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west virginia department of environmental protection

## G70-C GENERAL PERMIT ENGINEERING EVALUATION

PREVENTION AND CONTROL OF AIR POLLUTION IN REGARD TO THE CONSTRUCTION, MODIFICATION,  
RELOCATION, ADMINISTRATIVE UPDATE AND OPERATION OF NATURAL GAS PRODUCTION FACILITIES  
LOCATED AT THE WELL SITE

APPLICATION NO.: G70-C130C

FACILITY ID: 017-00144

CONSTRUCTION  
 MODIFICATION  
 RELOCATION

CLASS I ADMINISTRATIVE UPDATE  
 CLASS II ADMINISTRATIVE UPDATE

### BACKGROUND INFORMATION

Name of Applicant (as registered with the WV Secretary of State's Office): Antero Resources Corporation

Federal Employer ID No. (FEIN): 80-0162034

Applicant's Mailing Address: 1615 Wynkoop Street

City: Denver

State: CO

ZIP Code: 80202

Facility Name: James Webb Wellpad

Operating Site Physical Address: 416 Cabin Run Road  
If none available, list road, city or town and zip of facility.

City: Near West Union

Zip Code: 26456

County: Doddridge

Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):

Latitude: 39.23871

Longitude: -80.87306

SIC Code: 1311  
NAICS Code: 211111

Date Application Received:  
August 3, 2016

Fee Amount: \$1,500

Date Fee Received: August 8, 2016

Applicant Ad Date: August 5, 2016

Newspaper: *The Doddridge Independent*

Date Application Complete: August 31, 2016

Due Date of Final Action: October 15, 2016

Engineer Assigned: David Keatley

Description of Permitting Action: Installation and operation of five (5) 68-bhp vapor recovery unit (VRU) compressor engines and two (2) 99-bhp VRU compressor engine, and increase in condensate throughput.

## PROCESS DESCRIPTION

Raw natural gas from nine (9) natural gas wells go to nine (9) 2.0-mmBtu/hr line heater (LH001 through LH009). The line heaters are the first step in heating the natural gas to encourage separation. The heated raw natural gas from the line heaters is heated by nine (9) 1.5-mmBtu/hr gas production units (GPUs) GPU001 through GPU009. The gas from the GPUs exit the facility via pipeline. The produced water goes to two (2) 400-bbl produced water tanks (TANKPW001-002). The condensate from the GPUs goes to low-pressure separators. The gas from the low-pressure separators goes to five (5) compressors. The five (5) compressors are powered by four-stroke rich-burn Ford MSG-425 68-bhp natural gas fired VRU compression engines (ENG001 through ENG005) utilizing NSCR. The condensate from the low-pressure separators go to vapor recovery towers. The condensate from the vapor recovery towers is sent to ten (10) 400-bbl condensate tanks (TANKCOND001-010). The vapors from the vapor recovery towers go to two (2) compressors which then go to the five (5) compressors. The two (2) compressors are powered by four-stroke rich-burn CSG-637 99-bhp natural gas fired VRU compressor engines (ENG006 through ENG007) utilizing NSCR. The working, breathing, and flash vapors from the produced water and condensate will be controlled by three (3) 12-mmBtu/hr enclosed combustors (EC001 through EC003). Condensate will be loaded into trucks and taken off site at a maximum rate of 42,893,340 gallons/year. Produced water will be loaded into trucks and taken off site at a maximum rate of 7,205,100 gallons/year.

## SITE INSPECTION

Site Inspection Date: May 3, 2016

Site Inspection Conducted By: James Robertson

Results of Site Inspection: The facility was deemed in compliance.

Did Applicant meet Siting Requirements? Yes

If applicable, was siting criteria waiver submitted? N/A

Directions to Facility: Travel on US 50 for approximately 28.4 miles. Travel left onto Old US 50 E/Sunnyside Road (CR 50/30). Travel on CR 50/30 for approximately 1.9 miles and turn left onto Oxford Rd (CR 21). Travel on CR 21 for approximately 2.0 miles. Turn right onto Cabin Run (CR 21/1). Travel on CR 21/1 for approximately 0.5 miles and the access road to the facility is on the right.

Overhead Google Earth Image of Facility:



## ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Calculation methodology for emission units:

Emission Unit ID#	Process Equipment	Calculation Methodology (e.g. ProMax, GlyCalc, mfg. data, AP-42, etc.)
TANKCOND-001 through TANKCOND-010	Condensate Tanks	ProMax
TANKPW-001 and TANKPW-002	Produced Water Tanks	ProMax
L001	Condensate Truck Loading	AP-42 equation
L002	Produced Water Truck Loading	AP-42 equation
E003	Enclosed Combustor	AP-42
ENG001 through ENG005	Compressor Engines	mfg data and AP-42
ENG006 and ENG007	Compressor Engines	mfg data and AP-42
GPU001 through GPU009	Gas Production Units	AP-42
LH001 through LH009	Line Heaters	AP-42
E001	Enclosed Combustor	AP-42
E002	Enclosed Combustor	AP-42

The total facility PTE for the facility (including fugitive emissions) is shown in the following table:

Pollutant	Facility Wide PTE (tons/year)
Nitrogen Oxides	14.49
Carbon Monoxide	23.46
Volatile Organic Compounds	26.30
Particulate Matter	1.15
Particulate Matter-10/2.5	1.12
Sulfur Dioxide	0.08
Formaldehyde	0.41
Benzene	0.05
Toluene	0.03
Ethylbenzene	0.01
Xylenes	0.02
n-Hexane	2.98
Total HAPs	3.50
Carbon Dioxide Equivalent	20,909

Estimated New/Modified Maximum Controlled PTE:

Emission Point ID	Emission Unit ID	Emission Source	Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (tpy)			
EP-EC001 through EP-EC003	TANKCOND001 through TANKCOND009, TANKPW001 through TANKPW002, and EC001 through EC003	Cimarron Enclosed Combustors  (Controlling: Produced Water Tanks, Condensate Tanks, and Enclosed Combustor combustion emissions)  Emissions per Each	Nitrogen Oxides	0.11	0.49			
			Carbon Monoxide	0.10	0.41			
			Total Particulate Matter	0.01	0.04			
			Volatile Organic Compounds	1.91	8.31			
			n-Hexane	0.22	0.93			
			Benzene	<0.01	0.01			
			Toluene	<0.01	0.01			
			Xylenes	<0.01	0.01			
			CO <sub>2e</sub>	394	1,724			
			EP-L001	L001	Condensate Truck Loading  42,893,340 gallons/year	Volatile Organic Compounds	12.40	26.38
						n-Hexane	0.46	2.04
						Xylenes	<0.01	0.01
						n-Hexane	0.11	0.23
CO <sub>2e</sub>	1	2						
EP-ENG001 through EP-ENG005	ENG001 through ENG005	Ford MSG-425 Engine  68 bhp	Nitrogen Oxides	0.06	0.25			
			Carbon Monoxide	0.37	1.62			
			Volatile Organic Compounds	0.02	0.08			
			Total Particulate Matter	<0.01	0.03			
			Formaldehyde	0.02	0.06			
CO <sub>2e</sub>	67	292						

EP-ENG006 and EP-ENG007	ENG006 and ENG007	Ford CSG-637 99 bhp	Nitrogen Oxides	0.07	0.29
			Carbon Monoxide	0.54	2.35
			Volatile Organic Compounds	0.03	0.10
			Total Particulate Matter	0.01	0.04
			Formaldehyde	0.02	0.07
			CO <sub>2e</sub>	90	395
			Volatile Organic Compounds	<0.01	<0.01
EP-L002	L002	Produced Water Truck Loading 7,205,100 gallons/year	CO <sub>2e</sub>	1	1

## REGULATORY APPLICABILITY

### 45CSR6 (To Prevent and Control Air Pollution from the Combustion of Refuse)

45CSR6 prohibits open burning, establishes emission limitations for particulate matter, and establishes opacity requirements. Sources subject to 45CSR6 include completion combustion devices, enclosed combustion devices, and flares.

The facility-wide requirements of the general permit include the open burning limitations §§45-6-3.1 and 3.2.

All completion combustion devices, enclosed combustion devices, and flares are subject to the particulate matter weight emission standard set forth in §45-6-4.1; the opacity requirements in §§45-6-4-3 and 4-4; the visible emission standard in §45-6-4.5; the odor standard in §45-6-4.6; and, the testing standard in §§45-6-7.1 and 7.2.

Enclosed combustion control devices and flares that are used to comply with emission standards of NSPS, Subpart OOOO are subject to design, operational, performance, recordkeeping and reporting requirements of the NSPS regulation that meet or exceed the requirements of 45CSR6.

Emission Unit ID#	Maximum Design Heat Input (MDHI) (MMBTU/hr)	Subject to Weight Emission Standard?	Control Efficiency Claimed by Registrant	Provide Justification how 45CSR6 is met.
EC001	12	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	98%	The emission standard for this enclosed combustor is 0.34 lb/hr and the estimated emissions is less than 0.01 lb/hr, so this standard should be met.
EC002	12	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	98%	The emission standard for this enclosed combustor is 0.34 lb/hr and the estimated emissions is less than 0.01 lb/hr, so this standard should be met.
EC003	12	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	98%	The emission standard for this enclosed combustor is 0.34 lb/hr and the estimated emissions is less than 0.01 lb/hr, so this standard should be met.

### 45CSR13 (Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation)

45CSR13 applies to this source due to the fact that the applicant is defined as a “stationary source” under 45CSR13 Section 2.24.b. *Stationary source* means, for the purpose of this rule, any building, structure, facility, installation, or emission unit or combination thereof, excluding any emission unit which meets or falls below the criteria delineated in Table 45-13B which: (a) is subject to any substantive requirement of an emission control rule promulgated by the Secretary; (b) discharges or has the potential to discharge more than six (6) pounds per hour and ten (10) tons per year, or has the potential to discharge more than 144 pounds per calendar day, of any regulated air pollutant; (c) discharges or has the potential to discharge more than two (2) pounds per hour or five (5) tons per year of hazardous air pollutants considered on an aggregated basis; (d) discharges or has the potential to discharge any air pollutant(s) listed in Table 45-13A in the amounts shown in Table 45-13A or greater; or, (e) an owner or operator voluntarily chooses to be subject to a construction or modification permit pursuant to this rule, even though not otherwise required to do so. 45CSR13 has an original effective date of June 1, 1974.

The applicant meets the definition of a stationary source because (check all that apply):

- Subject to a substantive requirement of an emission control rule promulgated by the Secretary.
- Discharges or has the potential to discharge more than six (6) pounds per hour and ten (10) tons per year, or has the potential to discharge more than 144 pounds per calendar day, of any regulated air pollutant.
- Discharges or has the potential to discharge more than two (2) pounds per hour or five (5) tons per year of hazardous air pollutants considered on an aggregated basis.
- Discharges or has the potential to discharge any air pollutant(s) listed in Table 45-13A in the amounts shown in Table 45-13A or greater.
- Voluntarily chooses to be subject to a construction or modification permit pursuant to this rule, even though not otherwise required to do so.

General Permit G70-C Registration satisfies the construction, modification, relocation and operating permit requirements of 45CSR13. General Permit G70-C sets forth reasonable conditions that enable eligible registrants to establish enforceable permit limits.

Section 5 of 45CSR13 provides the permit application and reporting requirements for construction of and modifications to stationary sources. No person shall cause, suffer, allow or permit the construction, modification, relocation and operation of any stationary source to be commenced without notifying the Secretary of such intent and obtaining a permit to construct, modify, relocate and operate the stationary source as required in the rule or any other applicable rule promulgated by the Secretary.

If applicable, the applicant meets the following (check all that apply):

- Relocation
- Modification
- Class I Administrative Update (45CSR13 Section 4.2.a)
- Class II Administrative Update (45CSR13 Section 4.2.b)

#### **45CSR16 (Standards of Performance for New Stationary Sources Pursuant to 40 CFR Part 60)**

45CSR16 applies to all registrants that are subject to any of the NSPS requirements described in more detail in the Federal Regulations section. Applicable requirements of NSPS, Subparts IIII, JJJJ and OOOO are included in General Permit G70-C.

The applicant is subject to:

- 40CFR60 Subpart IIII
- 40CFR60 Subpart JJJJ
- 40CFR60 Subpart OOOO

#### **45CSR22 (Air Quality Management Fee Program)**

45CSR22 is the program to collect fees for certificates to operate and for permits to construct or modify sources of air pollution. 45CSR22 applies to all registrants. The general permit fee of \$500 is defined in 45CSR13. In addition to the application fee, all applicants subject to NSPS requirements or NESHAP requirements shall pay additional fees of \$1,000 and \$2,500, respectively.

Registrants are also required to obtain and have in effect a valid certificate to operate in accordance with 45CSR22 §4.1. The fee group for General Permit G70-C is 9M (all other sources) with an annual operating fee of \$200.

**40CFR60 Subpart JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines)**

Subpart JJJJ sets forth nitrogen oxides (NOx), carbon monoxide (CO), and volatile organic compound (VOC) emission limits, fuel requirements, installation requirements, and monitoring requirements based on the year of installation of the subject internal combustion engine. The provisions for stationary spark ignition (SI) internal combustion engines for owners or operators of this Subpart have been included in General Permit G70-C, Section 13.

Emission Unit ID#	Engine Description (Make, Model)	Engine Size (HP)	Date of Manufacture	Provide Justification how 40CFR60 Subpart JJJJ is met.
ENG001 through ENG005	Ford MSG-425	68 bhp	2015	<input type="checkbox"/> Met Emission Standard <input checked="" type="checkbox"/> Certified Engine
ENG006 and ENG007	Ford CSG-637	99 bhp	2015	<input type="checkbox"/> Met Emission Standard <input checked="" type="checkbox"/> Certified Engine

**40CFR60, Subpart OOOO (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution)**

EPA published its New Source Performance Standards (NSPS) and air toxics rules for the oil and gas sector on August 16, 2012. EPA published final amendments to the Subpart on September 23, 2013.

40CFR60 Subpart OOOO establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO<sub>2</sub>) emissions from affected facilities that commence construction, modification or reconstruction after August 23, 2011. The affected sources which commence construction, modification or reconstruction after August 23, 2011 are subject to the applicable provisions of this Subpart as described below:

**Gas well affected facilities are included in General Permit G70-C in Section 5.0.**

Are there any applicable gas well affected facilities?  Yes  No

If Yes, list.

API number(s) for each Gas Well at this facility	Date the Gas Well was drilled or re-fractured
47017067030000	Proposed Date: February 1, 2017
47017067040000	Proposed Date: February 1, 2017
47017067080000	Proposed Date: February 1, 2017
47017067490000	Proposed Date: February 1, 2017
47017067050000	Proposed Date: February 1, 2017
47017067020000	Proposed Date: February 1, 2017
47017066990000	Proposed Date: February 1, 2017
47016067000000	Proposed Date: February 1, 2017
47017067010000	Proposed Date: February 1, 2017

**Pneumatic controllers affected facilities are included in General Permit G70-C, Section 10.0.**

Are there any applicable pneumatic controller affected facilities?  Yes  No

For the natural gas production segment (between the wellhead and the point of custody transfer to the natural gas transmission and storage segment and not including natural gas processing plants), each pneumatic controller

affected facility, which is a single continuous bleed natural gas-driven pneumatic controller operating at a natural gas bleed rate greater than 6 scfh.

**Requirements for storage vessel affected facilities are included in General Permit G70-C, Section 7.0.**

**Determination of storage vessel affected facility status is included in Section 6.0 of General Permit G70-C.**

Are there any applicable storage vessel affected facilities?  Yes  No

If No, list any emission reduction devices and control efficiencies used to avoid 40CFR60 Subpart OOOO.

Enclosed combustors EC001 through EC003 will control vapors from the storage vessels with a minimum control efficiency of 98%

Each storage vessel affected facility, which is a single storage vessel located in the oil and natural gas production segment, natural gas processing segment or natural gas transmission and storage segment, and has the potential for VOC emissions equal to or greater than 6 tpy as determined according to this section by October 15, 2013 for Group 1 storage vessels and by April 15, 2014, or 30 days after startup (whichever is later) for Group 2 storage vessels. A storage vessel affected facility that subsequently has its potential for VOC emissions decrease to less than 6 tpy shall remain an affected facility under this subpart.

**40CFR63 Subpart ZZZZ (National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines)**

Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. This Subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations. This section reflects EPA's final amendments to 40 CFR part 63, Subpart ZZZZ that were issued on January 15, 2013 and published in the Federal Register on January 30, 2013.

WVDEP DAQ has delegation of the area source air toxics provisions of this Subpart requiring Generally Achievable Control Technology (GACT). The provisions of this Subpart have been included in this general permit under Section 13.0.

Emission Unit ID#	Engine Description (Make, Model)	Engine Size (HP)	Date of Manufacture	New or Existing under 40CFR63 Subpart ZZZZ?	Provide Justification how 40CFR63 Subpart ZZZZ is met.
ENG001 through ENG005	Ford MSG-425	68 bhp	2015	New	40CFR63 Subpart ZZZZ is met by meeting the requirements in 40CFR60 Subpart JJJJ
ENG006 and ENG007	Ford CSG-637	99 bhp	2015	New	40CFR63 Subpart ZZZZ is met by meeting the requirements in 40CFR60 Subpart JJJJ

Are there any engines that fall in the window of being new under 40CFR60 Subpart ZZZZ but manufactured before the applicability date in 40CFR60 Subpart JJJJ?  Yes  No

## SOURCE AGGREGATION DETERMINATION

“Building, structure, facility, or installation” is defined as all the pollutant emitting activities which belong to the same industrial grouping, are located on one or more contiguous and adjacent properties, and are under the control of the same person.

Are there surrounding wells or compressor stations under “common control” of the applicant?

Yes       No

Are the properties in question located on “contiguous or adjacent” properties?

Yes       No

Are there surrounding facilities that share the same two (2) digit SIC code?

Yes       No

### ***Final Source Aggregation Decision.***

Source not aggregated with any other source.

Source aggregated with another source. List Company/Facility Name:

## RECOMMENDATION TO DIRECTOR

The information provided in the permit application, including all supplemental information received, indicates the applicant meets all the requirements of applicable regulations and the applicant has shown they meet the eligibility requirements of General Permit G70-C. Therefore, impact on the surrounding area should be minimized and it is recommended that the facility should be granted registration under General Permit G70-C.

Permit Engineer Signature: \_\_\_\_\_

Name and Title: David Keatley

Date: August 31, 2016