



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

7/22/2013

Certified Mail

Mr. Gerald Alberts  
Antero Resources - Wayne Pad  
1625 17th Street  
Suite 300  
Denver, CO 80202

No	TOXIC REVIEW
No	SYNTHETIC MINOR TO AVOID MAJOR NSR
No	CEMS
No	MACT/GACT
No	NSPS
No	NESHAPS
No	NETTING
No	MODELING SUBMITTED
No	SYNTHETIC MINOR TO AVOID TITLE V
No	FEDERALLY ENFORCABLE PTIO (FEPTIO)
No	SYNTHETIC MINOR TO AVOID MAJOR GHG

RE: FINALAIR POLLUTION PERMIT-TO-INSTALL AND OPERATE

Facility ID: 0661005014  
Permit Number: P0114893  
Permit Type: Initial Installation  
County: Noble

Dear Permit Holder:

Enclosed please find a final Ohio Environmental Protection Agency (EPA) Air Pollution Permit-to-Install and Operate (PTIO) which will allow you to install, modify, and/or operate the described emissions unit(s) in the manner indicated in the permit. Because this permit contains conditions and restrictions, please read it very carefully. In this letter you will find the information on the following topics:

- **How to appeal this permit**
- **How to save money, reduce pollution and reduce energy consumption**
- **How to give us feedback on your permitting experience**
- **How to get an electronic copy of your permit**

**How to appeal this permit**

The issuance of this PTIO is a final action of the Director and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within thirty (30) days after notice of the Director's action. The appeal must be accompanied by a filing fee of \$70.00, made payable to "Ohio Treasurer Josh Mandel," which the Commission, in its discretion, may reduce if by affidavit you demonstrate that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the Director within three (3) days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office, Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission  
77 South High Street, 17th Floor  
Columbus, OH 43215

## **How to save money, reduce pollution and reduce energy consumption**

The Ohio EPA is encouraging companies to investigate pollution prevention and energy conservation. Not only will this reduce pollution and energy consumption, but it can also save you money. If you would like to learn ways you can save money while protecting the environment, please contact our Office of Compliance Assistance and Pollution Prevention at (614) 644-3469. Additionally, all or a portion of the capital expenditures related to installing air pollution control equipment under this permit may be eligible for financing and State tax exemptions through the Ohio Air Quality Development Authority (OAQDA) under Ohio Revised Code Section 3706. For more information, see the OAQDA website: [www.ohioairquality.org/clean\\_air](http://www.ohioairquality.org/clean_air)

## **How to give us feedback on your permitting experience**

Please complete a survey at [www.epa.ohio.gov/dapc/permitsurvey.aspx](http://www.epa.ohio.gov/dapc/permitsurvey.aspx) and give us feedback on your permitting experience. We value your opinion.

## **How to get an electronic copy of your permit**

This permit can be accessed electronically via the eBusiness Center: Air Services in Microsoft Word format or in Adobe PDF on the Division of Air Pollution Control (DAPC) Web page, [www.epa.ohio.gov/dapc](http://www.epa.ohio.gov/dapc) by clicking the "Search for Permits" link under the Permitting topic on the Programs tab.

If you have any questions, please contact Ohio EPA DAPC, Southeast District Office at (740)385-8501 or the Office of Compliance Assistance and Pollution Prevention at (614) 644-3469.

Sincerely,



Michael W. Ahern, Manager  
Permit Issuance and Data Management Section, DAPC

Cc: Ohio EPA-SEDO



**FINAL**

**Division of Air Pollution Control  
Permit-to-Install and Operate  
for  
Antero Resources - Wayne Pad**

Facility ID:	0661005014
Permit Number:	P0114893
Permit Type:	Initial Installation
Issued:	7/22/2013
Effective:	7/22/2013
Expiration:	7/22/2023





**Division of Air Pollution Control**  
**Permit-to-Install and Operate**  
for  
Antero Resources - Wayne Pad

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## Authorization

Facility ID: 0661005014  
Application Number(s): A0047989  
Permit Number: P0114893  
Permit Description: Initial installation PTIO for Oil and Gas Well-Site Production Operations including unpaved roadways and parking areas  
Permit Type: Initial Installation  
Permit Fee: \$2,000.00  
Issue Date: 7/22/2013  
Effective Date: 7/22/2013  
Expiration Date: 7/22/2023  
Permit Evaluation Report (PER) Annual Date: Jan 1 - Dec 31, Due Feb 15

This document constitutes issuance to:

Antero Resources - Wayne Pad  
Ohio Rte 566 N  
Sarahsville, OH 43754

of a Permit-to-Install and Operate for the emissions unit(s) identified on the following page.

Ohio Environmental Protection Agency (EPA) District Office or local air agency responsible for processing and administering your permit:

Ohio EPA DAPC, Southeast District Office  
2195 Front Street  
Logan, OH 43138  
(740)385-8501

The above named entity is hereby granted this Permit-to-Install and Operate for the air contaminant source(s) (emissions unit(s)) listed in this section pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the described emissions unit(s) will operate in compliance with applicable State and federal laws and regulations.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency

  
Scott J. Nally  
Director



## Authorization (continued)

Permit Number: P0114893  
Permit Description: Initial installation PTIO for Oil and Gas Well-Site Production Operations including unpaved roadways and parking areas

Permits for the following Emissions Unit(s) or groups of Emissions Units are in this document as indicated below:

<b>Emissions Unit ID:</b>	<b>F001</b>
Company Equipment ID:	F001
Superseded Permit Number:	
General Permit Category and Type:	Not Applicable
<b>Emissions Unit ID:</b>	<b>F002</b>
Company Equipment ID:	HR001
Superseded Permit Number:	
General Permit Category and Type:	Not Applicable
<b>Emissions Unit ID:</b>	<b>P001</b>
Company Equipment ID:	D001
Superseded Permit Number:	
General Permit Category and Type:	Not Applicable
<b>Emissions Unit ID:</b>	<b>P004</b>
Company Equipment ID:	Flare
Superseded Permit Number:	
General Permit Category and Type:	Not Applicable
<b>Emissions Unit ID:</b>	<b>T001</b>
Company Equipment ID:	Storage Tanks
Superseded Permit Number:	
General Permit Category and Type:	Not Applicable

**Group Name: NG Engines**



**Final Permit-to-Install and Operate**  
Antero Resources - Wayne Pad  
**Permit Number:** P0114893  
**Facility ID:** 0661005014  
**Effective Date:** 7/22/2013

## **A. Standard Terms and Conditions**



**1. What does this permit-to-install and operate ("PTIO") allow me to do?**

This permit allows you to install and operate the emissions unit(s) identified in this PTIO. You must install and operate the unit(s) in accordance with the application you submitted and all the terms and conditions contained in this PTIO, including emission limits and those terms that ensure compliance with the emission limits (for example, operating, recordkeeping and monitoring requirements).

**2. Who is responsible for complying with this permit?**

The person identified on the "Authorization" page, above, is responsible for complying with this permit until the permit is revoked, terminated, or transferred. "Person" means a person, firm, corporation, association, or partnership. The words "you," "your," or "permittee" refer to the "person" identified on the "Authorization" page above.

The permit applies only to the emissions unit(s) identified in the permit. If you install or modify any other equipment that requires an air permit, you must apply for an additional PTIO(s) for these sources.

**3. What records must I keep under this permit?**

You must keep all records required by this permit, including monitoring data, test results, strip-chart recordings, calibration data, maintenance records, and any other record required by this permit for five years from the date the record was created. You can keep these records electronically, provided they can be made available to Ohio EPA during an inspection at the facility. Failure to make requested records available to Ohio EPA upon request is a violation of this permit requirement.

**4. What are my permit fees and when do I pay them?**

There are two fees associated with permitted air contaminant sources in Ohio:

- PTIO fee. This one-time fee is based on a fee schedule in accordance with Ohio Revised Code (ORC) section 3745.11, or based on a time and materials charge for permit application review and permit processing if required by the Director.

You will be sent an invoice for this fee after you receive this PTIO and payment is due within 30 days of the invoice date. You are required to pay the fee for this PTIO even if you do not install or modify your operations as authorized by this permit.

- Annual emissions fee. Ohio EPA will assess a separate fee based on the total annual emissions from your facility. You self-report your emissions in accordance with Ohio Administrative Code (OAC) Chapter 3745-78. This fee assessed is based on a fee schedule in ORC section 3745.11 and funds Ohio EPA's permit compliance oversight activities. Unless otherwise specified, facilities subject to one or more synthetic minor restrictions must use Ohio EPA's "Air Services" to submit annual emissions associated with this permit requirement. Ohio EPA will notify you when it is time to report your emissions and to pay your annual emission fees.

**5. When does my PTIO expire, and when do I need to submit my renewal application?**

This permit expires on the date identified at the beginning of this permit document (see "Authorization" page above) and you must submit a renewal application to renew the permit. Ohio EPA will send a renewal notice to you approximately six months prior to the expiration date of this permit. However, it is



very important that you submit a complete renewal permit application (postmarked prior to expiration of this permit) even if you do not receive the renewal notice.

If a complete renewal application is submitted before the expiration date, Ohio EPA considers this a timely application for purposes of ORC section 119.06, and you are authorized to continue operating the emissions unit(s) covered by this permit beyond the expiration date of this permit until final action is taken by Ohio EPA on the renewal application.

**6. What happens to this permit if my project is delayed or I do not install or modify my source?**

This PTIO expires 18 months after the issue date identified on the "Authorization" page above unless otherwise specified if you have not (1) started constructing the new or modified emission sources identified in this permit, or (2) entered into a binding contract to undertake such construction. This deadline can be extended by up to 12 months, provided you apply to Ohio EPA for this extension within a reasonable time before the 18-month period has ended and you can show good cause for any such extension.

**7. What reports must I submit under this permit?**

An annual permit evaluation report (PER) is required in addition to any malfunction reporting required by OAC rule 3745-15-06 or other specific rule-based reporting requirement identified in this permit. Your PER due date is identified in the Authorization section of this permit.

**8. If I am required to obtain a Title V operating permit in the future, what happens to the operating provisions and PER obligations under this permit?**

If you are required to obtain a Title V permit under OAC Chapter 3745-77 in the future, the permit-to-operate portion of this permit will be superseded by the issued Title V permit. From the effective date of the Title V permit forward, this PTIO will effectively become a PTI (permit-to-install) in accordance with OAC rule 3745-31-02(B). The following terms and conditions will no longer be applicable after issuance of the Title V permit: Section B, Term 1.b) and Section C, for each emissions unit, Term a)(2).

The PER requirements in this permit remain effective until the date the Title V permit is issued and is effective, and cease to apply after the effective date of the Title V permit. The final PER obligation will cover operations up to the effective date of the Title V permit and must be submitted on or before the submission deadline identified in this permit on the last day prior to the effective date of the Title V permit.

**9. What are my obligations when I perform scheduled maintenance on air pollution control equipment?**

You must perform scheduled maintenance of air pollution control equipment in accordance with OAC rule 3745-15-06(A). If scheduled maintenance requires shutting down or bypassing any air pollution control equipment, you must also shut down the emissions unit(s) served by the air pollution control equipment during maintenance, unless the conditions of OAC rule 3745-15-06(A)(3) are met. Any emissions that exceed permitted amount(s) under this permit (unless specifically exempted by rule) must be reported as deviations in the annual permit evaluation report (PER), including nonexempt excess emissions that occur during approved scheduled maintenance.



**10. Do I have to report malfunctions of emissions units or air pollution control equipment? If so, how must I report?**

If you have a reportable malfunction of any emissions unit(s) or any associated air pollution control system, you must report this to the Ohio EPA DAPC, Southeast District Office in accordance with OAC rule 3745-15-06(B). Malfunctions that must be reported are those that result in emissions that exceed permitted emission levels. It is your responsibility to evaluate control equipment breakdowns and operational upsets to determine if a reportable malfunction has occurred.

If you have a malfunction, but determine that it is not a reportable malfunction under OAC rule 3745-15-06(B), it is recommended that you maintain records associated with control equipment breakdown or process upsets. Although it is not a requirement of this permit, Ohio EPA recommends that you maintain records for non-reportable malfunctions.

**11. Can Ohio EPA or my local air agency inspect the facility where the emission unit(s) is/are located?**

Yes. Under Ohio law, the Director or his authorized representative may inspect the facility, conduct tests, examine records or reports to determine compliance with air pollution laws and regulations and the terms and conditions of this permit. You must provide, within a reasonable time, any information Ohio EPA requests either verbally or in writing.

**12. What happens if one or more emissions units operated under this permit is/are shut down permanently?**

Ohio EPA can terminate the permit terms associated with any permanently shut down emissions unit. "Shut down" means the emissions unit has been physically removed from service or has been altered in such a way that it can no longer operate without a subsequent "modification" or "installation" as defined in OAC Chapter 3745-31.

You should notify Ohio EPA of any emissions unit that is permanently shut down by submitting<sup>1</sup> a certification that identifies the date on which the emissions unit was permanently shut down. The certification must be submitted by an authorized official from the facility. You cannot continue to operate an emissions unit once the certification has been submitted to Ohio EPA by the authorized official.

You must comply with all recordkeeping and reporting for any permanently shut down emissions unit in accordance with the provisions of the permit, regulations or laws that were enforceable during the period of operation, such as the requirement to submit a PER, air fee emission report, or malfunction report. You must also keep all records relating to any permanently shutdown emissions unit, generated while the emissions unit was in operation, for at least five years from the date the record was generated.

Again, you cannot resume operation of any emissions unit certified by the authorized official as being permanently shut down without first applying for and obtaining a permit pursuant to OAC Chapter 3745-31.

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<sup>1</sup> Permittees that use Ohio EPA's "Air Services" can mark the affected emissions unit(s) as "permanently shutdown" in the facility profile along with the date the emissions unit(s) was permanently removed and/or disabled. Submitting the facility profile update will constitute notifying of the permanent shutdown of the affected emissions unit(s).



**13. Can I transfer this permit to a new owner or operator?**

You can transfer this permit to a new owner or operator. If you transfer the permit, you must follow the procedures in OAC Chapter 3745-31, including notifying Ohio EPA or the local air agency of the change in ownership or operator. Any transferee of this permit must assume the responsibilities of the transferor permit holder.

**14. Does compliance with this permit constitute compliance with OAC rule 3745-15-07, "air pollution nuisance"?**

This permit and OAC rule 3745-15-07 prohibit operation of the air contaminant source(s) regulated under this permit in a manner that causes a nuisance. Ohio EPA can require additional controls or modification of the requirements of this permit through enforcement orders or judicial enforcement action if, upon investigation, Ohio EPA determines existing operations are causing a nuisance.

**15. What happens if a portion of this permit is determined to be invalid?**

If a portion of this permit is determined to be invalid, the remainder of the terms and conditions remain valid and enforceable. The exception is where the enforceability of terms and conditions are dependent on the term or condition that was declared invalid.



**Final Permit-to-Install and Operate**  
Antero Resources - Wayne Pad  
**Permit Number:** P0114893  
**Facility ID:** 0661005014  
**Effective Date:** 7/22/2013

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



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) 5. a) and b)
  - 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. Multiple emissions units contained in this permit must comply with various federal New Source Performance Standards (NSPS) or various Maximum Achievable Control Technology (MACT)/Generally Available Control Technologies (GACT) standards. The complete NSPS/MACT/GACT 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. The permittee shall comply with any applicable requirements of 40 CFR Part 60 Subpart OOOO once it becomes rule.
3. The requirements of this permit are not intended to supersede any Ohio Department of Natural Resources requirements.
4. 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.
5. Air Toxics Requirements
  - a) **Monitoring and Record Keeping Requirements**

Emission units P001 and P004 are subject to the following monitoring and recordkeeping requirements:

    - (1) The PTIO application for this/these emissions units, P001 and P004 was evaluated based on the actual materials and the design parameters of the emissions units' exhaust system, as specified by the permittee. The "Toxic Air Contaminant Statute", ORC 3704.03(F), was applied to this/these emissions unit(s) for each toxic air contaminant listed in OAC rule 3745-114-01, using data from the permit application; and modeling was performed for each toxic air contaminant(s) emitted at over one ton per year using an air dispersion model such as SCREEN3, AERMOD, or ISCST3, or other Ohio EPA approved model. The predicted 1-hour maximum ground-level concentration result(s) from the approved air dispersion model, was compared to the Maximum Acceptable Ground-Level Concentration (MAGLC), calculated as described in the Ohio EPA guidance document entitled "Review of New Sources of Air Toxic Emissions, Option A", as follows:



- a. the exposure limit, expressed as a time-weighted average concentration for a conventional 8-hour workday and a 40-hour workweek, for each toxic compound(s) emitted from the emissions unit(s), (as determined from the raw materials processed and/or coatings or other materials applied) has been documented from one of the following sources and in the following order of preference (TLV was and shall be used, if the chemical is listed):
  - i. threshold limit value (TLV) from the American Conference of Governmental Industrial Hygienists (ACGIH) "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices"; or
  - ii. STEL (short term exposure limit) or the ceiling value from the American Conference of Governmental Industrial Hygienists (ACGIH) "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices"; the STEL or ceiling value is multiplied by 0.737 to convert the 15-minute exposure limit to an equivalent 8-hour TLV.
- b. The TLV is divided by ten to adjust the standard from the working population to the general public (TLV/10).
- c. This standard is/was then adjusted to account for the duration of the exposure or the operating hours of the emissions unit(s), i.e., 24 hours per day and 7 days per week, from that of 8 hours per day and 5 days per week. The resulting calculation was (and shall be) used to determine the Maximum Acceptable Ground-Level Concentration (MAGLC):

$$TLV/10 \times 8/X \times 5/Y = 4 TLV/XY = MAGLC$$

- d. The following summarizes the results of dispersion modeling for the significant toxic contaminants (emitted at 1 or more tons/year) or "worst case" toxic contaminant(s):

Toxic Contaminant: Benzene(Hexane)

TLV (mg/m3): 1,597.26 (Benzene)

Maximum Hourly Emission Rate (lbs/hr): (Benzene)

Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 8.272

MAGLC (ug/m3): 38.03

The permittee, has demonstrated that emissions of Benzene, from emissions units P001 and P004 is calculated to be less than eighty per cent of the maximum acceptable ground level concentration (MAGLC); any new raw material or processing agent shall not be applied without evaluating each component toxic air contaminant in accordance with the "Toxic Air Contaminant Statute", ORC 3704.03(F).



- (2) Prior to making any physical changes to or changes in the method of operation of the emissions unit(s), that could impact the parameters or values that were used in the predicted 1-hour maximum ground-level concentration, the permittee shall re-model the change(s) to demonstrate that the MAGLC has not been exceeded. Changes that can affect the parameters/values used in determining the 1-hour maximum ground-level concentration include, but are not limited to, the following:
- a. changes in the composition of the materials used or the use of new materials, that would result in the emission of a new toxic air contaminant with a lower Threshold Limit Value (TLV) than the lowest TLV previously modeled;
  - b. changes in the composition of the materials, or use of new materials, that would result in an increase in emissions of any toxic air contaminant listed in OAC rule 3745-114-01, that was modeled from the initial (or last) application; and
  - c. physical changes to the emissions unit(s) or its/their exhaust parameters (e.g., increased/ decreased exhaust flow, changes in stack height, changes in stack diameter, etc.).

If the permittee determines that the "Toxic Air Contaminant Statute" will be satisfied for the above changes, the Ohio EPA will not consider the change(s) to be a "modification" under OAC rule 3745-31-01 solely due to a non-restrictive change to a parameter or process operation, where compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F), has been documented. If the change(s) meet(s) the definition of a "modification", the permittee shall apply for and obtain a final PTIO prior to the change. The Director may consider any significant departure from the operations of the emissions unit, described in the permit application, as a modification that results in greater emissions than the emissions rate modeled to determine the ground level concentration; and he/she may require the permittee to submit a permit application for the increased emissions.

- (3) The permittee shall collect, record, and retain the following information for each toxic evaluation conducted to determine compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F):
- a. a description of the parameters/values used in each compliance demonstration and the parameters or values changed for any re-evaluation of the toxic(s) modeled (the composition of materials, new toxic contaminants emitted, change in stack/exhaust parameters, etc.);
  - b. the Maximum Acceptable Ground-Level Concentration (MAGLC) for each significant toxic contaminant or worst-case contaminant, calculated in accordance with the "Toxic Air Contaminant Statute", ORC 3704.03(F);
  - c. a copy of the computer model run(s), that established the predicted 1-hour maximum ground-level concentration that demonstrated the emissions unit(s) to be in compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F), initially and for each change that requires re-evaluation of the toxic air contaminant emissions; and



- d. the documentation of the initial evaluation of compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F), and documentation of any determination that was conducted to re-evaluate compliance due to a change made to the emissions unit(s) or the materials applied.
- (4) The permittee shall maintain a record of any change made to a parameter or value used in the dispersion model, used to demonstrate compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F), through the predicted 1-hour maximum ground-level concentration. The record shall include the date and reason(s) for the change and if the change would increase the ground-level concentration.
- b) Reporting Requirements

Emission units P001 and P004 are subject to the following reporting requirements:

- (1) The permittee shall include any changes made to a parameter or value used in the dispersion model, that was used to demonstrate compliance with the Toxic Air Contaminant Statute, ORC 3704.03(F), through the predicted 1-hour maximum ground-level concentration, in the annual Permit Evaluation Report (PER). If no changes to the emissions, emissions unit(s), or the exhaust stack have been made, then the report shall include a statement to this effect.



**Final Permit-to-Install and Operate**  
Antero Resources - Wayne Pad  
**Permit Number:** P0114893  
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**Effective Date:** 7/22/2013

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



**1. Emissions Unit: Dehydration System, P001**

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

P001	One glycol dehydration unit includes glycol dehydration unit Reboiler and gas-condensate-glycol (GCG) separator (flash separator) vented to a BTEX Elimination System with a condenser and/or a dehydrator system flare (1MMBtu/hr). P001 to be in operation during the high volume operation period only.
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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	<p>Emissions of Volatile Organic Compounds (VOC) (reboiler plus regenerator) (excludes methane and ethane) shall not exceed 7.51 tons/year.</p> <p>Use of a dehydration system flash separator that captures flash vapors.</p> <p>Use of a flare and/or BTEX elimination system with condenser controlling the dehydration still vent as needed to comply with the 7.51 tons VOC/year emission limit.</p>



	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		The requirements of this rule include compliance with any applicable requirements of 40 CFR Part 63 Subpart HH.  See b)(2)a.
b.	OAC rule 3745-31-05(A)(3)(b) OAC rule 3745-31-05(C), as effective 12/1/06	See b)(2)b.
c.	Part 63, Subpart HH, National Emission Standards for hazardous air pollutants (NESHAP) from Oil and Natural Gas Production Facilities	Compliance with the applicable portions of 40 CFR Part 63, Subpart HH. Any final amendments to this rule will supersede any previous Subpart HH requirement(s) in this permit.
d.	40 CFR 60.18(c)(1) 40 CFR 63.11(b)(4)	No visible emissions except for 5 minutes during any 2 consecutive hours.

(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 BAT no longer applies.
- 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:
  - i. This permit takes into account the following voluntary restrictions (including the use of any applicable air pollution control equipment) for the purpose of avoiding Best Available Technology (BAT) requirements for VOC under OAC rule 3745-31-05(A)(3):
    - (a) Emissions of Volatile Organic Compounds (VOC) (excludes methane and ethane) shall not exceed 7.51 tons/year;
    - (b) Use of a dehydration system flash separator that captures flash vapors; and





- (2) The annual facility natural gas or hydrocarbon liquid throughput for each year as per 40 CFR 63.760(a).
- (3) The actual annual average flow rate of natural gas to the glycol dehydration unit; the actual annual average emissions of benzene; and shall identify the method used to demonstrate compliance.
- (4) With respect to the condenser (BTEX elimination system) which is used to control the dehydration still vent, a report describing all periods of time when the continuous temperature monitoring device that continuously monitors and records the condenser vapor outlet temperature is not working and process gas is being vented to the condenser.
- (5) The reports required by this permit may be submitted through the Ohio EPA's eBusiness Center: Air Services online web portal; or they may be mailed as a hard copy to the appropriate district office or local air agency.
- (6) This facility shall submit an annual Permit Evaluation Report (PER) to the Ohio EPA District Office or Local Air Agency 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

Compliance with the Emission Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:

(1) Emissions Limitation:

VOC emissions (Reboiler plus regenerator) shall not exceed 7.51 tons per year.

Applicable Compliance Method:

Reboiler:

The emissions limitation for VOC is based on the AP-42 emission factor of 0.0054lbVOC/MMBtu Table 1.4-2, "Emission Factors for Criteria Pollutants and Greenhouse Gases." and using the estimated burner rating of 1 MMBtu/hr. Estimated VOC emissions from the reboiler shall be determined by the following calculation:

$$0.0054\text{lb VOC/MMBtu} \times 1.0 \text{ MMBtu/hr} = 0.0054 \text{ lb VOC/hr}$$

$$0.0054\text{lb VOC/hr} \times 8760\text{hr/yr} \times 1 \text{ ton}/2000 \text{ lbs} = 0.02365 \text{ tons VOC/year.}$$

Regenerator:

The emissions limitation for the regenerator VOC is based on results from the GRI GlyCalc (from the permittee's application) of 1.49 lb VOC/hr. Estimated VOC emissions from the regenerator shall be determined by the following calculation:

$$1.71 \text{ lb VOC/hr} \times 8760 \text{ hr/year} \times 1 \text{ ton}/2000 \text{ lbs} = 7.4898 \text{ tons VOC/year.}$$



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Reboiler + Regenerator = 0.023652 tons VOC/year + 7.4898 tons VOC/year = 7.51 tons VOC/year.

(2) Emissions 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.

g) Miscellaneous Requirements

(1) None.



**2. Emissions Unit: Flare/Combustor, P004**

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

P004	High Volume Operation: Total Flares/Combustors with a maximum capacity heat input of no more than 315.9 MMBtu/hr. Low Volume Operation: Total Flares/Combustors with a maximum capacity heat input of no more than 1.8 MMBtu/hr .
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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)	Carbon Monoxide (CO) emissions shall not exceed 0.824 lb/MMBtu.  Nitrogen Oxide (NOx) emissions shall not exceed 0.0980 lb/MMBtu.



b.	OAC rule 3745-31-05(A)(3), as effective 11/30/01	<p>Volatile Organic Compound (VOC) emissions shall not exceed 0.0054 lb/MMBtu.</p> <p>VOC emissions shall not exceed 2.48 tons/year.</p> <p>Sulfur Dioxide (SO<sub>2</sub>) emissions shall not exceed 0.0006 lb/MMBtu.</p> <p>SO<sub>2</sub> emissions shall not exceed 0.27 tons/year.</p> <p>Particulate Emissions (PE) shall not exceed 3.43 tons/year.</p> <p>PE emissions shall not exceed 0.0075 lb/MMBtu</p> <p>See b)(2)a.</p>
c.	OAC rule 3745-31-05(A)(3)(b), as effective 12/01/06	See b)(2)b.
d.	Part 63, Subpart HH, National Emission Standards for hazardous air pollutants (NESHAP) from Oil and Natural Gas Production Facilities	Compliance with the applicable portions of 40 CFR Part 63, Subpart HH. Any final amendments to this rule will supersede any previous Subpart HH requirement(s) in this permit.

(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 emissions limitations/control measures no longer apply.
- b. This rule applies 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, VOC, and SO<sub>2</sub> emissions from this air



contaminant source since the uncontrolled potential to emit for PE, VOC, and SO<sub>2</sub> are less than ten tons per year.

c) Operational Restrictions

- (1) This facility must comply with all applicable operational restrictions found in 40 CFR Part 63, Subpart HH.
- (2) The flare shall be operated with a flame present at all times when gases are vented to it.
- (3) An automatic flame ignition system shall be installed.
- (4) If using a pilot flame ignition system, the presence of a pilot flame shall be monitored using a thermocouple or other equivalent device to detect the presence of a flame. A pilot flame shall be maintained at all times in the flare's pilot light burner. If the pilot flame goes out and does not relight, then an alarm shall sound.
- (5) If using an electric arc ignition system, the arcing of the electric arc ignition system shall pulse continually and a device shall be installed and used to continuously monitor the electric arc ignition system.
- (6) Any flare, auto ignition system, and recorder shall be installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and operating manuals.

d) Monitoring and/or Recordkeeping Requirements

- (1) This facility must comply with all applicable monitoring and/or recordkeeping requirements found in 40 CFR Part 63, Subpart HH.
- (2) The permittee shall:
  - a. Continuously monitor and record the presents of the flame;
  - b. Record all periods during which the automatic flare ignition system (pilot flame or electronic arc ignition system) was not working; and
  - c. Record all periods during which there was gas being vented to the flare but the flare was not lit.
- (3) The permittee shall maintain a record of the total amount of gas combusted in this emissions unit for the calendar year.

e) Reporting Requirements

- (1) This facility must comply with all applicable reporting requirements found in 40 CFR Part 63, Subpart HH.
- (2) As part of the annual Permit Evaluation Report (PER), this facility shall submit a report describing all periods of time when the pilot flame or electronic arc ignition system is not



working and process gas is being vented to it. The reports shall include the date, time, and duration of each such period.

- (3) As part of the annual Permit Evaluation Report (PER), this permittee shall submit a report summarizing the total amount of gas combusted in this emissions unit for the calendar year.
- (4) The permittee shall submit an annual Permit Evaluation Report (PER) to the Ohio EPA District Office or Local Air Agency 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. It is recommended that the PER is submitted electronically through the Ohio EPA's "e-Business Center: Air Services" although PERs can be submitted via U.S. postal service or can be hand delivered.

f) Testing Requirements

Compliance with the Emission Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:

a. Emissions Limitation:

CO emissions shall not exceed 0.0824 lb/MMBtu.

Applicable Compliance Method:

**Initial emissions testing:**

CO emissions shall be determined within 3 weeks of beginning of production operations. Stack testing shall be performed over a three day period; each day will consist of a three hour test run. The permittee must submit proposed test methodology via a complete Intent to Test form to Ohio EPA, Southeast District Office at least two weeks prior to the proposed test. Ohio EPA, Southeast District Office will review the proposed methodology to determine if it is acceptable. The stack test report shall be submitted to the Ohio EPA, Southeast District Office within one week after the test is complete. If the emission factor developed during the stack test shows the source would be classified as a "Major Stationary Source", as defined in OAC rule 3745-31-01, taking into account the potential gas flow rate as submitted in permittee's application, the well shall be "shut in" within 48 hours. (This item is negotiable if Antero can provide valid safety reasons for extending the operation of the flare prior to discontinuing operation.)

If required, ongoing compliance shall be determined based on USEPA-approved test methods.

b. Emissions Limitations:

VOC emissions shall not exceed 0.0054 lb/MMBtu.

VOC emissions shall not exceed 2.48 tons/year.



Applicable Compliance Method:

The lb/MMBtu emissions limitation for VOC is based on the AP-42 emission factor of 0.0054 lb VOC/MMBtu Table 1.4-2, "Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion."

Compliance with the annual limitation will be determined by multiplying 0.0054 lb/MMBtu by the total amount of gas combusted in the emissions unit as recorded in d)(2)(3) by 8,760 hrs and divided by 2,000 lb.

c. Emissions Limitation:

NO<sub>x</sub> emissions shall not exceed 0.0980 lb/MMBtu.

Applicable Compliance Method:

The lb/MMBtu emissions limitation for NO<sub>x</sub> is based on the AP-42 emission factor of 0.0980 lb NO<sub>x</sub>/MMBtu Table 1.4-1, "Emission Factors for Nitrogen Oxides (NO<sub>x</sub>) and Carbon Monoxide (CO) from Natural Gas Combustion."

If required, nitrogen oxides emissions shall be determined according to test Methods 1 - 4, and 7 as set forth in the "Appendix on Test Methods" in 40 CFR, Part 60 "Standards of Performance for New Stationary Sources". Alternative U.S. EPA-approved test methods may be used with prior approval from Ohio EPA, Southeast District Office.

d. Emissions Limitations:

PE shall not exceed 0.0075 lb/MMBtu.

PE shall not exceed 3.43 tons/year.

Applicable Compliance Method:

The lb/MMBtu emissions limitation for PE is based on the AP-42 emission factor of 0.0075 lb PE/MMBtu Table 1.4-2, "Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion."

Compliance with the annual limitation will be determined by multiplying 0.0075 lb/MMBtu by the total amount of gas combusted in the emissions unit as recorded in d)(2)(3) by 8,760 hrs and divided by 2,000 lb.

If required, particulate emissions shall be determined according to test Methods 1 - 5, as set forth in the "Appendix on Test Methods" in 40 CFR, Part 60 "Standards of Performance for New Stationary Sources". Alternative U.S. EPA-approved test methods may be used with prior approval from Ohio EPA, Southeast District Office.

e. Emissions Limitation:

SO<sub>2</sub> emissions shall not exceed 0.0006 lb/MMBtu.



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SO<sub>2</sub> emissions shall not exceed 0.27 tons/year.

Applicable Compliance Method:

The lb/MMBtu emissions limitation for PE is based on the AP-42 emission factor of 0.0006 lb SO<sub>2</sub>/MMBtu Table 1.4-2, "Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion."

Compliance with the annual limitation will be determined by multiplying 0.0006 lb/MMBtu by the total amount of gas combusted in the emissions unit as recorded in d)(2)(3) by 8,760 hrs and divided by 2,000 lb.

If required, sulfur dioxide emissions shall be determined according to test Methods 1 - 4, and 6 as set forth in the "Appendix on Test Methods" in 40 CFR, Part 60 "Standards of Performance for New Stationary Sources" and the procedures specified in OAC rule 3745-17-03(B)(9). Alternative U.S. EPA-approved test methods may be used with prior approval from Ohio EPA, Southeast District Office.

g) Miscellaneous Requirements

(1) None.



**3. Emissions Unit Group: Equipment/Pipeline Leaks, F001**

F001	<p>Ancillary equipment and Associated equipment: compressors, pumps, piping, pneumatic controllers, gas-water/condensate/oil separators, etc.</p> <p>Equipment/pipeline leaks from valves, flanges, pressure relief devices, open end valves or lines, and pump and compressor seals in VOC or wet gas service.</p>
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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.	OAC rule 3745-31-05(A)(3), as effective 11/30/01	Emissions of Volatile Organic Compounds (VOC) shall not exceed 5.87 tons year. Fugitive leaks shall be repaired as soon as possible following detection. See b)(2)a. below
b.	OAC rule 3745-31-05(A)(3)(b), as effective 12/01/06	See b)(2)b. below

(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 ORC changes effective August 3, 2006 (S.B. 265 changes), such that BAT is no longer required by State regulation for NAAQS pollutant emissions 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 OAC rule 3745-31-05, then these emission limits/control measures no longer apply.

- b. This rule paragraph applies once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 as part of the SIP.

The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to VOC emission from this air contaminant source since the uncontrolled potential to emit for VOC is less than 10 tons/yr.

- c) Operational Restrictions

- (1) None.

- d) Monitoring and/or Recordkeeping Requirements

- (1) Leak Detection and Repair Program

- a. The permittee shall develop and implement a leak detection and repair program designed to monitor and repair leaks from ancillary equipment and compressors covered by this permit. This leak detection and repair program shall include the following elements:

- i. An initial and then annual inspection of the ancillary and associated equipment and compressors shall be conducted to determine if a leak exists. Leaks shall be determined through the use of an analyzer meeting U.S. EPA Method 21, 40 CFR Part 60, Appendix A.

- ii. The analyzer shall be operated and maintained following the instrument manufacturer's operation and maintenance instructions.

- iii. A leak shall be determined if the instrument reading is equal to or greater than 10,000 ppm total VOC or the "leak detected" instrument reading required per any applicable rule.

- iv. Documentation that includes the following:

- (a) The date the inspection was conducted;

- (b) The name of the employee conducting the leak check;

- (c) The identification of any component that was determined to be leaking; and



(d) The date the component was repaired and determined to no longer be leaking.

b. The records associated with the leak detection and repair program 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

- (1) The reports required by this permit may be submitted through the Ohio EPA's eBusiness Center: Air Services online web portal; or they may be mailed as a hard copy to the appropriate district office or local air agency.
- (2) This facility shall submit an annual Permit Evaluation Report (PER) to the Ohio EPA District Office or Local Air Agency 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

Compliance with the Emission Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:

(1) Emissions Limitation:

Emissions of VOC shall not exceed 5.87 tons per year from fugitive equipment leaks.

Applicable Compliance Method:

The annual VOC limitation is the estimated potential-to-emit based upon the maximum number of components and type of service (gas/vapor and light liquid) expected at the natural gas production site. The appropriate emissions factors from U.S. EPA's "Protocol for Equipment Leak Emission Estimates", Table 2-4, for Oil and Gas production Operations (a conservative estimate), shall be used to demonstrate compliance with the 5.87 tons/year limit. The facility's potential emissions from ancillary and associated equipment shall be documented from the summation of the following calculations:

Component Type # of components x emission factor x % VOC\* = lb VOC/hr

In Gas/Vapor Service

785 (Number of connectors) x 0.000441 lb/hr x 50% VOC = 0.1730629 lb VOC/hr

90 (Number of valves) x 0.00992 lb/hr x 50% VOC = 0.4464360 lb VOC/hr

75 (Number of flanges) x 0.00086 lb/hr x 50% VOC = 0.0322426 lb VOC/hr

(Number of compressor seals) x 0.01940 lb/hr x 50% VOC = 0.0744060 lb VOC/hr

15 (Number of relief valves) x 0.01940 lb/hr x 50% VOC = 0.1940068 lb VOC/hr



20 (Number of high bleed pneumatic controllers) x 0.0194 lb/hr x 50% VOC  
=0.9201544lb VOC/hr

In Light Liquid Service

250 (Number of connectors) x 0.000463 lb/hr x 100% VOC = 0.1157427lb VOC/hr

40 (Number of valves) x 0.00551 lb/hr x 100% VOC = 0.22046226 lb VOC/hr

10 (Number of flanges) x 0.00024 lb/hr x 100% VOC = 0.0024300 lb VOC/hr

0 (Number of pump seals) x 0.0287 lb/hr x 100% VOC = 0 lb VOC/hr

15 (Number of relief valves) x 0.01653 lb/hr x 100% VOC = 0.247950 lb VOC/hr

5 (Number of high bleed pneumatic controllers) x 0.01653 lb/hr x 100% VOC =  
0.4213083 lb VOC/hr

Total Fugitive Leak Emissions

VOC's from In Gas Vapor service emissions + VOC's from In Light Liquid Service  
emissions = 0.9201544 lb VOC/hr + 0.4213083 lb VOC/hr = 1.34 lb VOC/hr

1.34 lb VOC/hr X 8760 hr/yr / 2000 lb/yr= 5.87 tons/year

As an alternative to using the above emission factors to calculate VOC emissions, the  
facility may use facility specific VOC information for site specific emission factors.

g) Miscellaneous Requirements

(1) None.



**4. Emissions Unit: Unpaved Roadways and Parking Areas: F002**

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

F002	Unpaved roadways and parking areas, with a maximum of 17,924 vehicle miles traveled per year.
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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 operations(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. 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	<p>Fugitive particulate emissions (PE) shall not exceed 8.14 tons per year.</p> <p>There shall be no visible PE from unpaved roadways and parking areas except for a period of time not to exceed three minutes during any 60-minute observation period.</p> <p>Best available control measures that are sufficient to minimize or eliminate visible PE of fugitive dust.</p> <p>See b)(2)a. through h. below.</p>



	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
b.	OAC rule 3745-31-05(C), as effective 12/01/06	See b)(2)i. below.
c.	OAC rule 3745-17-07(B)	See b)(2)j. below.
d.	OAC rule 3745-17-08(B)	See b)(2)k. below.

(2) Additional Terms and Conditions

- a. The following unpaved parking roadways and parking areas are covered by this permit and subject to the requirements of OAC rule 3745-31-05(A)(3):
  - Haul and access road
  - Parking areas
- b. 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 watering at sufficient treatment frequencies to ensure compliance. Nothing in this paragraph shall prohibit the permittee from employing other control measures to ensure compliance.
- c. 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.
- d. 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.
- e. Any unpaved roadway or parking area that takes the characteristics of a paved roadway or parking area due to the application of certain types of dust suppressants shall remain subject to the visible emission limitation for unpaved roadways and parking areas. Any unpaved roadway or parking area that is paved shall be subject to the visible emission limitation for paved roadways and parking areas of no visible PE except for a period of time not to exceed one minute during any sixty-minute observation period.



- f. 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.
- g. 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.
- h. 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 regulation for NAAQS pollutant emissions 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 OAC rule 3745-31-05, then these emission limits/control measures no longer apply.
- i. This rule paragraph applies once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 as part of the SIP.

Permit to Install and Operate P0114893 for this air contaminant source takes into account the following voluntary restriction (including the use of any applicable air pollution control equipment) as proposed by the permittee for the purpose of avoiding Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3):

- i. watering of unpaved roadways sufficient to achieve a control efficiency of 90%; and
- ii. fugitive PE shall not exceed 8.14 tons per year.
- j. This emissions unit is exempt from the visible emissions limitations for fugitive dust, specified in OAC rule 3745-17-07(B), pursuant to OAC rule 3745-17-07(B)(11)(e), because the emissions unit is not located within areas identified in "Appendix A" of OAC rule 3745-17-08.
- k. This emissions unit is not located within areas identified in "Appendix A" of OAC rule 3745-17-08, therefore, the requirements of OAC rule 3745-17-08(B), which requires the installation of reasonably available control measures to prevent fugitive dust, do not apply to this emissions unit pursuant to OAC rule 3745-17-08(A)(1).

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

- (2) 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 shall be performed as soon as such event(s) has (have) ended, except if the next required inspection is within one week.
- (3) The permittee shall maintain records of the following information:
- a. 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;
  - b. the date of each inspection where it was determined by the permittee that it was necessary to implement the control measures;
  - c. the dates the control measures were implemented; and
  - d. 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)(3)d. shall be updated on a calendar quarter basis within 30 days after the end of each calendar quarter.

e) Reporting Requirements

- (1) The reports required by this permit may be submitted through the Ohio EPA's eBusiness Center: Air Services online web portal; or they may be mailed as a hard copy to the appropriate district office or local air agency.
- (2) 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 in Term b)(1) shall be determined in accordance with the following methods:

a. Emissions Limitation:

Fugitive PE shall not exceed 8.14 tons per year.

Applicable Compliance Method:

Compliance with annual emissions limitations shall be determined based on the emission factor calculations for unpaved roadways and parking areas in AP-42 section 13.2.2, (11/06). Initial compliance has been determined utilizing inputs provided by the permittee in their application as follows:

$$EF = ((k \times (s/12)^a \times (W/3)^b) \times ((365-p)/365))$$

Where:

EF = size-specific emission factor (lb/VMT)

k (lb/VMT) = 4.9

a = 0.7

b = 0.45

s = % surface material silt content = 8.5

W = mean vehicle weight (tons) = 59.24816

p = number of rain days per year >0.01 in. = 140

Therefore, EF = 9.08346lb/VMT

Maximum travel = 17,924 VMT/year

$$(17,924 \text{ VMT/year})(9.08346\text{lb/VMT})(1 \text{ ton}/2,000 \text{ lbs}) = 99.27 \text{ TPY uncontrolled PE}$$

Assume 90% control efficiency for roadway watering

$$(81.405)(1-0.90) = 8.14 \text{ TPY controlled PE}$$

b. Emissions Limitation:

There shall be no visible PE from unpaved roadways and parking areas except for a period of time not to exceed three minutes during any 60-minute observation period.

Applicable Compliance Method:

If required, visible emissions of fugitive dust shall be determined according to USEPA Method 22, with the modifications found in OAC rule 3745-17-03(B)(4).



**Final Permit-to-Install and Operate**

Antero Resources - Wayne Pad

**Permit Number:** P0114893

**Facility ID:** 0661005014

**Effective Date:** 7/22/2013

g) Miscellaneous Requirements

(1) None.



**5. Emissions Unit: Flash Vessel/Storage Tanks and truck loading for water and/or petroleum liquids: T001**

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

T001	13 condensate tanks and 2 produced water tanks; each tank is a fixed roof tank with a capacity of 16,800-gallons (42 barrels) controlled by flare with 95% control efficiency. Truck loading submerged or bottom filled and controlled by 95% efficient vapor balance system.
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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	VOC emissions from breathing losses, tank working losses, flash losses from all tanks combined at the site and truck loading losses shall not exceed 3.26tons per year.  Use of flare to control working, breathing, and flash losses. The flare must meet the requirements for P004 listed in Section C.2. of this permit.  Use of vapor balance while loading trucks.



	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		Use of submerged or bottom fill on all tanks.
b.	OAC Rule 3745-31-05 (C)	See b)(2)b.
c.	40 CFR Part 60 Subpart Kb	See b)(2)c.
d.	OAC Rule 3745-21-09(L)(2)(b)	See b)(2)d.

(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 emissions limitations/control measures no longer apply.

b. This rule paragraph applies once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 as part of the SIP.

P0114893 for this air contaminant source takes into account the following voluntary restriction (including the use of any applicable air pollution control equipment) as proposed by the permittee for the purpose of avoiding Best Available Technology (BAT) requirements for VOC under OAC rule 3745-31-05(A)(3):

- i. All working, breathing and flash losses shall be controlled by facility flare emissions unit (F004) with a control efficiency of 95%.
- ii. Use of vapor balance while loading trucks.
- iii. Use of submerged or bottom fill on all tanks.
- iv. VOC emissions shall not exceed 3.26 TPY.

c. This emission unit is exempt from the control requirements of 40 CFR 60.110(b) because it is a vessel with a design capacity less than or equal to 1,589.874



m<sup>3</sup>used for petroleum or condensate stored, processed, or treated prior to custody transfer.

- d. 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) None.

d) Monitoring and/or Recordkeeping Requirements

- (1) The permittee shall record the annual throughput, in gallons per year. The permittee shall keep records of U.S. EPA TANKS software program and/or other process simulation program calculations used to demonstrate annual storage tank and process vent emissions based. 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.
- (2) The permittee shall maintain a record of the data and calculations of the loading loss factors referenced in paragraph f)(1).

e) Reporting Requirements

- (1) The permittee shall submit an annual Permit Evaluation Report (PER) to the Ohio EPA District Office or Local Air Agency 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. It is recommended that the PER is submitted electronically through the Ohio EPA's "e-Business Center: Air Services" although PERs can be submitted via U.S. postal service or can be hand delivered.

f) Testing Requirements

Compliance with the Emission Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:

a. Emissions Limitation:

VOC emissions shall not exceed 3.26 tons of VOC per year.

Applicable Compliance Method:

**Working and breathing loss:**

Annual emissions of breathing losses and working losses from all storage tanks shall be calculated using the total petroleum liquid throughput for the 12-month period reported based on the use of a current version of the U.S. EPA's TANKS software program for storage tank working/breathing losses and either the



TANKS software program or other process simulation programs such as, but not limited to, HYSYS or ProMax, to calculate VOC flash losses. The storage tank emissions are controlled by a control device P004, therefore the potential working, breathing and working emissions may be calculated by applying a 95% combustion efficiency as follows:

$$10.67 \text{ tons/year} \times [(1-95)/100] = 0.53 \text{ tons/year}$$

Where:

$$10.67 \text{ tons/year} = \text{uncontrolled VOC emissions as calculated from TANKS}$$

**Truck loading loss:**

Truck loading emissions shall be based on multiplying a loading loss factor (Condensate loading loss + produced water loading loss) by the annual liquid throughput in gallons per year divided by 1000.

The loading loss factor was derived using AP-42, Section 5.2, "Loading Loss Equation" and applying the control efficiency of the return line. The loading loss shall be determined by the following calculation:

**Emissions from Condensate:**

$$\text{Condensate loading loss} = 12.46 \text{ SPM/T} [1 - \text{Eff}/100]$$

$$\text{Condensate loading loss} = 12.46 \times 0.6 \times 7.83 \text{ psia} \times 60 \text{ lb/lb mole} / 511.3^\circ\text{R} \\ [1-95/100] = 0.34 \text{ lb/1000 gal of liquid loaded}$$

$$\text{Annual condensate emissions rate} = \text{Condensate loading loss} \times \text{Condensate throughput at well} \\ = 0.34 \text{ lb/1000gal} \times 91,980,000 \text{ gal}^{**} = 5,264.71 \text{ lb/yr}$$

**Emissions from Produced Water:**

$$\text{Produced water loading loss} = 12.46 \text{ SPM/T} [1 - \text{Eff}/100]$$

$$\text{Produced water loading loss} = 12.46 \times 0.6 \times 0.24 \text{ psia} \times 18.02 \text{ lb/lb mole} \times 511 \\ ^\circ\text{R} [1-95/100] = 0.003123 \text{ lb/1000 gal of liquid loaded} = 0.003123 \text{ lb/1,000 gal}$$

$$\text{Annual produced water emissions rate} = \text{Produced water loading loss} \times$$

$$\text{Produced water throughput at well} = 0.003123 \text{ lb/1000gal} \times 64,123,200 \text{ gal}^{**} \\ = 200.27 \text{ lb/yr}$$

**Total Truck loading loss**

$$\text{Truck loading loss} = \text{Condensate loading loss} + \text{produced water loading loss} \\ = 5,264.71 \text{ lb/yr} + 200.26 \text{ lb/yr} = 5,464.97 \text{ lb/yr} = 2.73 \text{ tons/yr}$$

Where:

$$\text{Eff} = 100\% \times 95\% = 95\% \text{ (capture efficiency of return line) }^{**}$$

$$S = \text{saturation factor, 0.6 for submerged fill (AP-42 Chapter 5.2-1)}$$



**Final Permit-to-Install and Operate**

Antero Resources - Wayne Pad

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P = vapor pressure of liquid loaded \*

M = molecular weight of vapor \*

T = temperature of bulk liquid \*

\* from TANKS summary

\*\* from permittee's application

**Total VOC loss:**

Total VOC loss = working breathing loss after control + truck loading loss  
= 0.53 tons/year + 2.73 tons/year = 3.26 tons/year

g) Miscellaneous Requirements

(1) None