub>2.5</sub> ☐ OC ☐ VOC  
☐ SO<sub>2</sub> ☐ NO<sub>x</sub> ☐ CO ☐ Pb ☐ Other \_\_\_\_\_

Estimated capture efficiency (%): \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

Design control efficiency (%): \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

Operating control efficiency (%): \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

Operating pressure drop range (inches of water): Minimum: \_\_\_\_\_ Maximum: \_\_\_\_\_

Pressure type: ☐ Negative pressure ☐ Positive pressure

Fabric cleaning mechanism: ☐ Reverse air ☐ Pulse jet ☐ Shaker ☐ Other \_\_\_\_\_

Bag leak detection system: ☐ Yes ☐ No Type: \_\_\_\_\_

☐ Lime injection or fabric coating agent used: Type: \_\_\_\_\_ Feed rate: \_\_\_\_\_

Inlet gas flow rate (acfm): \_\_\_\_\_ Outlet gas flow rate (acfm) : \_\_\_\_\_

Inlet gas temperature (°F): \_\_\_\_\_ Outlet gas temperature (°F): \_\_\_\_\_

☐ This is the only control equipment on this air contaminant source

If not, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel

List all other air contaminant sources that are also vented to this control equipment: \_\_\_\_\_

List all egress point IDs (from Table 7-A) associated with this control equipment: \_\_\_\_\_

☐ Flare

Manufacturer: \_\_\_\_\_ Year installed: \_\_\_\_\_ Your ID for control equipment \_\_\_\_\_

**Describe this control equipment:** \_\_\_\_\_

Inlet gas flow rate (acfm): \_\_\_\_\_ **Pollutant(s) controlled:** ☐ PE/PM ☐ PE/PM<sub>10</sub> ☐ PE/PM<sub>2.5</sub> ☐ OC  
☐ VOC ☐ SO<sub>2</sub> ☐ NO<sub>x</sub> ☐ CO ☐ Pb ☐ Other \_\_\_\_\_

**Estimated capture efficiency (%)**: \_\_\_\_\_ **Basis for efficiency**: \_\_\_\_\_

**Design control efficiency (%)**: \_\_\_\_\_ **Basis for efficiency**: \_\_\_\_\_

**Operating control efficiency (%)**: \_\_\_\_\_ **Basis for efficiency**: \_\_\_\_\_

**Type**: ☐ Enclosed ☐ Elevated (open)  
**If Elevated (open)**: ☐ Air-assisted ☐ Steam-assisted ☐ Non-assisted  
**Ignition device**: ☐ Electric arc ☐ Pilot flame  
**Flame presence sensor**: ☐ Yes ☐ No  
Inlet gas flow rate (acfm): \_\_\_\_\_ Outlet gas flow rate (acfm): \_\_\_\_\_  
Inlet gas temperature (°F): \_\_\_\_\_ Outlet gas temperature (°F): \_\_\_\_\_

☐ **This is the only control equipment on this air contaminant source**  
**If not, this control equipment is**: ☐ Primary ☐ Secondary ☐ Parallel  
List all other air contaminant sources that are also vented to this control equipment: \_\_\_\_\_  
**List all egress point IDs (from Table 7-A) associated with this control equipment**: \_\_\_\_\_

☐ **Fugitive Dust Suppression**  
**Suppressant Type**: ☐ Water ☐ Chemical ☐ Calcium chloride ☐ Asphaltic cement ☐ Other \_\_\_\_\_  
**Method of application**: \_\_\_\_\_  
**Application rate (specify units)**: \_\_\_\_\_  
**Application frequency**: \_\_\_\_\_  
**List all egress point IDs (from Table 7-B) associated with this control strategy**: \_\_\_\_\_

☐ **NOx Reduction Technology**  
**Manufacturer**: \_\_\_\_\_ **Year installed**: \_\_\_\_\_ **Your ID for control equipment**: \_\_\_\_\_  
**Describe this control equipment**:  
**Pollutant(s) controlled**: ☐ PE/PM ☐ PE/PM<sub>10</sub> ☐ PE/PM<sub>2.5</sub> ☐ OC ☐ VOC  
☐ SO<sub>2</sub> ☐ NO<sub>x</sub> ☐ CO ☐ Pb ☐ Other \_\_\_\_\_  
**Estimated capture efficiency (%)**: \_\_\_\_\_ **Basis for efficiency**: \_\_\_\_\_  
**Design control efficiency (%)**: \_\_\_\_\_ **Basis for efficiency**: \_\_\_\_\_  
**Operating control efficiency (%)**: \_\_\_\_\_ **Basis for efficiency**: \_\_\_\_\_  
**NOx Reduction Type**: ☐ Selective Catalytic ☐ Non-Selective Catalytic ☐ Selective Non-Catalytic  
**Inlet temp.**: \_\_\_\_\_ **Outlet temp.**: \_\_\_\_\_  
**For Selective types only**:  
**Reagent type**: \_\_\_\_\_  
**Reagent injection rate (specify units)**: \_\_\_\_\_  
**Reagent slip (acfm)**: \_\_\_\_\_  
☐ **This is the only control equipment on this air contaminant source**  
**If not, this control equipment is**: ☐ Primary ☐ Secondary ☐ Parallel  
List all other air contaminant sources that are also vented to this control equipment: \_\_\_\_\_  
**List all egress point IDs (from Table 7-A) associated with this control equipment**: \_\_\_\_\_

☐ **Passive Filter**  
**Type**: ☐ Bin vent ☐ Paint booth filter ☐ Filter sock ☐ Other: \_\_\_\_\_ **Your ID for filter**: \_\_\_\_\_  
**Design control efficiency (%)**: \_\_\_\_\_ **Basis for efficiency**: \_\_\_\_\_  
**Change frequency**: \_\_\_\_\_  
Inlet gas flow rate (acfm): \_\_\_\_\_ Outlet gas flow rate (acfm): \_\_\_\_\_  
**List all egress point IDs (from Table 7-A) associated with this control equipment**: \_\_\_\_\_

☐ **Settling Chamber**  
**Manufacturer**: \_\_\_\_\_ **Year installed**: \_\_\_\_\_ **Your ID for control equipment**: \_\_\_\_\_



Describe this control equipment: \_\_\_\_\_

**Pollutant(s) controlled:** ☐ PE/PM ☐ PE/PM<sub>10</sub> ☐ PE/PM<sub>2.5</sub> ☐ OC ☐ VOC  
☐ SO<sub>2</sub> ☐ NO<sub>x</sub> ☐ CO ☐ Pb ☐ Other \_\_\_\_\_

**Estimated capture efficiency (%):** \_\_\_\_\_ **Basis for efficiency:** \_\_\_\_\_

**Design control efficiency (%):** \_\_\_\_\_ **Basis for efficiency:** \_\_\_\_\_

**Operating control efficiency (%):** \_\_\_\_\_ **Basis for efficiency:** \_\_\_\_\_

Length x Width x Height: \_\_\_\_\_

☐ **This is the only control equipment on this air contaminant source**

**If not, this control equipment is:** ☐ Primary ☐ Secondary ☐ Parallel

List all other air contaminant sources that are also vented to this control equipment: \_\_\_\_\_

List all egress point IDs (from Table 7-A) associated with this control equipment: \_\_\_\_\_

☐ Thermal Incinerator/Thermal Oxidizer

Manufacturer: \_\_\_\_\_ Year installed: \_\_\_\_\_ **Your ID for control equipment** \_\_\_\_\_

Describe this control equipment: \_\_\_\_\_

**Pollutant(s) controlled:** ☐ PE/PM ☐ PE/PM<sub>10</sub> ☐ PE/PM<sub>2.5</sub> ☐ OC ☐ VOC  
☐ SO<sub>2</sub> ☐ NO<sub>x</sub> ☐ CO ☐ Pb ☐ Other \_\_\_\_\_

**Estimated capture efficiency (%):** \_\_\_\_\_ **Basis for efficiency:** \_\_\_\_\_

**Design control efficiency (%):** \_\_\_\_\_ **Basis for efficiency:** \_\_\_\_\_

**Operating control efficiency (%):** \_\_\_\_\_ **Basis for efficiency:** \_\_\_\_\_

**Minimum operating temp. (°F) and sensor location:** \_\_\_\_\_ (See application instructions)

**Combustion chamber residence time (seconds):** \_\_\_\_\_

Inlet gas flow rate (acfm): \_\_\_\_\_ Outlet gas flow rate (acfm): \_\_\_\_\_

Inlet gas temperature (°F): \_\_\_\_\_ Outlet gas temperature (°F): \_\_\_\_\_

☐ **This is the only control equipment on this air contaminant source**

**If not, this control equipment is:** ☐ Primary ☐ Secondary ☐ Parallel

List all other air contaminant sources that are also vented to this control equipment: \_\_\_\_\_

List all egress point IDs (from Table 7-A) associated with this control equipment: \_\_\_\_\_

☐ Wet Scrubber

Manufacturer: \_\_\_\_\_ Year installed: \_\_\_\_\_ **Your ID for control equipment** \_\_\_\_\_

Describe this control equipment: \_\_\_\_\_

**Pollutant(s) controlled:** ☐ PE/PM ☐ PE/PM<sub>10</sub> ☐ PE/PM<sub>2.5</sub> ☐ OC ☐ VOC  
☐ SO<sub>2</sub> ☐ NO<sub>x</sub> ☐ CO ☐ Pb ☐ Other \_\_\_\_\_

**Estimated capture efficiency (%):** \_\_\_\_\_ **Basis for efficiency:** \_\_\_\_\_

**Design control efficiency (%):** \_\_\_\_\_ **Basis for efficiency:** \_\_\_\_\_

**Operating control efficiency (%):** \_\_\_\_\_ **Basis for efficiency:** \_\_\_\_\_

**Operating pressure drop range (inches of water):** Minimum: \_\_\_\_\_ Maximum: \_\_\_\_\_

**Type:** ☐ Impingement ☐ Packed bed ☐ Spray chamber ☐ Venturi ☐ Other: \_\_\_\_\_

pH range for scrubbing liquid: Minimum: \_\_\_\_\_ Maximum: \_\_\_\_\_

Is scrubber liquid recirculated? ☐ Yes ☐ No

Scrubber liquid flow rate (gal/min): \_\_\_\_\_

Scrubber liquid supply pressure (psig): \_\_\_\_\_ NOTE: This item for spray chambers only.

Inlet gas flow rate (acfm): \_\_\_\_\_ Outlet gas flow rate (acfm): \_\_\_\_\_

Inlet gas temperature (°F): \_\_\_\_\_ Outlet gas temperature (°F): \_\_\_\_\_

☐ **This is the only control equipment on this air contaminant source**

**If not, this control equipment is:** ☐ Primary ☐ Secondary ☐ Parallel

List all other air contaminant sources that are also vented to this control equipment: \_\_\_\_\_

List all egress point IDs (from Table 7-A) associated with this control equipment: \_\_\_\_\_

☐ Other

Type: describe \_\_\_\_\_  
 Manufacturer: \_\_\_\_\_ Year installed: \_\_\_\_\_ Your ID for control equipment \_\_\_\_\_

**Describe this control equipment:**

Pollutant(s) controlled: ☐ PE/PM ☐ PE/PM<sub>10</sub> ☐ PE/PM<sub>2.5</sub> ☐ OC ☐ VOC  
☐ SO<sub>2</sub> ☐ NO<sub>x</sub> ☐ CO ☐ Pb ☐ Other \_\_\_\_\_

Estimated capture efficiency (%): \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

Design control efficiency (%): \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

Operating control efficiency (%): \_\_\_\_\_ Basis for efficiency: \_\_\_\_\_

☐ **This is the only control equipment on this air contaminant source**

If not, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel

List all other air contaminant sources that are also vented to this control equipment: \_\_\_\_\_

List all egress point IDs (from Table 7-A) associated with this control equipment: \_\_\_\_\_

6. **Process Flow Diagram** - Attach a Process Flow Diagram to this application for this air contaminant source. See the application instructions for additional information.

7. **Modeling information:** (Note: items in bold in Tables 7-A and/or 7-B, as applicable, are required even if the tables do not otherwise need to be completed. If applicable, all information is required.) An air quality modeling analysis is required for PTIs and PTIOs for new installations or modifications, as defined in OAC rule 3745-31-01, where either the increase of toxic air contaminants from any air contaminant source or the increase of any other pollutant for all air contaminant sources combined exceed a threshold listed below. This analysis is to assure that the impact from the requested project will not exceed Ohio's Acceptable Incremental Impacts for criteria pollutants and/or Maximum Allowable Ground Level Concentrations (MAGLC) for toxic air contaminants. (See Ohio EPA, DAPC's Engineering Guide #69 for more information.) Permit requests that would have unacceptable impacts cannot be approved as proposed. See the line-by-line PTI/PTIO instructions for additional information.

Complete Tables 7-A and 7-C for stack emissions egress points and/or Table 7-B and 7-C for fugitive emissions egress points below if the requested allowable annual emission rate for this PTI or PTIO exceeds any of the following:

- Particulate Emissions (PE/PM<sub>10</sub>): 10 tons per year
- Sulfur Dioxide (SO<sub>2</sub>): 25 tons per year
- Nitrogen Oxides (NO<sub>x</sub>): 25 tons per year
- Carbon Monoxide (CO): 100 tons per year
- Lead (Pb): 0.6 ton per year
- Toxic Air Contaminants: 1 ton per year. Toxic air contaminants are identified in OAC rule 3745-114-01.

Complete Table 7-A below for each stack emissions egress point. An egress point is a point at which emissions from an air contaminant source are released into the ambient (outside) air. List each individual egress point on a separate pair of lines. In each case, use the dimensions of the tallest nearby (or attached) building, building segment or structure.

**Table 7-A, Stack Egress Point Information**

Company ID for the Egress Point	Type Code*	Dimensions or Diameter	Height from the Ground (ft)	Temp. at Max. Operation (F)	Flow Rate at Max. Operation (ACFM)	Minimum Distance to Fence Line (ft)
Company Description for the Egress Point	Shape: round, square, rectangular	Cross Sectional Area	Base Elevation (ft)	Building Height (ft)	Building Width (ft)	Building Length (ft)

① Company ID for the Egress Point	Type Code*	Dimensions or Diameter	Height from the Ground (ft)	Temp. at Max. Operation (F)	Flow Rate at Max. Operation (ACFM)	Minimum Distance to Fence Line (ft)
Company Description for the Egress Point	Shape: round, square, rectangular	Cross Sectional Area	Base Elevation (ft)	Building Height (ft)	Building Width (ft)	Building Length (ft)

① Company ID for the Egress Point	Type Code*	Dimensions or Diameter	Height from the Ground (ft)	Temp. at Max. Operation (F)	Flow Rate at Max. Operation (ACFM)	Minimum Distance to Fence Line (ft)
Company Description for the Egress Point	Shape: round, square, rectangular	Cross Sectional Area	Base Elevation (ft)	Building Height (ft)	Building Width (ft)	Building Length (ft)

① Company ID for the Egress Point	Type Code*	Dimensions or Diameter	Height from the Ground (ft)	Temp. at Max. Operation (F)	Flow Rate at Max. Operation (ACFM)	Minimum Distance to Fence Line (ft)
Company Description for the Egress Point	Shape: round, square, rectangular	Cross Sectional Area	Base Elevation (ft)	Building Height (ft)	Building Width (ft)	Building Length (ft)

\*Type codes for stack egress points:

- A. vertical stack (unobstructed): There are no obstructions to upward flow in or on the stack such as a rain cap.
- B. vertical stack (obstructed): There are obstructions to the upward flow, such as a rain cap, which prevents or inhibits the air flow in a vertical direction.
- C. non-vertical stack: The stack directs the air flow in a direction which is not directly upward.

Complete Table 7-B below for each fugitive emissions egress point. List each individual egress point on a separate line. Refer to the description of the fugitive egress point types below the table for use in completing the type column of the table. For an air contaminant source with multiple fugitive emissions egress points, include only the primary egress points.

**Table 7-B, Fugitive Egress Point Information**

① Company ID or Name for the Egress Point	Type* (check one) <input type="checkbox"/> Area <input type="checkbox"/> Volume	Area Source Dimensions (Length x Width, in feet)	Volume Source Dimensions (Height x Width, in feet)
Company Description for the Egress Point	Release Height (ft)	Exit Gas Temp. (only if in excess of 100°F) (°F)	Minimum Distance to the Fence Line (ft)

② Company ID or Name for the Egress Point	Type* (check one) <input type="checkbox"/> Area <input type="checkbox"/> Volume	Area Source Dimensions (Length x Width, in feet)	Volume Source Dimensions (Height x Width, in feet)
Company Description for the Egress Point	Release Height (ft)	Exit Gas Temp. (only if in excess of 100° F) (° F)	Minimum Distance to the Fence Line (ft)

② Company ID or Name for the Egress Point	Type* (check one) <input type="checkbox"/> Area <input type="checkbox"/> Volume	Area Source Dimensions (Length x Width, in feet)	Volume Source Dimensions (Height x Width, in feet)
Company Description for the Egress Point	Release Height (ft)	Exit Gas Temp. (only if in excess of 100° F) (° F)	Minimum Distance to the Fence Line (ft)

\*Types for fugitive egress point:

Area: an open fugitive source characterized as a horizontal area (L x W) with a release height. For irregular surfaces such as storage piles, enter dimensions of an average cross section; release height is entered as half of the maximum pile height. For process sources such as crushers, use the process opening (e.g., area of crusher hopper opening) and ignore material handling and storage emissions points.

Volume: an unpowered vertical opening, such as a window or roof monitor, characterized as a vertical area (W x H) with a release height, measured at the midpoint of the opening. Multiple openings in a building may be averaged, if necessary.

Use the same Company Name or ID for the Egress Point in Table 7-C that was used in Table 7-A or 7-B. See the line-by-line PTI/PTIO instructions for additional information.

Table 7-C, Egress Point Location		
Company Name or ID for the Egress Point (as identified above)	Egress Point Latitude	Egress Point Longitude
	deg min sec	deg min sec
	deg min sec	deg min sec
	deg min sec	deg min sec
	deg min sec	deg min sec
	deg min sec	deg min sec

8. Request for Enforceable Restrictions - As part of this permit application, do you wish to propose voluntary restrictions to limit emissions in order to avoid specific requirements listed below, (i.e., are you requesting state-only enforceable limits or state and federally enforceable limits to obtain synthetic minor status)?

☐ yes  
☐ no  
☐ not sure - please contact me to discuss whether this affects the facility.

If yes, why are you requesting enforceable restrictions? Check all that apply.

- ☐ a. to avoid being a major Title V source (see OAC rule 3745-77-01 and OAC rule 3745-31)  
☐ b. to avoid being a major MACT source (see OAC rule 3745-31-01)  
☐ c. to avoid being a major stationary source (see OAC rule 3745-31-01)  
☐ d. to avoid being a major modification (see OAC rule 3745-31-01)  
☐ e. to avoid an air dispersion modeling requirement (see Engineering Guide # 69)  
☐ f. to avoid BAT requirements (see OAC rule 3745-31-05(A)(3)(b))  
☐ g. to avoid another requirement. Describe: \_\_\_\_\_

If you checked a., b. or c., please attach a facility-wide potential to emit (PTE) analysis (for each pollutant) and synthetic minor strategy to this application. (See application instructions for definition of PTE.) If you checked d., please attach a net emission change analysis to this application. If you checked e., f. or g., please attach a description of the restrictions proposed and how compliance with those restrictions will be verified.

9. Continuous Emissions Monitoring – Does this air contaminant source utilize any continuous emissions monitoring (CEM) equipment for indicating or demonstrating compliance? This does not include continuous parametric monitoring systems.

☐ yes ☐ no

If yes, complete the following information.

Company Name or ID for the Egress Point \_\_\_\_\_

CEM Description \_\_\_\_\_

This CEM monitors (check all that apply):

☐ Opacity ☐ Flow ☐ CO ☐ NOx ☐ SO<sub>2</sub> ☐ THC ☐ HCl ☐ HF ☐ H<sub>2</sub>S ☐ TRS ☐ CO<sub>2</sub> ☐ O<sub>2</sub> ☐ PM

10. **EAC Forms** - The appropriate Emissions Activity Category (EAC) form(s) must be completed and attached for each air contaminant source unless a general permit is being requested. At least one complete EAC form must be submitted for each air contaminant source for the application to be considered complete. Refer to the list attached to the application instructions. Please indicate which EAC form corresponds to this air contaminant source.

\_\_\_\_\_

FOR OHIO EPA USE

FACILITY ID: \_\_\_\_\_

EU ID: \_\_\_\_\_ PTI  
#:

## EMISSIONS ACTIVITY CATEGORY FORM GENERAL PROCESS OPERATION

*This form is to be completed for each process operation when there is no specific emissions activity category (EAC) form applicable. If there is more than one end product for this process, copy and complete this form for each additional product (see instructions). Several State/Federal regulations which may apply to process operations are listed in the instructions. Note that there may be other regulations which apply to this emissions unit which are not included in this list.*

1. Reason this form is being submitted (Check one)

☐ New Permit    ☐ Renewal or Modification of Air Permit Number(s) (e.g. P001) \_\_\_\_\_

2. Maximum Operating Schedule: \_\_\_\_\_ hours per day ; \_\_\_\_\_ days per year

If the schedule is less than 24 hours/day or 365 days/year, what limits the schedule to less than maximum? See instructions for examples. \_\_\_\_\_

3. End product of this process: \_\_\_\_\_

4. Hourly production rates (indicate appropriate units). Please see the instructions for clarification of "Maximum" and "Average" for new versus existing operations:

Hourly	Rate	Units (e.g., widgets)
Average production		
Maximum production		

5. Annual production rates (indicate appropriate units) Please see the instructions for clarification of "Maximum" and "Actual" for new versus existing operations:

Annual	Rate	Units (e.g., widgets)
Actual production		
Maximum production		

6. Type of operation (please check one):

- ☐ Continuous
- ☐ Batch (please complete items below)

Minimum cycle\* time (minutes): \_\_\_\_\_

Minimum time between cycles (minutes): \_\_\_\_\_

Maximum number of cycles per daily 24 hour period: \_\_\_\_\_

(Note: include cycle time and set up/clean up time.)

\*"Cycle" refers to the time the equipment is in operation.

7. Materials used in process at maximum hourly production rate (add rows/pages as needed):

Material	Physical State at Standard Conditions	Principle Use	Amount**

\*\* Please indicate the amount **and** rate (e.g., lbs/hr, gallons/hr, lbs/cycle, etc.).

8. Please provide a narrative description of the process below (e.g., coating of metal parts using high VOC content coatings for the manufacture of widgets; emissions controlled by thermal oxidizer...):

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper is slightly off-white or aged. The lines are thin and dark, possibly black or dark blue ink. The overall appearance is that of a standard notebook or legal pad page.

## EMISSIONS ACTIVITY CATEGORY FORM FUEL BURNING OPERATION

*This form is to be completed for each fuel burning operation. State/Federal regulations which may apply to fuel burning operations are listed in the instructions. Note that there may be other regulations which apply to this emissions unit which are not included in this list*

1. Reason this form is being submitted (check one)

☐ New Permit      ☐ Renewal or Modification of Air Permit Number(s) (e.g. B001) \_\_\_\_\_

2. Maximum Operating Schedule: \_\_\_\_\_ hours per day; \_\_\_\_\_ days per year

If the schedule is less than 24 hours/day or 365 days/year, what limits the schedule to less than maximum? See instructions for examples. \_\_\_\_\_

3. Input Capacity (million Btu/hr):

Rated <i>(Indicate units if other than mmBtu/hr)</i>	Maximum <i>(Indicate units if other than mmBtu/hr)</i>	Normal <i>(Indicate units if other than mmBtu/hr)</i>

4. Output Capacity:

Rated <i>(lb steam/hr)</i>	Maximum <i>(lb steam/hr)</i>	Normal <i>(lb steam/hr)</i>

☐ Not applicable - operation does not produce steam.

5. Percent of Operating Time Used for:

Process: \_\_\_\_\_ %  
Space Heat: \_\_\_\_\_ %

6. Type of Draft (check one):

☐ Natural      ☐ Induced      ☐ Forced

7. Type of combustion monitoring (check one):

☐ Fuel/Air Ratio      ☐ Oxygen      ☐ None  
☐ Other (describe) \_\_\_\_\_



8. Type of Fuel Fired (complete all that apply):

Fuel*	Fired as...	Min. Heat Content (Btu/unit)	Max. % Ash	Max. % Sulfur	Max. Annual Fuel Use	Average Hourly Fuel Use	Maximum Hourly Fuel Use
Coal	<input type="checkbox"/> Primary <input type="checkbox"/> Backup				tons	lbs	lbs
No. 2 Fuel Oil	<input type="checkbox"/> Primary <input type="checkbox"/> Backup				gal	gal	gal
No. 6 Fuel Oil	<input type="checkbox"/> Primary <input type="checkbox"/> Backup				gal	gal	gal
Other** Oil	<input type="checkbox"/> Primary <input type="checkbox"/> Backup				gal	gal	gal
Natural Gas	<input type="checkbox"/> Primary <input type="checkbox"/> Backup				ft <sup>3</sup>	ft <sup>3</sup>	ft <sup>3</sup>
Wood	<input type="checkbox"/> Primary <input type="checkbox"/> Backup				tons	lbs	lbs
LPG	<input type="checkbox"/> Primary <input type="checkbox"/> Backup				gal	gal	gal
Other**	<input type="checkbox"/> Primary <input type="checkbox"/> Backup						
Other**	<input type="checkbox"/> Primary <input type="checkbox"/> Backup						

\* Please identify all combinations of fuels that are co-fired: \_\_\_\_\_

\*\* Identify other fuel(s): \_\_\_\_\_

**Coal-Fired Units**

9. Type of Coal Firing (check one):

- ☐ Pulverized-Wet Bottom      ☐ Hand-Fired    ☐ Chain Grate    ☐ Traveling Grate  
☐ Pulverized-Dry Bottom    ☐ Cyclones            ☐ Spreader Stoker    ☐ Fluidized Bed  
☐ Underfeed Stoker            ☐ Other (describe) \_\_\_\_\_

10. Flyash Reinjection:

☐ Yes ☐ No

11. Overfire Air:

☐ Yes ☐ No

**Oil-Fired Units**

12. Oil Preheater:

- ☐ Yes - Indicate Temperature \_\_\_\_\_ deg. F  
☐ No

## Model General Permit (MGP) Qualifying Criteria Document

**Source Description:** Natural gas extraction well site production line  
**MGP Number:** GP 12

A summary of the potential emissions expected from this source is as follows:

Equipment size	Model General Permit No.	Restricted Potential to Emit Summary (TPY)				
		PE	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC
See GP	GP12	2.07	0.1085	8.97	24.97	44.087

### Qualifying Criteria:

Answer the following questions by checking the appropriate box for the choice that describes the equipment/source for which you are applying for a permit. Then review the qualifying criteria described after the list.

- ☐Yes ☐No      1. Will the source emit more than 1 ton per year of any toxic air contaminant listed in OAC rule 3745-114-01(A)?
- ☐Yes ☐No      2. Is the source subject to other federal emission standards contained in 40 CFR, Parts 60 – 63, not indicated in the permit?
- ☐Yes ☐No      3. Is the air contaminant source(s) for which this general permit is being sought a part of a new major stationary source or a major modification (see OAC rule 3745-31-01)? If you are unsure, check with the appropriate Ohio EPA District Office or local air agency.
- ☐Yes ☐No      4. If the project associated with this air pollution source consists of multiple sources, does the sum of the restricted potential to emit (see the above table) for the sources equal or exceed any of the following thresholds?
- |                            |              |
|----------------------------|--------------|
| Carbon Monoxide            | 100 ton/year |
| Nitrogen Oxides            | 25 ton/year  |
| Sulfur Dioxide             | 25 ton/year  |
| PM                         | 10 ton/year  |
| Volatile Organic Compounds | 40 ton/year  |
- ☐Yes ☐No      5. Are HAPs emissions <10 tons/year single HAPS and <25 tons/year combined HAPS?
- ☐Yes ☐No      6. Can the source meet the allowable emissions limits and criteria contained in this model General Permit?

If the answer to questions 1 through 4 is "no" and 5 and 6 are "yes," the source meets the above "Qualifying Criteria."

## Model General Permit (MGP) Qualifying Criteria Document

**Unit Description:** Natural gas well condensate tanks and loading rack

**Qualifying Criteria:**

- |  |   |
|--|---|
| <input type="checkbox"/> Yes <input type="checkbox"/> No | 1. Does the condensate loading rack employ submerged or bottom fill?  |
| <input type="checkbox"/> Yes <input type="checkbox"/> No | 2. Are the condensate storage tanks <19,815 gallons with <2.176 psi content, or <39,894 gallons with <0.508 psi content?          |
| <input type="checkbox"/> Yes <input type="checkbox"/> No | 3. Does the owner or operator agree to a limitation of no more than 8,736,000 gallons of condensate per rolling, 12-month period? |

If the answers to questions 1 through 3 are "yes" the facility meets the above "Qualifying Criteria."

**Unit Description:** Unpaved roadways and parking areas, with a maximum of **10,000** vehicle miles traveled per year

**Qualifying Criteria:**

- |  |   |
|--|---|
| <input type="checkbox"/> Yes <input type="checkbox"/> No | 1. Does this facility have unpaved roadways and parking areas?  |
| <input type="checkbox"/> Yes <input type="checkbox"/> No | 2. Has the owner or operator identified in their application an uncontrolled silt content of the road material of less than or equal to 10 percent?   |
| <input type="checkbox"/> Yes <input type="checkbox"/> No | 3. Is the owner or operator willing to keep the total vehicles miles traveled (VMT) by all vehicles on the unpaved roads and parking areas at the facility to less than or equal to <b>10,000 miles</b> ? |
| <input type="checkbox"/> Yes <input type="checkbox"/> No | 4. Does the owner or operator agree to submit a labeled diagram of unpaved roadways and parking areas at the facility with the application for a general permit?  |
| <input type="checkbox"/> Yes <input type="checkbox"/> No | 5. Are the unpaved roadways and parking areas regulated in any manner under OAC rule 3745-17-12 (in Cuyahoga Co.) or OAC rule 3745-17-13 (in Jefferson Co.)?  |

If the answer to questions 1 through 4 are "yes" and the answer to question 5 is "no", the facility meets the above "Qualifying Criteria".

## Model General Permit (MGP) Qualifying Criteria Document

**Unit Description:** Natural gas internal combustion engine, 215 horsepower or less, and manufactured between 7/1/08 and 12/31/10

**Qualifying Criteria:**

- ☐Yes ☐No 1. Was the engine manufactured between 7/1/08 and 12/31/10?
- ☐Yes ☐No 2. Is the engine a natural gas engine rated at no greater than 215 horsepower?
- ☐Yes ☐No 3. Is the engine certified by the manufacturer to emission standards that meet or are less than the standards identified in Table 1 of the Standards of Performance for Stationary Spark Ignition Internal Combustion Engines, as applicable to natural gas engines of the same maximum engine power and date of manufacturer, as follows?
- 2.0 grams of nitrogen oxides per horsepower-hour
- 1.0 grams of volatile organic compounds per horsepower-hour
- 4.0 grams of carbon monoxide horsepower-hour
- ☐Yes ☐No 4. Will the engine be installed, maintained, and operated according to the manufacturer's specifications, instructions, and/or operating manual?
- ☐Yes ☐No 5. Will the manufacturer's operating manual and/or instructions be maintained on site and be readily available to the operator?

If the answers to questions 1 through 5 are "yes" the facility meets the above "Qualifying Criteria".

**Unit Description:** Natural gas production system

**Qualifying Criteria:**

- ☐Yes ☐No 1. Are the only emissions points from the gas handling system, from dehydration (if utilized) and/or fugitive equipment leaks?
- ☐Yes ☐No 2. Is the total rating of all heaters/boilers on site  $\leq 4.89$  MMBtu/hr?

If the answers to questions 1 through 2 are "yes" the facility meets the above "Qualifying Criteria".

## Model General Permit (MGP) Qualifying Criteria Document

**Unit Description:**

Excess gas combustion device/flare (enclosed smokeless)

**Qualifying Criteria:**

- ☐ Yes   ☐ No   1. Will the unit meet 99.8% destruction of VOCs?
- ☐ Yes   ☐ No   2. Does the device meet the requirements of 40 CFR Part 60.18 and/or Part 63.11?
- ☐ Yes   ☐ No   3. Will a pilot flame be maintained and monitored at all times?

If the answers to questions 1 through 3 are "yes" the facility meets the above "Qualifying Criteria".

By signing below, the owner or operator's signature shall constitute personal affirmation that the applicant meets the qualifying criteria contained above, and shall subject the signatory to liability under applicable state laws forbidding false or misleading statements.

\_\_\_\_\_  
Authorized Signature (for facility)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Title

**Lipp, David**

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**From:** Shear, Aaron <aaron.shear@epa.state.oh.us>  
**Sent:** Friday, June 24, 2011 4:25 PM  
**To:** David Lipp  
**Cc:** Simmers, Rick <Rick.Simmers@dnr.state.oh.us> (Rick.Simmers@dnr.state.oh.us)  
**Subject:** NY Marcellus Drill Cutting Studies  
**Attachments:** Radiological Survey Report - Marcellus Drill Cuttings 4-26-2010.pdf; Final\_Rev\_Draft\_Marcellus\_Rpt.pdf

Good Afternoon David,

Attached are two radiological reports pertaining to Marcellus Shale drilling cuttings and disposal at NY landfills. I thought that you may be interested in reading and discussing them internally.

They are copyrighted to prevent people from misusing the information, so please do not distribute them publically unless you want me to discuss those options with my contact in NY.

Thanks and have a great weekend.

**Aaron Shear**  
**Environmental Specialist**



**Division of Materials and Waste Management**  
**Solid Waste Compliance and Inspection Support Unit**  
50 West Town Street, Suite 700  
P.O. Box 1049  
Direct 614-728-5350 • Fax 614-728-5315



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**Lipp, David**

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**From:** Stephen Helmer  
**Sent:** Monday, June 20, 2011 12:31 PM  
**To:** David Lipp  
**Subject:** FW: Draft Ohio EPA Surface Water Rule - Pretreatment and Indirect Discharge Program

fyi

**From:** Ohio EPA [mailto:ohioepa-mkt@mailwc.rnmk.com]  
**Sent:** Monday, June 20, 2011 12:29 PM  
**To:** Stephen Helmer  
**Subject:** Draft Ohio EPA Surface Water Rule - Pretreatment and Indirect Discharge Program

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You are being sent this email because you either requested to be on the distribution list for Division of Surface Water rulemakings or because of your known interest in the content of these rules. Please reply to this email if you no longer wish to be on this list or go to the following web page to update your subscription information: <http://ohioepa.custhelp.com/ci/documents/detail/2/subscriptionpage>.

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### **Draft Pretreatment (OAC 3745-3) and Indirect Discharge (OAC 3745-36) Program Rules**

At this time, the Agency is soliciting comments on draft revisions to the pretreatment and indirect discharge program rules. Minor revisions are planned to these rules as part of the five year review process.

The comment deadline for these rules is July 20, 2011.

For more information, please go to [www.epa.ohio.gov/dsw/rules/draft\\_pretreatment\\_jun11.aspx](http://www.epa.ohio.gov/dsw/rules/draft_pretreatment_jun11.aspx).

If you submit comments regarding this rulemaking to the email address below, you should receive a reply email within 2 business days indicating the receipt of your comments. If you do not receive a reply, please call the contact number below or submit your comments by fax.

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Rule Coordinator, Ohio EPA  
Divison of Surface Water  
Phone: 614-644-2001  
Fax: 614-644-2745  
Email: [dsw\\_rulecomments@epa.state.oh.us](mailto:dsw_rulecomments@epa.state.oh.us)



**Lipp, David**

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**From:** Shear, Aaron <aaron.shear@epa.state.oh.us>  
**Sent:** Tuesday, June 14, 2011 2:57 PM  
**To:** 'Simmers, Rick'; David Lipp  
**Subject:** Drill Cutting Article & Site Visit

Hello Rick and David,

How did the ODH/ODNR drill site visit go several weeks ago? Has there been any other discussion or determination as to sampling the drill cutting for radionuclides or other constituents? The Division of Materials and Waste Management is still interested in participating in any drill cutting sampling activities during future site visits.

Here's a relevant article that I thought you may be interested in reading - [More Than 200 Show Up For Forum On Drill-Cuttings - Bath, NY](#)

Best Regards,

**Aaron Shear**  
**Environmental Specialist**



**Environmental  
Protection Agency**

**Division of Materials and Waste Management**  
**Solid Waste Compliance and Inspection Support Unit**  
**50 West Town Street, Suite 700**  
**P.O. Box 1049**  
**Direct 614-728-5350 · Fax 614-728-5315**



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**Lipp, David**

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**From:** Stevenson, Laurie <laurie.stevenson@epa.state.oh.us>  
**Sent:** Thursday, June 09, 2011 4:19 PM  
**To:** 'Chris.Perry@dnr.state.oh.us'; 'Heidi Hetzel-Evans'; Husted, John F.; 'mike.hallfrisch@dnr.state.oh.us'; 'mike.mccormac@dnr.state.oh.us'; 'rick.simmers@dnr.state.oh.us'; 'ted.lozier@dnr.state.oh.us'; 'thomas.tugend@dnr.state.oh.us'; 'tom.tomastik@dnr.state.oh.us'; Shear, Aaron; Cirker, Benjamin; Hall, Brian; Lowe, Chuck; Nygaard, Eric; Goicochea, Joe; Weiss, Kristopher; Burkleca, Lee; Taliaferro, Lindsay; Baker, Mike; Eggert, Michael; Hopkins, Mike; Parsons, Misty; Settles, Mike; Laake, Ryan; Freeman, Tracy; Harcarik, Tom; Nickel, Brian; Kniss, Donna; Underwood, Dan; Adams, Eric; Gomes, Erm; Snell, Fred; Riley, Keith; Rice, Nancy; Blasick, Rich; DiFranco, Stivo; Saines, Steve; Williams, Steve; Wilson, Virginia; Chuck McCracken; Michael Snee; Rebecca Fugitt; 'robert.owen@odh.ohio.gov'; Stephen Helmer; David Lipp  
**Subject:** Follow-up items from our inter-agency shale team meeting on 5/4  
**Attachments:** drillersfactsheetV.8.doc; Marcellus Shale-factsheetV.10.doc

Hello everyone. First, I apologize that you have not received the notes from our past meeting. Unfortunately, my laptop has crashed and I'm unsure of whether our IT shop will be able to recover my hard drive files as they work to repair things. I'll get these out to everyone in the event my notes are retrieved.

I think there were a few action items for the team as a follow-up to our meeting, and hopefully everyone can remember what they've committed to getting out to the group. To this end, I'm passing along two DRAFT fact sheets for review by team members. One is a general fact sheet on OEPA requirements for drillers. I mentioned during our past meeting that we were working on this. The second is a revised version of our general fact sheet that we had previously posted on the website. It's been updated to reflect options for brine/flowback management. For our ODNR team members, although the fact sheet for drillers is intended to focus on OEPA's regs., there are some references to ODNR's requirements, contact info., etc. in it. If we need to discuss/revise any of these items, let me know.

Feel free to mark up the attached electronic copies and send revisions to me. I would like to receive feedback on both items by June 30<sup>th</sup>.

Also, we are scheduled for our next inter-agency team meeting on Tuesday, July 12<sup>th</sup> here at Ohio EPA (Center for Excellence, 6<sup>th</sup> floor) from 1:30-4:00. I'll get a draft agenda together for review/comment here soon.

Thanks,  
Laurie

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This message was secured by ZixCorp<sup>(R)</sup>.

## **Lipp, David**

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**From:** Stevenson, Laurie <laurie.stevenson@epa.state.oh.us>  
**Sent:** Thursday, June 09, 2011 11:41 AM  
**To:** David Lipp  
**Subject:** RE: Marcellus Shale Gas Drilling Meetings Mailing List

Hi David! Will do. I'm going to send out some information today for the team, so will make sure you're on the list for this and future info.  
Laurie

**From:** David Lipp [mailto:David.Lipp@odh.ohio.gov]  
**Sent:** Thursday, June 09, 2011 9:25 AM  
**To:** Stevenson, Laurie  
**Subject:** Marcellus Shale Gas Drilling Meetings Mailing List

Laurie,

I work with Chuck McCracken and Steve Helmer at ODH and have been recently assigned to the Marcellus Shale project with regard to the technologically enhanced naturally occurring radioactive material (TENORM) component. Please add me to your distribution list for information being sent out and for future meeting notices. If you have any questions or there is more information that you need, please let me know.

Thank you,

David R. Lipp  
Senior Health Physicist  
Bureau of Radiation Protection, Technical Support  
Ohio Department of Health  
(614) 728-0884  
[david.lipp@odh.ohio.gov](mailto:david.lipp@odh.ohio.gov)

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## Lipp, David

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**From:** Chuck McCracken  
**Sent:** Thursday, June 09, 2011 8:19 AM  
**To:** David Lipp  
**Subject:** FW: Letter from OEPA to ODNR regarding brine disposal  
**Attachments:** 5-16-11DirectorLettertoODNR.pdf

**From:** Laurie Stevenson [mailto:laurie.stevenson@epa.state.oh.us]  
**Sent:** Tuesday, May 17, 2011 12:31 PM  
**To:** Chris.Perry@dnr.state.oh.us; Heidi Hetzel-Evans; john.husted@dnr.state.oh.us; mike.hallfrisch@dnr.state.oh.us; mike.mccormac@dnr.state.oh.us; rick.simmers@dnr.state.oh.us; ted.lozier@dnr.state.oh.us; thomas.tugend@dnr.state.oh.us; tom.tomastik@dnr.state.oh.us; Aaron Shear; Benjamin Cirker; Brian Hall; Brian Nickel; Chuck Lowe; Dan Underwood; Donna Kniss; Eric Adams; Eric Nygaard; Erm Gomes; Fred Snell; Joe Goicochea; Keith Riley; Kristopher Weiss; Lee Burkleca; Lindsay Taliaferro; Michael Eggert; Mike Baker; Mike Hopkins; Mike Settles; Misty Parsons; Nancy Rice; Rich Blasick; Ryan Laake; Steve Saines; Steve Williams; Stivo DiFranco; Tom Harcarik; Tracy Freeman; Virginia Wilson; Chuck McCracken; Michael Snee; Rebecca Fugitt; robert.owen@odh.ohio.gov; Stephen Helmer  
**Subject:** Letter from OEPA to ODNR regarding brine disposal

Hello everyone. I'm passing along a letter that went to ODNR from OEPA yesterday regarding disposal of oil/gas brine into POTW systems. Some of you received a copy yesterday, but I wanted to make sure others on the shale team see it. If you have questions, call me at 4-2344.

For the OEPA program folks, if you get either media or legislative inquiries about this, please direct them here (Penny Seipel or Tracy Freeman for legislative and Chris Abbruzzese for media).

Thanks,  
Laurie

Ohio Environmental Protection Agency Unless otherwise provided by law,

this communication and any response to it constitutes a public record.



# Ohio EPA's Regulations:

## A Fact Sheet for Shale Drillers

### DRAFT FACT SHEET

Ohio EPA

June 3, 2011

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### Introduction

With the state sitting over the Marcellus and Utica shale deposits and advancements in drilling technology, it is expected that Ohio will see a significant increase in oil and natural gas drilling in the near future.

For companies intending to drill in the shale regions of the state, this fact sheet summarizes the regulatory requirements and permits you may need from Ohio EPA. These requirements apply to any drilling operation, but are more likely to apply to activities associated with horizontal drilling and hydraulic fracturing operations.



Understanding these requirements and working early in the process with Ohio EPA and other regulatory agencies overseeing shale drilling can minimize permitting delays for you and help ensure that drilling is done in a manner that protects our citizens and natural resources. Table 1. of this fact sheet provides a summary of the ODNR and Ohio EPA regulatory authority over oil/gas drilling activities.

Ohio EPA's 401 Water Quality Certification (WQC) program requires you get authorization if site construction activities will have an impact on wetlands, streams, rivers or other waters of the state. Ohio EPA also regulates sources of air emissions, and may require air permits for some of the sources at the drill site. Any materials meeting the definition of solid waste sent off-site for disposal from the site must be properly managed.

Drillers also need to obtain permits from the Ohio Department of Natural Resources, Division of Mineral Resources Management (ODNR-DMRM). ODNR, DMRM regulates disposal of brine<sup>1</sup> and drilling fluids from oil and gas drilling/production. ODNR regulates Class II underground injection wells used for disposal of waste fluids from oil and gas drilling/production operations and transporters hauling these fluids in Ohio. ODNR-DMRM should be one of your first contacts if you plan to drill in Ohio. For more information, see their Web site at [www.dnr.state.oh.us/oil/default/tabid/10371/Default.aspx](http://www.dnr.state.oh.us/oil/default/tabid/10371/Default.aspx).

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<sup>1</sup> "Brine" includes all saline geological formation water resulting from, obtained from, or produced in connection with the exploration, drilling, or production of oil or gas, including saline water resulting from, obtained from, or produced in connection with well stimulation or plugging of a well. (R.C. 1509.01(U))

## Constructing in Areas that Impact Waters of the State

If construction at your drill site will impact wetlands, streams or other waters of the state, you must obtain authorization for these impacts from Ohio EPA under a Section 401 Water Quality Certification (WQC).

Examples of activities that require a 401 WQC include:

- Excavating or placing fill material in a wetland, stream or lake;
- Stream piping, rerouting or straightening;
- Channelization;
- Dredging a wetlands to create a pond;
- Dredging or placing fill into waters of the state;
- Crossing streams or wetlands to construct roadways, water or wastewater piping.

Under the 401 program, you must mitigate wetland impacts by restoring or enhancing wetlands elsewhere. You may also be required to address stream impacts by restoring other stream segments or purchasing conservation easements within the watershed. Your plan for addressing these impacts (called a mitigation plan) is submitted with your 401 application and is reviewed by Ohio EPA.

If impacted streams or wetlands are covered under jurisdiction of the U.S. Army Corps of Engineers (Corps), you must also obtain a 404 permit from Corps to authorize impacts to these resources.



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the

Some isolated wetlands are not covered under the federal Clean Water Act, but are regulated under Ohio's isolated wetlands law. If you will impact these areas, you must get an Isolated Wetland Permit from Ohio EPA

Ohio EPA and the Corps regulate impacts to wetlands and other waters, and each has different authority and jurisdictions. This is why you need to work closely with both agencies. Ohio EPA coordinates with the Corps in the 401/404 permit application processes as much as possible. You must obtain the 404 permit and 401 certification before you start construction on the drill site.

### IMPORTANT POINTS

You should consider hiring a consultant to inspect the site, as some wetlands may not be easily identifiable by reviewing documents, such as National Wetland Inventory maps.

Start the 401 process early, as on-site review and categorization of wetlands is primarily completed during the growing season.

Due to rule requirements for public notification, acquiring an individual 401 WQC can take 3-6 months.

The best option to avoid delays and environmental impact is to look for potential drilling sites where construction will not have any impacts to streams, wetlands or other waters of the state.



For information on Ohio EPA's 401 WQC requirements, visit [www.epa.ohio.gov/dsw/401/index.aspx](http://www.epa.ohio.gov/dsw/401/index.aspx).

For information on U.S. Army Corp 404 permits, visit [www.usace.army.mil/CECW/Pages/reg\\_permit.aspx](http://www.usace.army.mil/CECW/Pages/reg_permit.aspx).

## Air Permits for Emission Sources

For units or activities that emit air pollutants, Ohio EPA may require a permit-to-install and operate (PTIO). The terms and conditions of a PTIO usually include emission limits, operating conditions, monitoring and recordkeeping requirements.

A drill site may have several emission sources, including

- Diesel or gas-powered engines/generators
- Gas/water/oil separators
- Produced water storage tanks
- Gas-fired wellhead compressors
- Tri-ethylene glycol (TEG) dehydrators
- Emissions from material handling, truck transportation, etc.
- Tank truck loading operations



A PTIO is required for all emission sources, unless specifically exempt under the Ohio Administrative Code (OAC). Current exemptions include:

- 1) "De minimis" exemption (OAC rule 3745-15-05): Applies to sources that emit less than 10 pounds per day of any air contaminant and less than one ton (2,000 pounds) per year of any hazardous air pollutant or combination of hazardous air pollutants.
- 2) Permanent rule exemption (OAC rule 3745-31-03(A)(1)): This rule includes a list of more than 45 sources that are exempt from permitting. Examples include small boilers, detergent-based parts washers, small storage tanks and other sources having minimal air emissions or meeting certain size criteria.

If you are claiming a permanent rule exemption, you are not required to provide notification to Ohio EPA.

If you are claiming a de minimis exemption, you are not required to provide notification, but it is recommended that you contact your local Ohio EPA district office or Local Air Agency (LAA) about the source. They can review your de minimis calculations and put information in the file about your exemption to assist future/new inspectors that may be reviewing your site information.

- 3) Permit-by-rule exemption (OAC rule 3745-31-03(A)(4)): A permit-by-rule (PBR) exemption covers 11 categories of small emission sources. Under the PBR, you are not required to get a permit for the source, but must follow all the requirements in the rules, including meeting emission limits and operational restrictions, and keeping records. You must also file a one-page PBR notification to Ohio EPA.

The first step in getting an air permit is to discuss the equipment you plan to install with the air pollution permit writer located at the Ohio EPA district office or Local Air Agency (LAA) having jurisdiction over the area where your drill site will be located. This discussion is important so that you know what equipment needs an air permit, what applications must be submitted and how long it will take to receive a permit. You can submit your permit application electronically through Ohio EPA's eBusiness Center, or by hard copy directly to your district office/LAA.

For more information on Ohio EPA's air permitting process, exemptions and electronic copies of application forms, visit the Ohio EPA, Division of Air Pollution Control (DAPC) website at [www.epa.ohio.gov/dapc/permits/permits.aspx](http://www.epa.ohio.gov/dapc/permits/permits.aspx). Ohio EPA's eBusiness Center is at <https://ebiz.epa.ohio.gov/>.

## Managing Brine/Flowback Water from Drilling Operations

Brine, including flowback water, picks up minerals from the shale formation including iron, calcium, magnesium, barium, sulfur, suspended solids and a significant concentration of soluble salts.

It may also contain low levels of naturally occurring radioactive elements such as radium, carried up from the shale. It also contains total dissolved solids (TDS), including chlorides, sodium and sulfates. High levels of TDS in streams, rivers and lakes can impair water quality and kill aquatic life.

Lagoons or pits used on-site for temporary storage of flowback water as it is being either recycled or collected prior to off-site shipment and disposal are regulated by ODNR, DMRM. Ohio does not authorize long-term storage of flowback water in on-site lagoons and recommends the use of tanks as an alternative, particularly at drilling sites in close proximity to drinking water resource or where ground water is susceptible to contamination.

ODNR, DMRM has the exclusive authority for brine disposal in Ohio. Ohio prohibits the direct discharge of brine/flowback water into waters of the state. In addition, disposal of brine at municipal wastewater sewage plants (also called publicly owned treatment works or POTW) in Ohio is NOT authorized.

Brine, including flowback water, disposed of in Ohio must be sent to an ODNR-permitted Class II injection well. Where feasible, recycling and reusing flowback water is strongly encouraged. Some materials may be suitable for road surface application, under authorization from ODNR. For more information on brine management options, contact ODNR, DMRM.

### Total Dissolved Solids (TDS)

Total dissolved solids in brine/flowback water include minerals, metals and soluble salts such as sodium, chlorides and sulfates.

TDS in the form of soluble salts in brine/flowback water from shale drilling can reach

### EXPLORE OPTIONS TO RECYCLE FLOWBACK WATER

In some situations, flowback water can be recycled and reused at the drill site. Having multiple drill sites in close proximity makes it more cost-effective to reuse flowback water.

## Using Best Management Practices to Control Storm Water Run-off and Erosion

Oil and gas exploration and production sites are not required to obtain a permit from EPA for storm water management under the federal Clean Water Act (CWA). The CWA provisions, do, however, remain enforceable at a site if there is a discharge of any reportable quantities of materials or if a discharge from the site contributes to a violation of a water quality standard. For more information on the federal storm water exemption, see U.S. EPA's website at <http://cfpub.epa.gov/npdes/stormwater/oilgas.cfm>.

Although a storm water permit from Ohio EPA is not required, ODNR requires drillers to implement best management practices (BMPs) for sediment/erosion control as part of their drilling authorization permit. For more information, see ODNR's Rainwater and Land Development Manual at <http://www.dnr.state.oh.us/water/rainwater/default/tabid/9186/Default.aspx>

Ohio EPA also encourages oil and gas field operators to use BMPs to minimize discharges of pollutants in storm water, including sediment, both during and after construction, to help protect surface water during storms. Some examples of BMPs include:

- Installing perimeter controls, sediment basins/traps and a stabilized construction entrance as the first step in construction.
- Isolating drainage from the site to eliminate storm water run-on through the site.
- Using a stabilized entrance or wheel wash station to minimizing mud on streets/roads from vehicle drag out.



- Containing and properly disposing of all drilling fluids, including fluids associated with setting the casing and plugging operations.
- Inspecting the site on a regular basis and after a rainfall to determine if additional measures are needed to stabilize the site (e.g., additional stone or temporary cover such as seed and mulch).

Constructing a sediment basin/trap can be more effective and economical than a silt fence in controlling stormwater run-off, because of less maintenance.

## Use of Water from a Public Water System and other Water Withdrawals

Between 4 and 6 million gallons of fresh water (called production water) are used to hydraulically fracture a Marcellus or Utica shale gas well. Production water usually comes from nearby lakes, rivers and wells. In some instances, a public water system may serve as the source of production water.

If you intend to pump water from a public water supply system to your drill site, you are required to have proper containment devices at the point of connection to protect the public water system in accordance with Ohio EPA's requirements in OAC 3745-95. At a minimum, this includes a reduced pressure principle backflow assembly at the service connection. An approved air gap separation should be maintained at the drill sight. If an air gap isolation is not maintained at the drill pad, an air gap separation will be required at the service connection.

For more information on Ohio EPA's backflow prevention and cross-connection control regulations, see the Division of Drinking and Ground Waters (DDAGW) factsheet at [www.epa.ohio.gov/portals/28/documents/engineering/Cross-connection%20flier.pdf](http://www.epa.ohio.gov/portals/28/documents/engineering/Cross-connection%20flier.pdf).

Any operation with the capacity to withdraw water at a quantity greater than 100,000 gallons per day from waters of the state must register with ODNR, Division of Soil and Water Resources in accordance with ORC 1521.16. Depending on the location and type of withdrawal other requirements may apply. For more information, see ODNR's website at [www.dnr.state.oh.us/tabid/4262/Default.aspx](http://www.dnr.state.oh.us/tabid/4262/Default.aspx).

## **Managing Drill Cuttings**

Oil and gas exploration and production wastes, including drill cuttings and muds, are exempt from regulation as hazardous waste under Subtitle C of the Resource Conservation and Recovery Act (RCRA). However, federal law does not exempt these wastes from being considered a solid waste under Subtitle D of RCRA and under state law, particularly for cuttings that are shipped off the drill site for disposal.

Cuttings are a mixture of soil, rock, and other matter brought to the surface during drilling of the wellbore. If you are disposing of cuttings at the drill site, this activity is regulated by ODNR. Where drill cuttings come into contact with sources of contamination (e.g. synthetic drilling muds, oils and chemical additives) and cuttings are to be shipped off-site for disposal, Ohio EPA considers these materials contaminated soil, which must be managed as a solid waste. These solid wastes must be sent to a permitted solid waste disposal facility.

Ohio EPA will also consider proposals to beneficially reuse contaminated soils, if constituents within the material are below applicable U.S. EPA residential regional screening levels (RSLs). If you are interested in beneficially reusing contaminated soils, you must get authorization for this activity from Ohio EPA's Division of Materials and Waste Management (DMWM). For more information on the solid waste requirements or beneficial reuse options, contact Ohio EPA, DMWM.

Because certain geologic formations contain low levels of naturally occurring radioactive materials (NORM), some drill cuttings may contain low levels of radioactive materials. The Ohio Department of Health, Bureau of Radiation Protection, is the regulatory authority for the disposal of waste containing sources of radiation. You should contact ODH for more information and guidance on potential sampling requirements for NORM. See the ODH, Bureau of Radiation Protection Web site at [www.odh.ohio.gov/odhPrograms/rp/nm\\_saf/nm\\_saf1.aspx](http://www.odh.ohio.gov/odhPrograms/rp/nm_saf/nm_saf1.aspx).

## Spill Containment, Control and Release Reporting Requirements

If you handle oil or oil products at your drill site, you could be subject to the Spill Prevention Control and Countermeasure (SPCC) regulations under 40 CFR Part 112. Basic requirements of the SPCC rules include:

- 1) Provide adequate secondary containment for oil or petroleum product storage and transfer areas to contain any releases; and
- 2) Prepare and implement a written SPCC plan.

### NOTE

Under the SPCC regulations, the definition of oil and oil products is very broad, including: vegetable/soluble oils, heating oil, crude oil, mineral oil, gasoline and diesel fuel.

Whether you are subject to the SPCC requirements depends on your storage capacity for oil/oil products. If you have a total aboveground storage capacity of 1,320 gallons or more, you are subject to the SPCC requirements.

When determining if you are subject to the rules, the total capacity of your tanks or containers must be considered, not the actual amount of oil/oil products stored. If you are storing oil/petroleum products in containers less than 55 gallons in size, you do not need to include these in calculating your SPCC storage capacity.



The SPCC requirements are federal regulations and the program is administered by U.S. EPA. There are no state regulations administered by Ohio EPA for this program. For basic information about the SPCC requirements, see Ohio EPA's fact sheet at [www.epa.ohio.gov/portals/41/sb/publications/spcc.pdf](http://www.epa.ohio.gov/portals/41/sb/publications/spcc.pdf). If you have questions about the SPCC regulations, see U.S. EPA's website at [www.epa.gov/emergencies/content/spcc/index.htm](http://www.epa.gov/emergencies/content/spcc/index.htm).

Under Ohio's laws, spills or releases involving a petroleum product (diesel fuel, gasoline, hydraulic fluid, etc.) must be reported, if the spill/release exceeds reportable quantities. The reportable quantities are:

- Any amount of petroleum that causes a film or sheen on a waterway.
- Any spill or release to the environment (not contained on the spiller's property) of 25 gallons or more.

If you are uncertain how much was released, reporting is encouraged. Petroleum product spills of 25 gallons or more on or adjacent to a public roadway are always reportable. Ohio EPA encourages reporting for petroleum spills of any amount if the spill threatens a waterway, or will enter a waterway or storm sewer in the future due to rain or snowmelt if unaddressed. For more information on Ohio EPA's spill/release reporting procedures, see [www.epa.state.oh.us/portals/30/ersis/er/docs/Guide%20to%20ER.pdf](http://www.epa.state.oh.us/portals/30/ersis/er/docs/Guide%20to%20ER.pdf).

## Keys to Successful Permitting

- ✓ **Select your site carefully.** When configuring your drill site, plan to avoid impacts to wetlands and streams. This could eliminate the need for state 401 water quality certification and a permit from the U.S. Army Corps of Engineers.
- ✓ **File complete permit applications.** Include all the information needed on application forms and any additional materials such as design drawings, process information, equipment specifications, etc., required as part of the application. Forgetting even small items can add time to the review process.
- ✓ **Respond promptly to information requests from the district office or local air agency.** The faster you respond, the faster we can continue to process your permits.
- ✓ **Some pre-construction activities may be authorized before you actually get your permit, but it's important to talk with the district office (or local air agency) about what may be allowed before you begin any site activity.**
- ✓ **Once you get your permits, read and make sure you understand them.** If you have questions about any of your compliance requirements under your permits, ask Ohio EPA.

## Other Regulatory Requirements You Need to Know

Ohio EPA's regulatory requirements are only one area of compliance. For drilling operations, it is very important you also understand your compliance responsibilities under the Ohio Department of Natural Resources (ODNR) regulations. ODNR's Division of Minerals Resource Management (ODNR-DMRM) has primary regulatory authority over oil and gas drilling activity in Ohio, including permitting requirements and rules for well construction, siting, design and operation. ODNR, DMRM regulates brine disposal and issues permits for Class II underground injection wells used for disposal of waste fluids from oil and gas drilling/production operations. In addition, ODNR regulates transporters hauling these fluids in Ohio.

ODNR-DMRM should be one of your first contacts if you plan to drill in Ohio. For more information, see their website at <http://www.ohiodnr.com/tabid/10352/Default.aspx>.

For more information about Ohio EPA's requirements, see our website at <http://www.epa.state.oh.us/shale.aspx>.

## Other Agencies You Should Know

### U.S. Army Corps of Engineers

#### Huntington District

[www.lrh.usace.army.mil/or/permits/](http://www.lrh.usace.army.mil/or/permits/)

#### Buffalo District

[www.lrb.usace.army.mil/orgs/reg/index.htm](http://www.lrb.usace.army.mil/orgs/reg/index.htm)

#### Louisville District

[www.lrl.usace.army.mil/](http://www.lrl.usace.army.mil/)

#### Pittsburgh District

[www.lrp.usace.army.mil/or/or-f/permits.htm](http://www.lrp.usace.army.mil/or/or-f/permits.htm)

**Table 1. Summary of ODNR and Ohio EPA regulatory authority over oil/gas drilling activities.**

	Ohio Department of Natural Resources	Ohio Environmental Protection Agency
Drilling in the shale deposits	<ul style="list-style-type: none"> <li>✓ Issues permits for drilling oil/gas wells in Ohio.</li> <li>✓ Sets requirements for proper location, design and construction requirements for wells.</li> <li>✓ Inspects and oversees drilling activity.</li> <li>✓ Requires controls and procedures to prevent discharges and releases.</li> <li>✓ Requires that wells no longer used for production are properly plugged.</li> <li>✓ Requires registration for facility owners with the capacity to withdraw water at a quantity greater than 100,000 gallons per day.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Requires drillers obtain authorization for construction activity where there is an impact to a wetland, stream, river or other water of the state.</li> <li>✓ Requires drillers obtain a permit-to-install and operate (PTIO) for units or activities that have emissions of air pollutants,</li> </ul>
Wastewater and drill cutting management at drill sites	<ul style="list-style-type: none"> <li>✓ Sets design requirements for on-site pits/lagoons used to store drill cuttings and flowback water.</li> <li>✓ Requires proper closure of on-site pits/lagoons after drilling is completed.</li> <li>✓ Sets standards for managing drill cuttings and flowback derived sediments left on-site.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Requires proper management of drill cuttings that are considered solid waste and shipped off-site for disposal.</li> </ul>
Brine/flowback water disposal	<ul style="list-style-type: none"> <li>✓ Regulates the disposal of brine and oversees operation of Class II wells used to inject oil/gas-related waste fluids.</li> <li>✓ Reviews specifications and issues permits for Class II wells.</li> </ul>	

	<ul style="list-style-type: none"> <li>✓ Sets design/construction requirements for Class II underground injection wells.</li> <li>✓ Responds to questions/concerns from citizens regard safety of drinking water from private wells from oil/natural gas drilling.</li> </ul>	
Flowback water hauling	<ul style="list-style-type: none"> <li>✓ Registers transporters hauling brine and oil/gas drilling-related wastewater in Ohio.</li> </ul>	
Pumping water to the drill site from a public water supply system		<ul style="list-style-type: none"> <li>✓ Requires proper containment devices at the point of connection to protect the public water system.</li> </ul>

# Ohio Environmental Protection Agency

## Drilling for Natural Gas in the Marcellus and Utica Shales: Environmental Regulatory Basics

DRAFT Fact Sheet, June 2011 (Revised)

### Introduction

This fact sheet provides a basic overview of natural gas drilling in the Marcellus and Utica Shale regions of Ohio and the potential environmental issues associated with these activities. It also summarizes the regulatory authority of the Ohio Environmental Protection Agency (Ohio EPA) and Ohio Department of Natural Resources (ODNR), Division of Mineral Resources Management (DMRM) over drilling activity and wastewater management.

### Where are the Marcellus and Utica Shale Deposits?

Together, the Marcellus and Utica Shale regions extend across New York, Pennsylvania, Maryland, West Virginia, eastern Ohio and portions of Kentucky and Tennessee. The deposits sit between 7,000 and 12,000 feet below ground, with the Marcellus Shale at more shallow depths than the Utica.

Both are important geologic formations because they hold large reserves of natural gas. Researchers estimate the Marcellus Shale alone could contain as much as 363 trillion cubic feet of natural gas, enough to satisfy U.S. energy demands for about 14 years.

Most drilling is now occurring in the Marcellus Shale region of Pennsylvania, with growing interest in West Virginia and New York. Because the Marcellus Shale is much thinner on its western edge, Ohio is experiencing far less Marcellus Shale drilling than other states. However, Ohio will likely see a significant increase in future drilling, as much of the state sits over the Utica Shale formation, which experts also predict holds large natural gas reserves and potentially oil.

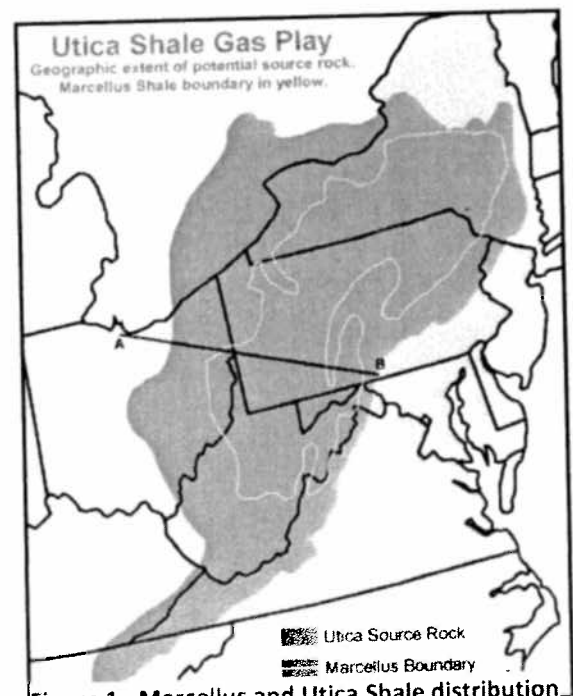


Figure 1. Marcellus and Utica Shale distribution.

## How is natural gas extracted from a shale formation?

Natural gas is extracted from the shale through a two-step process of horizontal drilling and hydraulic fracturing. To start, a production well is drilled thousands of feet downward and then gradually angled out horizontally through the shale deposit. The well is drilled horizontally to maximize the ability to capture natural gas once the shale is hydraulically fractured.

After the well is drilled, a mixture of water, sand and chemical additives is injected at very high pressure to

fracture the shale. This part of the process, called hydraulic fracturing (or “fracing”) is a technique used in the oil and gas industry since the 1950s. The sand (called a “proppant”) keeps the fractured shale open and serves as a conduit for extracting the natural gas. The chemical additives reduce potential problems in drilling and gas production, such as bacterial build-up and the formation of scale, mineral deposits and rust.

It can take up to four million gallons of fresh water to hydraulically fracture a single well. The water used in the fracturing process usually comes from a stream, river, reservoir or lake close to the drill site, or in some cases, from a local municipal water plant.

## What happens to water after hydraulic fracturing is complete?

Most of the water used to fracture the shale remains trapped thousands of feet underground after it is injected. However, internal pressure in the geologic formation forces some of the water (around 15-20 percent of the total volume injected) back to the surface through the well bore.

Most of this brine, also called “flowback” or “frac” water comes back to the surface within seven to ten days after it is pumped into the well. It is stored temporarily in lagoons or tanks before it is shipped off-site for disposal. It is usually transported off-site by truck, although some companies are exploring rail transportation as an option.

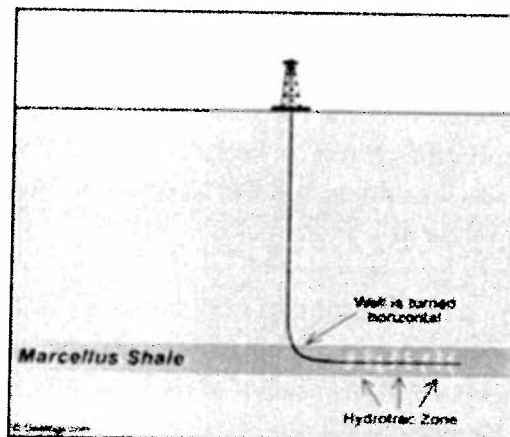


Figure 2. Horizontal drilling process. Graphic reprinted with permission of [www.Geology.com](http://www.Geology.com)

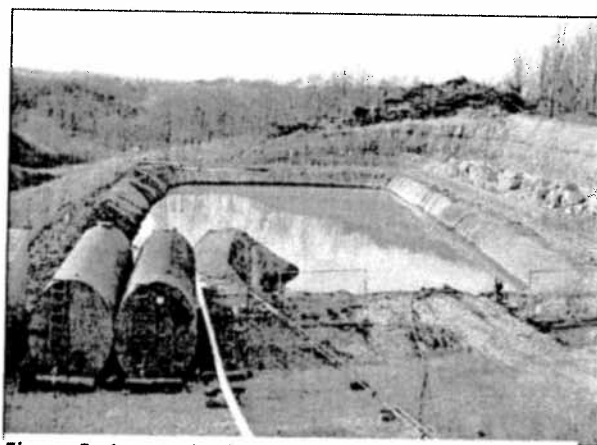
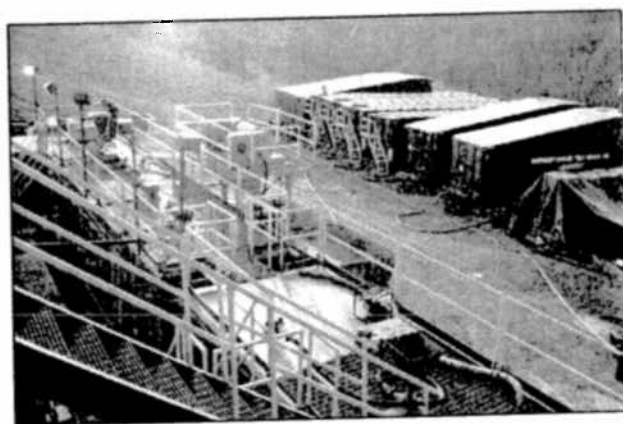


Figure 3. An on-site lagoon is one option for temporary storage of drill cuttings/fluids and flowback water.

Brine is sent to facilities that have permits to inject fluids into deep injection wells (called Class II wells) thousands of feet underground.

Because of disposal costs, some drilling companies are recycling and reusing flowback water from one drill site to another. Having multiple drill sites in close proximity makes it more cost-effective to reuse flowback water. The concentration of iron, bacteria, suspended solids and other contaminants in flowback water is another factor in determining whether it can be reused.



**Figure 4.** As an alternative to a lagoon, some drill sites use a series of frac tanks to collect flowback water.

### **How is drilling in the Marcellus and Utica Shales regulated in Ohio?**

ODNR, DMRM has primary regulatory authority over oil and gas drilling activity in Ohio, including rules for well construction, siting, design and operation. ODNR, DMRM regulates disposal of brine<sup>1</sup> and drilling fluids from oil and gas drilling/production. ODNR regulates Class II underground injection wells used for disposal of waste fluids from oil and gas drilling/production operations and transporters hauling these fluids in Ohio.



**Figure 5.** Frac tanks are hauled by trailer to a disposal location. Photo reprinted with permission of [www.marcellus-shale.us](http://www.marcellus-shale.us)

Ohio EPA's water quality certification requirements help reduce impacts to wetlands, streams, rivers or other waters of the state from the construction of a drill site. Ohio EPA also regulates sources of air emissions, and may require air permits for some of the sources at the drill site. Finally, any materials meeting the definition of solid waste sent off-site for disposal must be properly managed, either at a solid waste landfill, or beneficially reused, as authorized by Ohio EPA's Division of Waste and Materials Management (DWMW).

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<sup>1</sup> "Brine" includes all saline geological formation water resulting from, obtained from, or produced in connection with the exploration, drilling, or production of oil or gas, including saline water resulting from, obtained from, or produced in connection with well stimulation or plugging of a well. (R.C. 1509.01(U))



**Table 1. Summary of ODNR, DMRM and Ohio EPA regulatory authority over drilling and management of flowback water**

	Ohio Department of Natural Resources	Ohio Environmental Protection Agency
Drilling in the shale deposits	<ul style="list-style-type: none"> <li>✓ Issues permits for drilling oil/gas wells in Ohio.</li> <li>✓ Sets requirements for proper location, design and construction requirements for wells.</li> <li>✓ Inspects and oversees drilling activity.</li> <li>✓ Requires controls and procedures to prevent discharges and releases.</li> <li>✓ Requires that wells no longer used for production are properly plugged.</li> <li>✓ Requires registration for facility owners with the capacity to withdraw water at a quantity greater than 100,000 gallons per day.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Requires drillers obtain authorization for construction activity where there is an impact to a wetland, stream, river or other water of the state.</li> <li>✓ Requires drillers obtain a permit-to-install and operate (PTIO) for units or activities that have emissions of air pollutants.</li> </ul>
Wastewater and drill cutting management at drill sites	<ul style="list-style-type: none"> <li>✓ Sets design requirements for on-site pits/lagoons used to store drill cuttings and brine/flowback water.</li> <li>✓ Requires proper closure of on-site pits/lagoons after drilling is completed.</li> <li>✓ Sets standards for managing drill cuttings and sediments left on-site.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Requires proper management of drill cuttings or sediments that are considered solid waste and shipped off-site for disposal.</li> </ul>
Brine/flowback water disposal	<ul style="list-style-type: none"> <li>✓ Regulates the disposal of brine and oversees operation of Class II wells used to inject oil/gas-related waste fluids.</li> <li>✓ Reviews specifications and issues permits for Class II wells.</li> <li>✓ Sets design/construction requirements for Class II underground injection wells.</li> <li>✓ Responds to questions/concerns from citizens regard safety of drinking water from private wells from oil/natural gas drilling.</li> </ul>	
Brine/flowback water hauling	<ul style="list-style-type: none"> <li>✓ Registers transporters hauling brine and oil/gas drilling-related wastewater in Ohio.</li> </ul>	
Pumping water to the drill site from a public water supply system		<ul style="list-style-type: none"> <li>✓ Requires proper containment devices at the point of connection to protect the public water system.</li> </ul>

## What are the environmental concerns with drilling and hydraulic fracturing?

With growing media coverage of shale drilling, citizens are becoming more aware and concerned about potential impacts of drilling activity on them, the environment and their communities.

Because Ohio has a significant number of Class II underground injection control wells with permits to dispose of flowback water, many drilling companies have been transporting flowback water into Ohio for deep-well disposal.

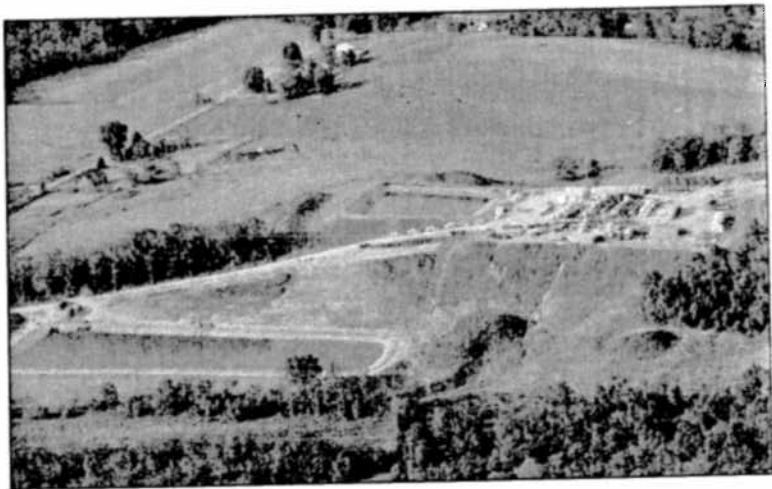


Figure 6. A Marcellus Shale drill site in Pennsylvania. Photo reprinted with permission of [www.marcellus-shale.us](http://www.marcellus-shale.us).

Brine, including flowback water, picks up minerals from the shale formation including iron, calcium, magnesium, barium, sulfur, suspended solids and a significant concentration of soluble salts. It may also contain low levels of naturally occurring radioactive elements such as radium, carried up from the shale. It also contains total dissolved solids (TDS), including chlorides, sodium and sulfates. High levels of TDS in streams, rivers and lakes can impair water quality and kill aquatic life.

ODNR, DMRM has the exclusive authority for brine disposal in Ohio. Ohio prohibits the direct discharge of brine/flowback water into waters of the state. In addition, disposal of brine at municipal wastewater sewage plants (also called publicly owned treatment works or POTW) in Ohio is NOT authorized.

Brine, including flowback water, disposed of in Ohio must be sent to an ODNR-permitted Class II injection well. Where feasible, recycling and reusing flowback water is strongly encouraged. Some materials may be suitable for road surface application, under authorization from ODNR. For more information on brine management options, contact ODNR, DMRM.

### Total Dissolved Solids (TDS)

A general term for organic and inorganic particles suspended in a liquid which easily pass through a small membrane filter system.

Total dissolved solids in brine/flowback water include minerals, metals and soluble salts such as sodium, chlorides and sulfates.

TDS in the form of soluble salts in brine/flowback water from shale drilling can reach concentrations as high as 200,000 mg/l. As a point of comparison, the salinity of seawater from concentrated salts is about 35,000 mg/l.