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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-3037
Plant ID No.: 009-00114
Applicant: Chesapeake Appalachia, L.L.C. (CHK)
Facility Name: Alan H. Degarmo Pad
Location: Wellsburg, Brooke County
NAICS Code: 211111
Application Type: Construction
Received Date: January 14, 2013
Engineer Assigned: Jerry Williams, P.E.
Fee Amount: \$2,000.00
Date Received: February 4, 2013
Complete Date: February 11, 2013
Due Date: May 12, 2013
Applicant Ad Date: January 11, 2013
Newspaper: *The Intelligencer* (Wheeling)
UTM's: Easting: 536.386 km Northing: 4,455.184 km Zone: 17T
Description: This permitting action proposes the installation of one (1) natural gas fired flash gas compressor, two (2) gas production unit (GPU) burners, one (1) heater treater, two (2) temporary line heaters, three (3) 400 barrel (bbl) condensate tanks, three (3) 400 bbl produced water tanks, condensate truck loading, produced water truck loading, and one (1) vapor combustor.

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-3037:

The facility is an oil and natural gas exploration and production facility, responsible for the production of natural gas. Storage of condensate and produced water will also occur on site. Condensate, gas, and water come from the wellhead(s) to the production units, where the first stage of separation occurs. Fluids (condensate and produced water) will be sent to the heater treater. Heater Treaters are used to treat emulsions, which are stable mixtures of condensate, solids, and water. These units use thermal, gravitational, mechanical, and sometimes chemical methods to break the emulsions and separate the condensate from water. Elevating the emulsion

temperature is particularly effective in lowering condensate viscosity and promoting phase separation. The process causes hydrocarbons, including methane, to vaporize and escape. The flash from the heater treater is captured via a flash gas compressor driven by a natural gas fired engine. Produced water from the heater treater flows into three (3) 400-bbl produced water tanks. Condensate flows into a low pressure tower. Flash gases from the low pressure tower are routed via hard piping (with 100% capture efficiency) to the inlet of the flash gas compressor. Condensate flows to the three (3) 400-bbl condensate storage tanks. The natural gas stream will exit the facility via pipeline. Condensate and produced water are transported off site via truck. Loading emissions will be controlled with vapor return, which has at least 70% capture efficiency, routed to the vapor combustor for at least 98% destruction efficiency. Working, breathing and flashing vapors from the 400 bbl condensate storage tanks and 400 bbl brine/produced water storage tanks will be routed to the vapor combustors with 98% destruction efficiency. The vapor combustor has a natural gas fired pilot to ensure a constant flame for combustion.

SITE INSPECTION

A site inspection was conducted by Steve Sobotka of the Northern Panhandle Regional Office on January 24, 2013. Mr. Sobotka stated that the site is relatively remote and is located on old farmland. In addition, he states that the closest residence is more than 300 feet from the site.

Directions as given in the permit application are as follows:

Latitude: 40.246312
Longitude: -80.572186

From the intersection of State Route 2 and State Route 27 (10th Street) in Wellsburg, travel east on State Route 27 for 2.6 miles to the intersection of State Route 27 and County Route 27/4 (Genteel Road).

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this modification application consist of the combustion emissions from the compressor engine (EU-ENG1), two (2) GPU burners (EU-GPU1-2), one (1) heater treater (EU-HT1), two (2) line heaters (EU-LH1-2), three (3) condensate tanks (EU-TANKS-COND), three (3) produced water tanks (EU-TANKS-PW), condensate truck loading (EU-LOAD-COND), produced water truck loading (EU-LOAD-PW), one (1) vapor combustor (APC-COMB-TKLD), one (1) vapor combustor pilot (EU-PILOT), and fugitive emissions (EU-FUG).

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

Emission Unit ID#	Process Equipment	Calculation Methodology
EU-ENG1	145 hp Caterpillar G3306 NA Compressor Engine w/ NSCR ¹	Manufacturer's Data
EU-GPU1	1.0 MMBTU/hr Gas Production Unit Burner ²	EPA AP-42 Emission Factors
EU-GPU2	1.0 MMBTU/hr Gas Production Unit Burner ²	EPA AP-42 Emission Factors
EU-HT1	0.5 MMBTU/hr Heater Treater ³	EPA AP-42 Emission Factors
EU-LH1	1.5 MMBTU/hr Line Heater ⁴	EPA AP-42 Emission Factors
EU-LH2	1.5 MMBTU/hr Line Heater ⁴	EPA AP-42 Emission Factors
EU-TANKS-COND	Three (3) 400 bbl Condensate Tanks ⁵	EPA Tanks 4.09 Emission Estimation Software, Promax Process Simulation
EU-TANKS-PW	Three (3) 400 bbl Produced Water Tanks ⁵	EPA Tanks 4.09 Emission Estimation Software, Promax Process Simulation
EU-LOAD-COND	Condensate Truck Loading ⁶	EPA AP-42 Emission Factors
EU-LOAD-PW	Produced Water Truck Loading ⁶	EPA AP-42 Emission Factors
APC-COMB-TKLD	15.0 MMBTU/hr Vapor Combustor ⁷	EPA AP-42 Emission Factors, TCEQ Air Permit Technical Guidance, Mass Balance
EU-PILOT	Vapor Combustor Pilot	EPA AP-42 Emission Factors

¹ Per Caterpillar, NMNEHC emission factor does not include formaldehyde, therefore, NMNEHC and formaldehyde factors have been added to arrive at total VOC. In addition, per AP-42, all PM from combustion of natural gas (total, condensable, and filterable PM) is presumed < 1 micrometer.

² Per AP-42, all PM from combustion of natural gas (total, condensable, and filterable PM) is presumed < 1 micrometer.

³ Per AP-42, all PM from combustion of natural gas (total, condensable, and filterable PM) is presumed < 1 micrometer.

⁴ Even though line heaters are temporary, emissions have been calculated assuming full time operation for a conservative estimate. Per AP-42, all PM from combustion of natural gas (total, condensable, and filterable PM) is presumed < 1 micrometer.

⁵ Maximum annual emissions based on average daily production with rolling daily throughput total not to exceed maximum annual throughput.

⁶ Maximum hourly based on average hourly truck loading rate.

⁷ NOx and CO emission factors are from TCEQ Air Permit Technical Guidance for Flares and Thermal Oxidizers. PM emission factors are from EPA AP-42.

Fugitive emissions for the facility are based on calculation methodologies presented in the 2009 American Petroleum Institute Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Gas Industry. The factors presented in the API Compendium are for methane emissions. Therefore, the fugitive VOC and HAP emissions were calculated using a representative gas analysis and the weight percent of each respective pollutant.

The following table indicates the control device efficiencies that are required for this facility:

Emission Unit	Pollutant	Control Device	Control Efficiency
EU-ENG1 Compressor Engine	Nitrogen Oxides	Non Selective Catalytic Reduction (NSCR)	92.58 %
	Carbon Monoxide		85.15 %
EU-TANKS-COND, EU-TANKS-PW Storage Tanks	Volatile Organic Compounds	Vapor Combustor	98.00 %
	Total HAPs		98.00 %
EU-LOAD-COND, EU-LOAD-PW Loadout Racks	Volatile Organic Compounds	Vapor Return/ Combustion	69.00 %

Maximum controlled point source emissions were calculated by CHK and checked for accuracy by the writer and are summarized in the table below.

Emission Point ID	Emission Unit ID	Process Unit	Pollutant	Maximum Controlled Emission Rate	
				Hourly (lb/hr)	Annual (ton/year)
EP-ENG1	EU-ENG1	145 HP Caterpillar G3306 NA 4SRB Compressor Engine	Nitrogen Oxides	0.32	1.40
			Carbon Monoxide	0.64	2.80
			Sulfur Dioxide	<0.01	<0.01
			Particulate Matter-10	0.01	0.04
			Total Volatile Organic Compounds	0.24	1.05
			Formaldehyde	0.09	0.39
			Total HAPs	0.10	0.45
			Carbon Dioxide Equivalent	155.18	616.62
EP-GPU1 EP-GPU2 Each	EU-GPU1 EU-GPU2 Each	1.0 MMBTU/hr Gas Production Unit (GPU) Burner	Nitrogen Oxides	0.11	0.48
			Carbon Monoxide	0.09	0.39
			Sulfur Dioxide	< 0.01	< 0.01
			Particulate Matter-10	0.01	0.03
			Volatile Organic Compounds	0.01	0.03
			Formaldehyde	< 0.01	< 0.01
			Total HAPs	< 0.01	0.01
			Carbon Dioxide Equivalent	117.00	512.48
EP-HT1	EU-HT1	0.50 MMBTU/hr Heater Treater	Nitrogen Oxides	0.06	0.26
			Carbon Monoxide	0.05	0.22
			Sulfur Dioxide	< 0.01	< 0.01
			Particulate Matter-10	< 0.01	0.01
			Volatile Organic Compounds	< 0.01	0.01
			Formaldehyde	< 0.01	< 0.01
			Total HAPs	< 0.01	< 0.01
			Carbon Dioxide Equivalent	58.50	256.24
			Nitrogen Oxides	0.17	0.74

EP-LH1	EU-LH1	1.50 MMBTU/hr Line Heater	Carbon Monoxide	0.14	0.61
			Sulfur Dioxide	< 0.01	< 0.01
			Particulate Matter-10	0.01	0.04
			Volatile Organic Compounds	0.01	0.04
			Formaldehyde	< 0.01	< 0.01
			Total HAPs	< 0.01	0.01
			Carbon Dioxide Equivalent	175.51	768.71
EP-TANKS-COND	EU-TANKS-COND	3 – 400 bbl Condensate Tanks	Volatile Organic Compounds	2.57	11.25
			Total HAPs	0.14	0.61
EP-TANKS-PW	EU-TANKS-PW	3 -400 bbl Produced Water Tanks	Volatile Organic Compounds	<0.01	0.02
			Total HAPs	< 0.01	<0.01
EU-LOAD-COND	EP-LOAD-COND	Condensate Truck Loading	Volatile Organic Compounds	2.35	10.30
			Total HAPs	0.13	0.56
			Carbon Dioxide Equivalent	0.37	1.62
EU-LOAD-PW	EP-LOAD-PW	Produced Water Truck Loading	Volatile Organic Compounds	0.01	0.05
			Total HAPs	< 0.01	<0.01
			Carbon Dioxide Equivalent	0.11	0.49
APC-COMB-TKLD	APC-COMB-TKLD	15.0 MMBTu/hr Vapor Combustor Tank Loading Stream	Nitrogen Oxides	2.07	9.07
			Carbon Monoxide	4.13	18.09
			Sulfur Dioxide	<0.01	<0.01
			Particulate Matter-10	0.05	0.22
			Volatile Organic Compounds	2.63	11.52
			Formaldehyde	<0.01	<0.01
			Total HAPs	0.15	0.64
Carbon Dioxide Equivalent	1,755.05	7,687.13			
EU-PILOT	EP-PILOT	Vapor Combustor	Nitrogen Oxides	0.01	0.04
			Carbon Monoxide	<0.01	0.02
			Sulfur Dioxide	<0.01	<0.01
			Particulate Matter-10	<0.01	<0.01
			Volatile Organic Compounds	<0.01	<0.01

		Pilot	Formaldehyde	<0.01	<0.01
			Total HAPs	<0.01	<0.01
			Carbon Dioxide Equivalent	5.29	23.19
EU-FUG	EP-FUG	Fugitive Emissions	Volatile Organic Compounds	0.55	2.40
			Total HAPs	0.02	0.09
			Carbon Dioxide Equivalent	10.29	44.95

The following table represents the proposed emissions associated with this application:

Pollutant	Maximum Annual Facility Wide Emissions (tons/year)
Nitrogen Oxides	13.21
Carbon Monoxide	23.13
Volatile Organic Compounds	36.74
Particulate Matter	8.93
Sulfur Dioxide	0.02
n-Hexane	1.36
Xylenes	0.39
Formaldehyde	0.09
Total HAPs	2.10
Carbon Dioxide Equivalent	11,256

REGULATORY APPLICABILITY

Unless otherwise stated WVDEP DAQ did not determine whether the permittee is subject to an area source air toxics standard requiring Generally Achievable Control Technology (GACT) promulgated after January 1, 2007 pursuant to 40 CFR 63, including the area source air toxics provisions of 40 CFR 63, Subpart ZZZZ.

The following rules apply to the facility:

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) million B.T.U.'s per hour 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.

The individual heat input of all of the proposed fuel burning units (EP-GPU1-2, EP-HT1 and EP-LH1-2) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR2. However, CHK would be subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six minute block average.

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

The purpose of this rule is to prevent and control air pollution from combustion of refuse.

CHK has one (1) vapor combustor at the Alan H. Degarmo pad. The vapor combustor is subject to section 4, emission standards for incinerators. The vapor combustor has an allowable emission rate of 269.37 pounds of particulate matter per hour (assuming a natural gas density of 0.044 lb/ft³). The vapor combustor has an hourly particulate matter emissions rate of 0.05 lb/hr. Therefore, the facility's vapor combustor should demonstrate compliance with this section. The facility will demonstrate compliance by maintaining records of the amount of natural gas consumed by the vapor combustor and the hours of operation. The facility will also monitor the flame of the vapor combustor and record any malfunctions that may cause no flame to be present during operation.

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

45CSR10 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 3 (weight emission standard), 6 (registration), 7 (permits), and 8 (testing, monitoring, recordkeeping, reporting). 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.

The individual heat input of all of the proposed fuel burning units (EP-GPU1-2, EP-HT1 and EP-LH1-2) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR10.

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 CHK is defined as a "stationary source" under 45CSR13 Section 2.24.b, which states that an owner or operator 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. CHK's volatile organic compounds (VOC) emissions exceed 45CSR13 permit thresholds. CHK has published the required Class I legal advertisement notifying the public of their permit application, and paid the appropriate application fee (construction).

45CSR22 (Air Quality Management Fee Program)

This facility is a minor source and not subject to 45CSR30. CHK is required to keep their Certificate to Operate current.

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

40CFR60.4230 states that a source that commenced construction after June 12, 2006 whose SI ICE was less than 500 hp and was manufactured on or after July 1, 2008 is subject to this rule. Since the SI ICE that CHK will install was manufactured after January 1, 2011, CHK is subject to this rule. The proposed 145 hp compressor engine will be subject to the following emission standards:

NO_x: 1.0 g/HP-hr (0.32 lb/hr)
CO: 2.0 g/HP-hr (0.64 lb/hr)
VOC: 0.7 g/HP-hr (0.22 lb/hr)

The proposed engine meets these standards.

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

EPA published in the Federal Register new source performance standards (NSPS) and air toxics rules for the oil and gas sector on August 16, 2012. 40CFR60 Subpart OOOO establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO₂) emissions from affected facilities that commence construction, modification or reconstruction after August 23, 2011. The following affected sources which commence construction, modification or reconstruction after August 23, 2011 are subject to the applicable provisions of this subpart:

- a. Each gas well affected facility, which is a single natural gas well.

The gas wells that currently exist at the Alan H. Degarmo Pad were drilled principally for the production of natural gas and were done so after August 23, 2011. Therefore, these wells would be considered affected facilities under this subpart. The compliance date for these hydraulically fractured wells is October 15, 2012. CHK is required under §60.5410 to submit an initial notification, initial annual report, maintain a log of records for each well completion, and maintain records of location and method of compliance. §60.5420 requires CHK demonstrate continuous compliance by submitting reports and maintaining records for each completion operation.

- b. 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. For the purposes of this subpart, your centrifugal compressor is considered to have commenced construction on the date the compressor is installed (excluding

relocation) at the facility. 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.

There are no centrifugal compressors at the Alan H. Degarmo Pad. Therefore, all requirements regarding centrifugal compressors under 40 CFR 60 Subpart OOOO would not apply.

- c. 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. For the purposes of this subpart, your reciprocating compressor is considered to have commenced construction on the date the compressor is installed (excluding relocation) at the facility. 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.

There is one (1) 145 hp reciprocating internal combustion engine located at the Alan H. Degarmo Pad. This engine will be delivered after the effective date of this rule. However, §60.5365(c) states that 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. Therefore, all requirements regarding reciprocating compressors under 40 CFR 60 Subpart OOOO would not apply.

- d. Pneumatic Controllers

- 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 which commenced construction after August 23, 2011, and is located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment and not located at a natural gas processing plant.
- Each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller which commenced construction after August 23, 2011, and is located at a natural gas processing plant.

There are no continuous bleed gas-driven pneumatic controllers at the Alan H. Degarmo Pad. Therefore, all requirements regarding pneumatic controllers under 40 CFR 60 Subpart OOOO would not apply.

- e. 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.

40CFR60 Subpart OOOO defines a storage vessel as a unit that is constructed primarily of nonearthen materials (such as wood, concrete, steel, fiberglass, or plastic) which provides structural support and is designed to contain an

accumulation of liquids or other materials. The following are not considered storage vessels:

- Vessels that are skid-mounted or permanently attached to something that is mobile (such as trucks, railcars, barges or ships), and are intended to be located at a site for less than 180 consecutive days. If the source does not keep or are not able to produce records, as required by §60.5420(c)(5)(iv), showing that the vessel has been located at a site for less than 180 consecutive days, the vessel described herein is considered to be a storage vessel since the original vessel was first located at the site.
- Process vessels such as surge control vessels, bottoms receivers or knockout vessels.
- Pressure vessels designed to operate in excess of 204.9 kilopascals and without emissions to the atmosphere.

This rule requires that the permittee determine the VOC emission rate for each storage vessel affected facility utilizing a generally accepted model or calculation methodology within 30 days of startup, and minimize emissions to the extent practicable during the 30 day period using good engineering practices. For each storage vessel affected facility that emits more than 6 tpy of VOC, the permittee must reduce VOC emissions by 95% or greater within 60 days of startup. The compliance date for applicable storage vessels is October 15, 2013.

The storage vessels located at the Alan H. Degarmo Pad are controlled by a vapor combustor and emit less than 6 tpy of VOC. Therefore, CHK is not required by this section to reduce VOC emissions by 95%.

- f. The group of all equipment, except compressors, within a process unit is an affected facility.
- Addition or replacement of equipment for the purpose of process improvement that is accomplished without a capital expenditure shall not by itself be considered a modification under this subpart.
 - Equipment associated with a compressor station, dehydration unit, sweetening unit, underground storage vessel, field gas gathering system, or liquefied natural gas unit is covered by §§60.5400, 60.5401, 60.5402, 60.5421 and 60.5422 of this subpart if it is located at an onshore natural gas processing plant. Equipment not located at the onshore natural gas processing plant site is exempt from the provisions of §§60.5400, 60.5401, 60.5402, 60.5421 and 60.5422 of this subpart.
 - The equipment within a process unit of an affected facility located at onshore natural gas processing plants and described in paragraph (f) of this section are exempt from this subpart if they are subject to and controlled according to subparts VVa, GGG or GGGa of this part.

The Alan H. Degarmo Pad is not a natural gas processing plant. Therefore, Leak Detection and Repair (LDAR) requirements for onshore natural gas processing plants would not apply.

- g. Sweetening units located at onshore natural gas processing plants that process natural gas produced from either onshore or offshore wells.
- Each sweetening unit that processes natural gas is an affected facility; and
 - Each sweetening unit that processes natural gas followed by a sulfur recovery unit is an affected facility.
 - Facilities that have a design capacity less than 2 long tons per day (LT/D) of hydrogen sulfide (H₂S) in the acid gas (expressed as sulfur) are required to comply with recordkeeping and reporting requirements specified in §60.5423(c) but are not required to comply with §§60.5405 through 60.5407 and paragraphs 60.5410(g) and 60.5415(g) of this subpart.
 - Sweetening facilities producing acid gas that is completely reinjected into oil-or-gas-bearing geologic strata or that is otherwise not released to the atmosphere are not subject to §§60.5405 through 60.5407, 60.5410(g), 60.5415(g), and 60.5423 of this subpart.

There are no sweetening units at the Alan H. Degarmo Pad. Therefore, all requirements regarding sweetening units under 40 CFR 60 Subpart OOOO would not apply.

The following rules do not apply to the facility:

40CFR60 Subpart 60.18 (General Control Device and Work Practice Requirements)

40CFR60 Subpart 60.18 contains requirements for control devices when they are used to comply with applicable subparts of 40CFR60 and 40CFR61. The vapor combustor that CHK has proposed is not used to comply with one of these rules. The purpose of the vapor combustor is to control emissions from the tanks that are routed to it. However, these tanks are not subject to 40CFR60 Subpart Kb due to their size. In addition 40CFR60.18 refers to flares but makes no mention of vapor combustors, which are essentially enclosed combustion devices. Therefore, CHK is not subject to this standard.

40CFR60 Subpart Kb (Standards of Performance for VOC Liquid Storage Vessels)

40CFR60 Subpart Kb does not apply to storage vessels with a capacity less than 75 cubic meters. The tanks that CHK has proposed to install are 63.60 cubic meters each. Therefore, CHK would not be subject to this rule.

40CFR60 Subpart KKK (Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants)

40CFR60 Subpart KKK applies to onshore natural gas processing plants that commenced construction after January 20, 1984, and on or Before August 23, 2011. The Alan H. Degarmo Pad was constructed after August 23, 2011 and is not a natural gas processing plant, therefore, CHK would not be subject to this rule.

45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants)

45CSR19 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment)

The Alan H. Degarmo Pad is located in Brooke County which is a non-attainment county for Particulate Matter 2.5. Because Brooke County is a non-attainment county, 45CSR19 does apply to this facility.

As shown in the table below, CHK is not subject to 45CSR14 or 45CSR19 review.

Pollutant	PSD (45CSR14) Threshold (tpy)	NANSR (45CSR19) Threshold (tpy)	Alan H. Degarmo PTE (tpy)	45CSR14 or 45CSR19 Review Required?
Carbon Monoxide	250	NA	23.13	No
Nitrogen Oxides	250	100	13.21	No
Sulfur Dioxide	250	100	0.02	No
Particulate Matter 2.5	250	100	8.93	No
Ozone (VOC)	250	NA	36.74	No
Greenhouse Gas (CO ₂ e)	100,000	NA	11,256	No

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

There will be small amounts of various non-criteria regulated pollutants emitted from the combustion of natural gas. However, due to the concentrations emitted, detailed toxicological information is not included in this evaluation.

AIR QUALITY IMPACT ANALYSIS

Modeling was not required of this source due to the fact that the facility is not subject to 45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants) as seen in the table listed in the Regulatory Discussion Section.

SOURCE AGGREGATION

“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.

The Alan H. Degarmo Pad is located in Brooke County and will be operated by CHK, who is partial owner and operator. Several different entities are involved in the production, gathering, and transmission of gas. The Operators are the parties who drill and operate the wells. The Shippers are the owners of the gas who may or may not be the same entity as the Operator. There are also parties who own and operate the gathering system pipelines and compression station, called Gatherers. In addition, there are parties that own and operate the gas processing plants.

1. The Alan H. Degarmo Pad will operate under SIC code 1311 (Crude Petroleum and Natural Gas Extraction). There are surrounding wells and compressor stations operated by CHK that share the same two-digit major SIC code of 13 for oil and gas exploration and production. Therefore, the Alan H. Degarmo Pad does share the same SIC code as the wells and surrounding compressor stations.
2. “Contiguous or Adjacent” determinations are made on a case by case basis. These determinations are proximity based, and it is important to focus on this and whether or not it meets the common sense notion of a plant. The terms “contiguous” or “adjacent” are not defined by USEPA. Contiguous has a dictionary definition of being in actual contact; touching along a boundary or at a point. Adjacent has a dictionary definition of not distant; nearby; having a common endpoint or border.

The closest well to the Alan H. Degarmo Pad is over one quarter (1/4) mile away. Operations separated by these distances do not meet the common sense notion of a plant. Therefore, the properties in question are not considered to be on contiguous or adjacent property.

3. According to CHK, none of the wells in the area are under common control with the Alan H. Degarmo Pad. The Alan H. Degarmo Pad is operated by CHK but is owned and controlled by a group of non-affiliated companies. Through proprietary agreements, CHK’s operation of the Alan H. Degarmo Pad is controlled by the system owners. The ownership and control of the wells in the area may be distinct for each well and is not necessarily known by CHK. The owners and operators of the wells each may take their gas in kind and consequently affect the operation of the wells in which they have an ownership interest. Furthermore, no well is dependent on the operation of the Alan H. Degarmo Pad to function, nor is the Alan H. Degarmo Pad dependent on any specific well to operate. From this analysis, CHK is not under common control with other wells in the area.

Because the facilities are not considered to be on contiguous or adjacent properties and are not fully under control of the same person, the emissions from the Alan H. Degarmo Pad should not be aggregated with other facilities in determining major source or PSD status.

MONITORING OF OPERATIONS

CHK will be required to perform the following monitoring associated with this permit application:

1. Monitor and record quantity of natural gas consumed for all engines, and combustion sources.
2. Monitor the presence of the vapor combustor pilot flame with a thermocouple or equivalent.
3. Monitor opacity from all fuel burning units.
4. Monitor the tanks to ensure that all vapors are sent to vapor combustor.
5. Monitor the condensate truck loading to ensure that vapor return/combustion is used.

CHK will be required to perform the following recordkeeping associated with this modification application:

1. Maintain records of the amount of natural gas consumed in each combustion source.
2. Maintain records of testing conducted in accordance with the permit. Said records shall be maintained on-site or in a readily accessible off-site location
3. Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit.
4. Maintain records of the visible emission opacity tests conducted per the permit.
5. Maintain a record of all potential to emit (PTE) HAP calculations for the entire facility. These records shall include the natural gas compressor engines and ancillary equipment.
6. The records shall be maintained on site or in a readily available off-site location maintained by CHK for a period of five (5) years.
7. Monitor the tanks to ensure that the tanks vapors will be sent to vapor combustor.
8. Monitor the condensate truck loading to ensure that vapor return/combustion is used.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates CHK's Alan H. Degarmo Pad meets all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the Brooke County location should be granted a 45CSR13 construction permit for this proposed permitting action.

Jerry Williams, P.E.
Engineer

Date