Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone (304) 926-0475
Fax (304) 926-0479

west virginia department of environmental protection

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

G70-B 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-B170A	FACILITY ID: **017-00050**

☐ 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):
EQT Production Company

Federal Employer ID No. (FEIN): 25-0724685

Applicant's Mailing Address: 625 Liberty Avenue, Suite 1700

City: Pittsburgh	State: PA	ZIP Code: 15222

Facility Name: WEU-2 Pad

Operating Site Physical Address: Bulldog Drive, West Union, WV
If none available, list road, city or town and zip of facility.

City: West Union	Zip Code: 26456	County: Doddridge

Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):
Latitude: 39.27255
Longitude: -80.77145

SIC Code: 1311 NAICS Code: 211111	Date Application Received: 4/28/2016
Fee Amount: $1,500.00	Date Fee Received: May 9, 2016
Applicant Ad Date: April 29, 2016	Newspaper: *The Doddridge Independent*
Date Application Complete: May 28, 2016	Due Date of Final Action: July 10, 2016

Engineer Assigned: William T. Rothwell II, P.E.

Description of Permitting Action: Modification to include one (1) low pressure separator, one (1) line heater, and one (1) vapor recovery unit. *This permitting action will supersede and replace G70-A170 issued on December 3, 2015.*

PROCESS DESCRIPTION

The following process description was taken from Registration Application G70-B170A:

This project involves the permitting of one (1) low pressure tower and associated heater (S050) and one (1) vapor recovery unit (S051). The wellpad currently consists of eleven (11) drilled wells.

The incoming gas/liquid/solid stream from the underground wells passes through a sand separator, where sand, water, and residual solids are displaced and transferred to the sand separator tank (S043). The gas stream then passes through a line heater (S022-S028, S044-S047) to raise/maintain temperature. The stream then passes through a high pressure separator, which separates gas (natural gas from the separator is sent to the sales line) from liquids (condensate and produced water). The liquids stream will then pass through a low pressure separator, where it is heated (S050) to volatilize (flash off) lighter hydrocarbons and separate condensate from water in the combined liquid stream. The flash gas from the condensate stream is recovered by the vapor recovery unit (S051), which utilizes a natural gas fired engine driven compressor to raise the pressure of the flash gas and route it back into the natural gas pipeline. The condensate is then transferred to the produced fluid storage vessels (S031-S042).

Emissions from the storage vessels are controlled by enclosed combustors (C001-C002). Once the tanks are filled, the contents are loaded into trucks for transport. EQT utilizes vapor balancing in the truck loading operations, which means the vapors displaced by the filling of tanker trucks (S049) are routed back into the battery of tanks and ultimately to the combustor. Facility electricity is provided by thermoelectric generators (S029-S030, S048).

SITE INSPECTION

Site Inspection Date: 7/1/2014
Site Inspection Conducted By: James Robertson
Results of Site Inspection: Site is appropriate for the facility.
Did Applicant meet Siting Requirements? Yes
If applicable, was siting criteria waiver submitted? NA
Directions to Facility: Travelling north on I79 take exit 119 at Clarksburg. Turn left onto US 50 and travel west for approximately 27.8 miles. Take a left at Doddridge County High School onto Bulldog Drive. Travel approximately 0.3 and take the first left at the first fork. The facility will be approximately 0.8 miles at the end of the road.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The following table indicates which methodology was used in the emissions determination:

Emission Unit ID#	Process Equipment	Calculation Methodology (e.g. ProMax, GlyCalc, mfg. data, AP-42, etc.)
S050	Line Heater	AP-42
S043	Sand Separator	E&P Tanks
S051	VRU Engine (110 hp)	Manufacturer's Data, AP-42

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

Pollutant	Pre-Facility Wide PTE (tons/year)	Post-Facility Wide PTE (tons/year)	PTE Change for Modification (tons/year)
Nitrogen Oxides	12.90	16.90	4.00
Carbon Monoxide	10.84	15.42	4.58
Volatile Organic Compounds	83.64	88.38	4.74
Particulate Matter-10/2.5	11.69	11.98	0.29
Sulfur Dioxide	0.08	0.09	0.01
Total HAPs	2.96	3.29	0.33
Carbon Dioxide Equivalent	21,372	20,834	-538

Maximum detailed controlled point source emissions were calculated by the applicant and checked for accuracy by the writer and are summarized in the table on the next page.

EQT Production Company WEU-2 Pad G70-B170A

Emission	Source	NO_x		CO		VOC		PM-10		SO_2		Total HAPs		CO2e
Point ID#		lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	ton/year
C001	Combustor (Tanks/Loading)	1.15	5.03	0.96	4.22	8.34	6.02	0.09	0.38	0.01	0.03	0.26	0.20	6069
C002	Combustor (Tanks/Loading)	1.15	5.03	0.96	4.22	8.34	6.02	0.09	0.38	0.01	0.03	0.26	0.20	6069
2-E028, E044-E047, I	12 Line Heaters	1.32	5.76	1.08	4.85	0.07	0.36	0.12	0.43	0.01	0.03	0.04	0.12	7101
C001, C002	Storage Vessels	0.00	0.00	0.00	0.00	1.87	8.18	0.00	0.00	0.00	0.00	0.06	0.28	128
C001, C002	Captured Liquid Loading	0.00	0.00	0.00	0.00	14.81	3.85	0.00	0.00	0.00	0.00	0.45	0.12	0
E029, E030,E048	3 Thermoelectric Generators	0.00	0.02	0.00	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	20
E043	Sand Separator Tank	0.00	0.00	0.00	0.00	0.04	0.18	0.00	0.00	0.00	0.00	<0.01	0.01	5
E051	VRU Engine	0.24	1.06	0.49	2.12	0.19	0.81	0.01	0.07	<0.01	<0.01	0.02	0.11	395
E049	Uncaptured Liquid Loading	0.00	0.00	0.00	0.00	126.96	33.01	0.00	0.00	0.00	0.00	3.88	1.01	0
Total Point Source		**3.86**	**16.90**	**3.49**	**15.42**	**160.62**	**58.43**	**0.31**	**1.26**	**0.03**	**0.09**	**4.97**	**2.05**	**19787**
Fugitive	Fugitive Venting	0.00	0.00	0.00	0.00	NA	29.95	0.00	0.00	0.00	0.00	NA	1.24	1047
HR	Haulroad Emissions	0.00	0.00	0.00	0.00	0.00	0.00	NA	10.72	0.00	0.00	0.00	0.00	0
Total Fugitive		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**29.95**	**0.00**	**10.72**	**0.00**	**0.00**	**0.00**	**1.24**	**1047**
Total Sitewide		**3.86**	**16.90**	**3.49**	**15.42**	**160.62**	**88.38**	**0.31**	**11.98**	**0.03**	**0.09**	**4.97**	**3.29**	**20834**

The total facility PTE for the facility (excluding fugitive emissions for VOC and PM) is shown in the following table: The fugitive emissions of a stationary source shall not be considered in determining whether it is a major stationary source for the purposes of 45CSR30-2.26.b or for eligibility of this General Permit:

Pollutant	G70-B Annual Emission Limits (tons/year)	Facility Wide PTE (tons/year)
Nitrogen Oxides	50	16.90
Carbon Monoxide	80	15.42
Volatile Organic Compounds	**80**	58.43
Particulate Matter-10/2.5	20	1.26
Sulfur Dioxide	20	0.09
Total HAPs	20	3.29

REGULATORY APPLICABILITY

45CSR2 (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers)

The purpose of 45CSR2 (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers) is to establish emission limitations for smoke and particulate matter which are discharged from fuel burning units.

45CSR2 states that any fuel burning unit that has a heat input under ten (10) MMBTU/hr is exempt from Sections 4 (weight emission standard), 5 (control of fugitive particulate matter), 6 (registration), 8 (testing, monitoring, recordkeeping, reporting) and 9 (startups, shutdowns, malfunctions). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date. If the individual heat input of all of the proposed fuel burning units are below 10 MMBTU/hr, these units are exempt from the aforementioned sections of 45CSR2. However, the registrant would be subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six minute block average. Fuel burning units greater than 10 MMBTU/hr are ineligible for registration under General Permit G70-B

Emission Unit ID#	Emission Unit Description	Maximum Design Heat Input (MDHI) (MMBTU/hr)
S022-S050	Line Heater	1.15 MMBTU/hr each

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.
C001 & C002	11.66	Yes	98 %	The combustors have minimal particulate matter emissions. Therefore, the combustors should demonstrate compliance with this section. The facility will demonstrate compliance by maintaining records of the amount of natural gas consumed by the combustors and the hours of

				operation. The facility will also monitor the flame of the combustors and record any malfunctions that may cause no flame to be present during operation.

45CSR10 (To Prevent and Control Air Pollution from the Emission of Sulfur Oxides)

45CSR10 establishes emission limitations for SO_2 emissions which are discharged from stacks of fuel burning units. A "fuel burning unit" means and includes any furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer. Sources that meet the definition of "Fuel Burning Units" per 45CSR10-2.8 include GPUs, in-line heaters, heater treaters, and glycol dehydration unit reboilers.

Fuel burning units less than 10 MMBtu/hr are exempt. The sulfur dioxide emission standard set forth in 45CSR10 is generally less stringent than the potential emissions from a fuel burning unit for natural gas. The SO_2 emissions from a fuel burning unit will be listed in the G70-B permit registration at the discretion of the permit engineer on a case-by-case basis. Issues such as non-attainment designation, fuel use, and amount of sulfur dioxide emissions will be factors used in this determination. Fuel burning units greater than 10 MMBTU/hr are ineligible for registration under General Permit G70-B

Fuel burning units burning natural gas are exempt from Section 8 (Monitoring, Recording and Reporting) as well as interpretive rule 10A. The G70-B eligibility requirements exclude from eligibility any fuel burning unit that does not use natural gas as the fuel; therefore, there are no permit conditions for 45CSR10.

Emission Unit ID#	Emission Unit Description	Maximum Design Heat Input (MDHI) (MMBTU/hr)
S022	Line Heater	1.15 MMBTU/hr

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-B Registration satisfies the construction, modification, relocation and operating permit requirements of 45CSR13. General Permit G70-B 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-B.

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-B 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-B, Section 13.

Emission Unit ID#	Engine Description (Make, Model)	Engine Size (HP)	Date of Manufacture	Provide Justification how 40CFR60 Subpart JJJJ is met.
S051	Ford CSG-637	110	>July 2010	☐ Met Emission Standard ☒ 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_2) 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-B 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
047-017-05912	June 2011 (Green Completion)
047-017-05913	June 2011 (Green Completion)
047-017-05917	June 2011 (Green Completion)
047-017-05914	May 2011 (Green Completion)
047-017-05915	June 2011 (Green Completion)
047-017-05916	June 2011 (Green Completion)
047-017-05957	May 2011 (Green Completion)

Centrifugal compressor affected facilities are included in General Permit G70-B, Section 11.0.
Are there any applicable centrifugal compressor affected facilities not located at the well site?
☐ Yes ☒ No

Each centrifugal compressor affected facility, which is a single centrifugal compressor using wet seals that is located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment. A centrifugal compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this Subpart.

Reciprocating compressor affected facilities are included in General Permit G70-B, Section 12.0.
Are there any applicable reciprocating compressor affected facilities not located at the well site?
☐ Yes ☒ No

Each reciprocating compressor affected facility, which is a single reciprocating compressor located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment. A reciprocating compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

Pneumatic controllers affected facilities are included in General Permit G70-B, 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-B, Section 7.0. Determination of storage vessel affected facility status is included in Section 6.0 of General Permit G70-B.
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.

The twelve (12) existing storage vessels are controlled by two (2) enclosed combustors that have a destruction efficiency of 98%. This is greater than the 95% percent destruction efficiency required in 40CFR60 Subpart OOOO. The controlled emissions from each of these storage vessels is less than 6 tons per year.

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.
S051	Ford CSG-637	110	>July 2010	New	Comply with 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.

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-B. Therefore, impact on the surrounding area should be minimized and it is recommended that the facility should be granted registration under General Permit G70-B.

Permit Engineer Signature: William D. Rothwell II

Name and Title: William T. Rothwell II, P.E.
Date: July 12, 2016