west virginia department of environmental protection

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

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

ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2826H
Plant ID No.:	051-00127
Applicant:	Williams Ohio Valley Midstream LLC (Williams)
Facility Name:	Fort Beeler Gas Processing Plant
Location:	Cameron, Marshall County
SIC Code:	1321 (Extraction Plant)
NAICS Code:	211112
Application Type:	Modification
Received Date:	August 20, 2014 (Application Resubmittal)
Engineer Assigned:	Jerry Williams, P.E.
Fee Amount:	$4,500.00
Date Received:	May 12, 2014
Complete Date:	September 12, 2014
Due Date:	December 11, 2014
Applicant Ad Date:	May 19, 2014
Newspaper:	*Moundsville Daily Echo*
UTM's:	Easting: 535.00 km Northing: 4414.35 km Zone: 17
Description:	Modification of a natural gas processing facility to install one (1) new process flare (FL-02) and one (1) emergency generator engine (GE-01). Williams has submitted a permit application (R13-3212) for the co-located Groves Facility which has one (1) glycol dehydration unit (DH-01) and associated reboiler (BLR-01). This modification also removes the condensate stabilizer heater, removes run time restrictions on engines (CE-03 – CE-05), removes run time restrictions on regen gas heaters (H-03, H04) and incorporates new emission estimating protocols.

ID # 051-00127
Reg R13-2826H
Company WILLIAMS OVM
Facility FT. BEELER Initials JW

NON-CONFIDENTIAL

PERMIT HISTORY

On March 29, 2010, Permit Number R13-2826 was issued to Caiman Eastern Midstream, LLC (CEM) for the construction and operation of Fort Beeler Station - a natural gas processing facility. Since that time, the facility has been the subject of additional permitting actions. Each of these will be summarized below.

- On June 2, 2010, Permit Number R13-2841T was issued to CEM for temporary addition of a 1,085 HP natural gas-fired compressor engine and Joule-Thompson cooling unit (J-T Skid) to remove non-methane/ethane organics. The permit expired on June 2, 2011.

- On August 17, 2010, Permit Application R13-2826A was withdrawn.

- On October 17, 2010, Permit Number R13-2826B was issued to CEM for addition of two (2) generator engines, a mole sieve regeneration heater, a hot oil heater, a methanol tank, a cryogenic plant, three (3) residue gas compression engines, and expanded truck loading of natural gas liquids (NGL).

- On June 30, 2011, Permit Application R13-2826C was withdrawn.

- On August 9, 2011, Permit Number R13-2826D was issued to CEM for addition of a second cryogenic unit to allow processing up to 200 mmscf/day, elimination of one of the two generator engines (13S), and replacement of one of the other engines (3S) with a slightly larger engine (26S).

- On January 30, 2012, Permit Number R13-2826E was issued to CEM to increase the size and hours of operation of the medium heater (23S), installation of a flare for management of gas during certain anticipated maintenance activities, and the removal of a hot oil heater (5S).

- On May 2, 2012, Permit Number R13-2826F was issued to CEM to install a third cryogenic plant. In addition, two (2) engines (2S, 4S) and the J-T Skid (9S) were removed from the permit.

- Additionally, on May 15, 2012, CEM changed its name to Williams Ohio Valley Midstream (Williams).

- On December 17, 2012, Permit Number R13-2826G was issued to Williams for the removal from service of a Caterpillar G3516LE Engine (12S); reactivation of a Caterpillar G342NA Engine (previously designated as 4S); decrease of fuel usage limits on Engines 18S, 19S, and 20S; increase of Maximum Design Heat Inputs (MDHIs) on Process Heaters (14S, 21S, 22S, 23S, 29S, and 30S), addition of a new Condensate Stabilizer Heater (31S), and increase of flare (27S) purge-gas throughput.

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-2826H:

The facility currently receives gas from local production wells and processes this gas through cryogenic processes, removing natural gas liquids from the inlet gas. The facility has the capacity to process 520 million standard cubic feet per day (mmscfd) of raw natural gas through one (1) 120 mmscfd cryogenic plant (Plant 1), and two (2) 200 mmscfd cryogenic plants (Plant 2 and Plant 3).

The following modifications are proposed as part of this application:

- Add new process flare (FL-02).
- Remove condensate stabilizer heater.
- Remove run time restrictions on Caterpillar G3612LE engines (CE-03, CE-04, CE-05).
- Remove run time restrictions on TXP-2/TXP-3 regen gas heaters (H-03, H-04).
- Add new emergency generator engine (GE-01).
- Incorporate improved emission estimating protocols.
- Incorporate other minor changes at the site.

Cryogenic Process (Fugitives)
The cryogenic process utilizes an expansion turbine to drop the temperature of the inlet gas to approximately -120 °F. This rapid temperature drop condenses much of the ethane (C_2H_6) and most of the other hydrocarbons (primarily propane (C_3H_8) and butane (C_4H_{10}), with deminimis hexane, benzene, toluene, ethylbenzene, xylene (together C5+)), while maintaining methane (CH_4) in gaseous form. As this is a totally enclosed system, the only emissions are fugitives from piping and equipment. These emissions are controlled by implementation of a leak detection and repair (LDAR) program.

Compressor Engines
Five (5) natural gas fueled compressor engines are utilized in the plant processes. Each of these engines is equipped with emission control technology applicable to the operation. The rich burn engines (CE-01, CE-02) utilize non-selective catalytic reduction (NSCR) and the lean burn engines (CE-03 – CE-05) utilize catalytic oxidation (oxidation catalyst (OxCat)).

Glycol Dehydrator
One (1) glycol dehydrator is used to dehydrate a portion of the inlet gas coming into the facility from the Lucey line. This unit is part of the co-located Groves Facility.

Emergency Generator Engine
One (1) emergency generator engine will be used to provide electrical power for various activities at the site in the event of loss of purchase power. The emergency generator engine will burn either natural gas or propane fuel.

Heaters

Six (6) natural gas fueled heaters are used at the facility. The Regen Heaters (H-02 – H04) are used to regenerate the mole sieves necessary to further dry the inlet gas and the hot oil heater (H-01) and medium heaters (H-05, H-06) are used on the NGL de-methanizers.

Process Flares
Two (2) process flares are used at the facility to safely combust natural gas and NGL during routine operation. The existing flare (FL-01) will primarily be used to combust natural gas releasing during general maintenance activities and it is estimated that up to 5 mmscf/yr will be combusted during these routine events. The flare will also be used to control emissions in the event of an upset. The new flare (FL-02) will be used to combust natural gas and NGL released during routine operation as well as upset conditions and it is estimated up to 59.2 mmscf/yr will be combusted during routine operation. During normal operating conditions, gas sent to the new flare (FL-02) will be associated with maintenance activities performed at the inlet, TXP1, TXP2 and TXP3 facilities. The top non-emergency vents to the flare system include the TXP1 Inlet Gas Separator (V-410, TXP2 Product Surge Tank (V-2404), TXP1 Product Surge Tank (V-404), TXP1 Cold Separator (V-402) and TXP1 Inlet Filter/Coalescer (F-441). The flare will also be used to control emissions in the event of an upset. The amount of gas routed to each flare during a given event will vary widely and combustion is anticipated to be a minimum of 98% efficient.

Storage Tanks
There are numerous tanks at the facility used to store various materials such as produced water, condensate, NGLs, lube oil, glycol, etc. The only storage tanks with significant emissions to the atmosphere are the produced water tanks (T-03 and T-04). All other storage tanks at the site have deminimis emissions. There are no emissions from the fourteen (14) pressure vessels during normal operation.

Truck Loading
There are emissions from the truck loading of produced water/oil (TLO). Loading of NGLs will be accomplished under pressure resulting in no emissions to the atmosphere.

SITE INSPECTION

Due to the nature of the modification, the writer did not conduct a site inspection. According to information in the DAQ database, the last on-site inspection occurred on September 17, 2013 by Mr. Steven Sobutka of the Compliance/Enforcement Section. The facility was given a status code of "30 - In Compliance" as a result of the inspection.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this modification application consist of the combustion emissions from three (3) natural gas fired compressor engines (CE-03 – CE-05), one (1) emergency generator (GE-01), six (6) heaters (H-01 – H-06), one (1) process flare, startup shutdown maintenance (SSM) and rod packing/crankcase emissions. The emissions from the co-located Groves Facility which consists of one (1) TEG dehydrator still vent (DH-01) and one (1) TEG dehydrator reboiler (BLR-01) are included since the facility's emissions would be aggregated as one single source for PSD and Title V purposes. Fugitive emissions for the facility are based on calculation methodologies presented in EPA Protocol for Equipment Leak Emission Estimates. The following table indicates which methodology was used in the emissions determination:

Emission Point ID#	Process Equipment	Calculation Methodology
CE-01	225 hp Caterpillar G342NA Reciprocating Internal Combustion Engine (RICE) w/ NSCR	Manufacturer's Data, EPA AP-42 Emission Factors
CE-02	625 hp Caterpillar G398TA RICE w/ NSCR	Manufacturer's Data, EPA AP-42 Emission Factors
CE-03 – CE-05	3,550 hp Caterpillar G3612LE RICE w/ SCR	Manufacturer's Data, EPA AP-42 Emission Factors
SSM	Startup, Shutdown and Maintenance Activities	Engineering Estimate
RPC	Rod Packing and Engine Crankcase Leaks	Engineering Estimate
GE-1	118 hp Olympian G70LG Emergency Generator	Manufacturer's Data, EPA AP-42 Emission Factors
H-01	10 MMBTU/hr TXP1 Hot Oil Heater	EPA AP-42 Emission Factors
H-02	4.74 MMBTU/hr TXP1 Regen Gas Heater	EPA AP-42 Emission Factors
H-03, H-04	6.6 MMBTU/hr TXP2 & TXP3 Regen Gas Heaters	EPA AP-42 Emission Factors
H05, H06	21.22 MMBTU/hr TXP2 & TXP3 Medium Heaters	EPA AP-42 Emission Factors
FL-01	5.0 mmscf/yr Process Flare	Engineering Estimate, EPA AP-42 Emission Factors
FL-02	59.21 mmscf/yr Process Flare	Engineering Estimate, EPA AP-42 Emission Factors
T-03, T-04	400 bbl (16,800 gal) Produced Water Storage Tank	EPA Tanks 4.09d and VMGSim Model
TLO	Truck Loadout Emissions	EPA AP-42 Emission Factors, Splash Loading
DH-01 GROVES	5 mmscfd TEG Dehydrator Still Vent w/ Recycle	GRI-GlyCalc 4.0
BLR-01 GROVES	0.2 MMBtu/hr TEG Dehydrator Reboiler	EPA AP-42 Emission Factors

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

Emission Unit	Pollutant	Control Device	Control Efficiency
225 hp Caterpillar G342NA RICE w/ NSCR (CE-01)	Nitrogen Oxides	NSCR	99.2 %
	Carbon Monoxide		85.4 %
	Volatile Organic Compounds		25.3 %
	Formaldehyde		76 %
625 hp Caterpillar G398TA RICE w/ NSCR (CE-02)	Nitrogen Oxides	NSCR	94.9 %
	Carbon Monoxide		95.3 %
	Volatile Organic Compounds		78.7 %
	Formaldehyde		76 %
3,550 hp Caterpillar G3612LE RICE w/ SCR (CE-03 – CE-05)	Carbon Monoxide		90 %
	Volatile Organic Compounds		60 %
	Formaldehyde		85 %
5 mmscfd TEG Dehydrator Still Vent (DH-01) GROVES	Volatile Organic Compounds	Combustion Recycle	32.8 %
	Hazardous Air Pollutants		6 %
	Greenhouse Gas		49.6 %

The total facility wide emissions after this proposed modification (including Groves Facility) are shown in the following table:

Pollutant	Maximum Pre-Modification Annual Facility Wide Emissions (tons/year)	Maximum Post-Modification Annual Facility Wide Emissions (tons/year)	Net Facility Wide Emissions Changes (tons/year)
Nitrogen Oxides	80.70	91.25	10.55
Carbon Monoxide	61.13	86.14	25.01
Volatile Organic Compounds	86.54	153.61	67.07
Particulate Matter-10/2.5	6.15	6.96	0.81
Sulfur Dioxide	0.39	0.45	0.06
Formaldehyde	3.92	4.54	0.62
Total HAPs	17.97	21.78	3.81
Carbon Dioxide Equivalent	98,418	120,553	22,135

Maximum detailed controlled facility wide emissions were calculated by Williams and checked for accuracy by the writer and are summarized in the table on the next page.

Williams Ohio Valley Midstream LLC – Fort Beeler Facility (R13-2826H)

Emission	Source	NO_x		CO		VOC		PM-10/2.5		SO_2		Formaldehyde		Total HAPs		CO_2e
Unit 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	lb/hr	ton/year	ton/year
CE-01	Cat G342NA Engine	0.05	0.22	0.99	4.35	0.28	1.22	0.04	0.18	<0.01	<0.01	0.03	0.13	0.05	0.24	1191
CE-02	Cat G398TA Engine	0.69	3.02	0.69	3.04	0.09	0.39	0.11	0.49	<0.01	0.01	0.03	0.14	0.05	0.20	3117
CE-03	Cat G3612LE Engine	3.91	17.14	2.15	9.43	2.85	12.48	0.26	1.14	0.02	0.07	0.31	1.34	0.56	2.44	19813
CE-04	Cat G3612LE Engine	3.91	17.14	2.15	9.43	2.85	12.48	0.26	1.14	0.02	0.07	0.31	1.34	0.56	2.44	19813
CE-05	Cat G3612LE Engine	3.91	17.14	2.15	9.43	2.85	12.48	0.26	1.14	0.02	0.07	0.31	1.34	0.56	2.44	19813
SSM	Startup, Shutdown, Main	-	-	-	-	NA	11.00	-	-	-	-	-	-	NA	1.16	4112
RPC	Rod Packing/Crankcase	-	-	-	-	2.97	13.00	-	-	-	-	0.05	0.22	0.34	1.50	4717
GE-01	Emergency Generator	0.93	0.23	29.10	7.28	0.38	0.10	0.03	<0.01	<0.01	<0.01	0.03	0.01	0.05	0.01	42
H-01	TXP1 Hot Oil Heater	1.09	4.76	0.91	4.00	0.06	0.26	0.08	0.36	<0.01	0.03	<0.01	<0.01	0.02	0.09	5686
H-02	TXP1 Regen Gas Heater	0.52	2.26	0.43	1.90	0.03	0.12	0.04	0.17	<0.01	0.01	<0.01	<0.01	<0.01	0.04	2695
H-03	TXP2 Regen Gas Heater	0.72	3.14	0.60	2.64	0.04	0.17	0.05	0.24	<0.01	0.02	<0.01	<0.01	0.01	0.06	3753
H-04	TXP2 Regen Gas Heater	0.72	3.14	0.60	2.64	0.04	0.17	0.05	0.24	<0.01	0.02	<0.01	<0.01	0.01	0.06	3753
H-05	TXP2 Medium Heater	2.31	10.10	1.94	8.49	0.13	0.56	0.18	0.77	0.02	0.06	<0.01	<0.01	0.04	0.19	12067
H-06	TXP2 Medium Heater	2.31	10.10	1.94	8.49	0.13	0.56	0.18	0.77	0.02	0.06	<0.01	<0.01	0.04	0.19	12067
FL-01	Old Process Flare	16.32	0.19	88.80	1.04	7.47	0.09	1.79	0.02	0.14	<0.01	-	-	1.07	0.01	392
FL-02	New Process Flare	36.85	2.56	200.51	13.94	127.79	8.88	4.04	0.28	0.32	0.02	-	-	21.30	1.48	5158
TLO	Truck Loadout	-	-	-	-	NA	1.96	-	-	-	-	-	-	NA	0.49	-
T-03	Produced Water Tank	-	-	-	-	0.23	1.01	-	-	-	-	-	-	0.06	0.25	-
T-04	Produced Water Tank	-	-	-	-	0.23	1.01	-	-	-	-	-	-	0.06	0.25	-
Total Point Source	**Fort Beeler**	**74.23**	**91.15**	**332.98**	**86.06**	**148.40**	**77.93**	**7.37**	**6.96**	**0.56**	**0.45**	**1.07**	**4.54**	**24.79**	**13.57**	**118189**
Fugitive	Process Piping Fugitives	-	-	-	-	13.39	58.67	-	-	-	-	-	-	0.45	1.99	1689
Total Fugitive	**Fort Beeler**	**0.00**	**0.00**	**0.00**	**0.00**	**13.39**	**58.67**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.45**	**1.99**	**1689**
Total Sitewide	**Fort Beeler**	**74.23**	**91.15**	**332.98**	**86.06**	**161.79**	**136.60**	**7.37**	**6.96**	**0.56**	**0.45**	**1.07**	**4.54**	**25.24**	**15.56**	**119878**
Groves Facility																
DH-01	TEG Dehydrator Still Ve	-	-	-	-	3.88	17.00	-	-	-	-	-	-	1.42	6.22	562
BLR-01	Dehydrator Reboiler	0.02	0.10	0.02	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	114
Total Aggregated Source		**74.25**	**91.25**	**333.00**	**86.14**	**165.67**	**153.61**	**7.37**	**6.96**	**0.56**	**0.45**	**1.07**	**4.54**	**26.66**	**21.78**	**120553**

REGULATORY APPLICABILITY

Applicable rules associated with this permit application are the following:

The following rules apply to the facility:

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

The process heaters (H-01 – H06) have been determined to meet the definition of a "fuel burning unit" under 45CSR2 and are, therefore, subject to the applicable requirements therein. Each substantive 45CSR2 requirement is discussed below.

45CSR2 Opacity Standard - Section 3.1

Pursuant to 45CSR2, Section 3.1, all process heaters are subject to an opacity limit of 10%. Proper maintenance and operation of the heaters (and the use of natural gas as fuel) should keep the opacity of the units well below 10% during normal operations.

45CSR2 Weight Emission Standard - Section 4.1.b

Pursuant to the exemption given under §45-2-11, as the post-modification MDHI of H02, H03, H04 are each individually less than 10 mmBtu/hr, these units are not subject to sections 4, 5, 6, 8 and 9 of 45CSR2.

The allowable particulate matter (non-condensable total PM) emission rate for the process heaters with an MDHI ≥ 10 mmBtu/hr (H01, H05, H06), identified as Type "b" fuel burning units, per 45CSR2, Section 4.1.a, is the product of 0.09 and the "total design heat inputs" of the heaters in million Btu per hour. Pursuant to §45-2-2.13.b: "Total Design Heat Input (TDHI)" means the sum of the design heat inputs for all similar units located at one plant. The maximum aggregate total design heat inputs (short-term) of the applicable heaters are 52.44 mmBtu/hr. Using the above equation, the 45CSR2 facility-wide PM emission limit of the applicable heaters is 4.72 lb/hr. The aggregate maximum potential hourly PM emissions (including condensables) from the applicable heaters is estimated to be 0.39 lb/hr. This emission rate is 8.26% of the 45CSR2 limit.

45CSR2 Control of Fugitive Particulate Matter- Section 5

Section 5 of 45CSR2 requires a fugitive particulate matter control system for any source of fugitive particulate matter associated with the fuel burning units. Using natural gas as the fuel of the applicable heaters will result in no substantive potential for fugitive emissions.

45CSR2 Testing, Monitoring, Record-keeping, & Reporting (TMR&R) - Section 8

Section 8 of Rule 2 requires testing for initial compliance with the limits therein, monitoring for continued compliance, and keeping records of that compliance. The TMR&R requirements are clarified under 45CSR2A and discussed below.

45CSR2A Applicability - Section 3

Pursuant to §45-2A-3, as individual applicable "fuel burning units" under 45CSR2 with an MDHI less than 100 mmBtu/hr, the process heaters are not subject to the Testing and MRR Requirements under 45CSR2A.

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

Williams uses flares to safely combust natural gas and natural gas liquids (NGL) during *routine* depressurization of portions of the plant for maintenance purposes. The flares (FL-01, FL-02) meet the definition of an "incinerator" under 45CSR6 and are, therefore, subject to the requirements therein. The substantive requirements applicable to the flares are discussed below.

45CSR6 Emission Standards for Incinerators - Section 4.1

Section 4.1 limits PM emissions from incinerators to a value determined by the following formula:

Emissions (lb/hr) = F x Incinerator Capacity (tons/hr)

Where, the factor, F, is as indicated in Table I below:

Table I: Factor, F, for Determining Maximum Allowable Particulate Emissions

Incinerator Capacity	Factor F
A. Less than 15,000 lbs/hr	5.43
B. 15,000 lbs/hr or greater	2.72

FL-01

Based on: (1) the flare's maximum heat input rating of 240 mmBtu/hr a, (2) the worst-case HHV of the waste gas of 2,516 Btu/scf, and (3) the inlet gas mass of 54,990 lb/mmscf (taken from the gas analysis), the maximum flare capacity can be calculated to be 5,245 lb/hr (or 2.62 tons/hour). Based on this calculated flare capacity, the particulate matter emission limit given under the above equation is 14.22 lb/hr. The worst-case particulate matter rate from the flare was calculated to be 1.79 lb/hr, or 12.59% of the Rule 6 emission limit.

FL-02

Based on the flare's maximum capacity from the manufacturer, the capacity is 383,000 lb/hr (191.5 tons/hour). Based on this, the particulate matter emission limit given under the above equation is 520.88 lb/hr. The worst-case particulate matter rate from the flare was calculated to be 4.04 lb/hr, or less than 1% of the Rule 6 emission limit.

45CSR6 Opacity Limits for - Section 4.3, 4.4

Pursuant to Section 4.3, and subject to the exemptions under 4.4, the flares have a 20% limit on opacity during operation. The existing permit, under 9.1.3., essentially mandates the flare to meet the flare requirements under 40 CFR §60.18 - which requires much more stringent opacity requirements (no visible emissions, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours). Therefore, compliance with 9.1.3. of the permit will show compliance with the opacity requirements under 45CSR6.

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

45CSR10 has requirements limiting SO_2 emissions from "fuel burning units," limiting in-stack SO_2 concentrations of "manufacturing processes," and limiting H_2S concentrations in process gas streams. The process heaters (H-01 – H-06) are each defined as a "fuel burning unit" and subject to the applicable requirements discussed below.

45CSR10 Fuel Burning Units - Section 3

Pursuant to the exemption given under §45-10-10.1, as the post-modification MDHI of H02, H-03, H-04 are each individually less than 10 mmBtu/hr, these units are not subject to section 3 of 45CSR10.

The allowable SO_2 emission rate for the process heaters with an MDHI $\geq$ 10 mmBtu/hr (H01, H05, H06), identified as Type "b" fuel burning units, per 45CSR10, Section 3.2(c), is the product of 1.6 and the total design heat input of the applicable heaters in million Btu per hour. The maximum aggregate total design heat input (short-term) of the applicable heaters is 52.44 mmBtu/hr. Using the above equation, the 45CSR10 facility-wide SO_2 emission limit of the applicable heaters is 83.90 lb/hr. The maximum potential hourly SO_2 emissions from the applicable heaters is estimated to be 0.02 lb/hr. This emission rate is only a trace of the 45CSR10 limit.

45CSR10 Testing, Monitoring, Record-keeping, & Reporting (TMR&R) - Section 8

Section 8 of Rule 10 requires to test for initial compliance with the limits therein, monitor for continued compliance, and keep records of that compliance. The TMR&R requirements are clarified under 45CSR10A and discussed below.

45CSR10A Applicability - Section 3

Pursuant to §45-10A-3.1(b), as the applicable process heaters "combust natural gas, wood or distillate oil, alone or in combination," the heaters are not subject to the Testing and MRR Requirements under 45CSR10A.

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)

The proposed modifications at the existing Fort Beeler Compressor Station have the potential to emit a regulated pollutant (VOC) in excess of six (6) lbs/hour and ten (10) TPY that would, pursuant to §45-13-2.17, define the installation as a "modification" under 45CSR13. Pursuant to §45-13-5.1, "[n]o person shall cause, suffer, allow or permit the modification . . . and operation of any stationary source to be commenced without . . . obtaining a permit to construct. Williams has published the required Class I legal advertisement notifying the public of their permit application, and paid the appropriate application fee (modification).

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

45CSR16 applies to this source by reference of, 40CFR60, Subparts Dc, KKK, JJJJ and OOOO.

45CSR30 (Requirements for Operating Permits)

45CSR30 provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act. The Fort Beeler Facility meets the definition of a "major source under § 112 of the Clean Air Act" as outlined under §45-30-2.26 and clarified (fugitive policy) under 45CSR30b. Additionally, the facility has process heaters subject to a New Source Performance Standard (NSPS) - 40 CFR 60, Subpart Dc and cryogenic plants subject to 40 CFR 60, Subpart KKK- the facility is subject to Title V.

40CFR60 Subpart Dc (Standards of Performance for Small Industrial/Commercial/Institutional Steam Generating Units)

The process heaters with a MDHI $\geq$ 10 mmBtu/hr (H-01, H05, H06) are subject to 40 CFR 60, Subpart Dc under the applicability requirements of §60.40c(a). Subpart Dc does not have any emission standards for combusting only natural gas. However, the applicable heaters are subject to the recordkeeping and reporting requirements given under §60.48c.

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

40CFR60 Subpart JJJJ establishes emission standards for applicable SI ICE.

The 118 hp Olympian G70LG emergency generator (GE-01) was manufactured after the July 1, 2009 date for emergency engines. The engine is subject to the emission standards in 60.4233 (c) or 60.4233 (3) dependent upon whether natural gas or propane is used as fuel.

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

Subpart KKK applies to onshore natural gas processing plants that commenced construction after January 20, 1984 and on or before August 23, 2011. The Fort Beeler Station is a natural gas processing plant. Therefore, Leak Detection and Repair (LDAR) requirements for onshore natural gas processing plants would apply. Due to the applicability dates, processing trains TXP1 and TXP2 are subject to the LDAR requirements of this section. The Inlet and TXP3 are subject to the LDAR requirements of 40CFR60 Subpart OOOO.

Williams must meet the Leak Detection and Repair (LDAR) requirements of Subpart KKK for processing trains TXP1 and TXP2, which includes the provisions referenced in 40 CFR 60, Subpart VV. Substantively, Subpart VV defines a leak (and triggers repair procedures) when pollutant concentrations are detected in excess of 10,000 ppmv.

40 CFR 60, 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 (SO_2) 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:
Each gas well affected facility, which is a single natural gas well.

There are no gas wells at this facility. Therefore, all requirements regarding gas well affected facilities under 40 CFR 60 Subpart OOOO would not apply.

a. 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 Fort Beeler Station. Therefore, all requirements regarding centrifugal compressors under 40 CFR 60 Subpart OOOO would not apply.

b. 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 are reciprocating internal combustion engines located at the Fort Beeler Station that were constructed after August 23, 2011. Therefore, the requirements regarding reciprocating compressors under 40 CFR 60 Subpart OOOO would apply. Williams would be required to perform the following:

- Replace the reciprocating compressor rod packing at least every 26,000 hours of operation or 36 months.
- Demonstrate initial compliance by continuously monitoring the number of hours of operation or track the number of months since the last rod packing replacement.
- Submit the appropriate start up notifications.
- Submit the initial annual report for the reciprocating compressors.
- Maintain records of hours of operation since last rod packing replacement, records of the date and time of each rod packing replacement, and records of deviations in cases where the reciprocating compressor was not operated in compliance.

c. 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.

All pneumatic controllers at the facility will be air driven. Therefore, there are no applicable pneumatic controllers which commenced construction after August 23, 2011. Therefore, all requirements regarding pneumatic controllers under 40 CFR 60 Subpart OOOO would not apply.

d. 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 non-earthen 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 Fort Beeler Station have a potential to emit to less than 6 tpy of VOC. Therefore, Williams is not required by this section to further reduce VOC emissions by 95%.

e. 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 Fort Beeler Station is a natural gas processing plant. Therefore, Leak Detection and Repair (LDAR) requirements for onshore natural gas processing plants would apply. Due to the applicability dates, the Inlet and TXP3 processing train are subject to the LDAR requirements of this section. Processing trains TXP1 and TXP2 are subject to the LDAR requirements of 40CFR60 Subpart KKK.

Williams must meet the Leak Detection and Repair (LDAR) requirements of Subpart OOOO for the Inlet and processing train TXP3, which includes the provisions referenced in 40 CFR 60, Subpart VVa. Substantively, Subpart VVa defines a leak (and triggers repair procedures) when pollutant concentrations are detected in excess of 500 ppmv.

f. 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 (H_2S) 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 Fort Beeler Station. Therefore, all requirements regarding sweetening units under 40 CFR 60 Subpart OOOO would not apply.

40CFR63 Subpart HH (National Emission Standards for Hazardous Air Pollutants for Oil and Natural Gas Production Facilities)

Subpart HH establishes national emission limitations and operating limitations for HAPs emitted from oil and natural gas production facilities located at major and area sources of HAP emissions. The glycol dehydration unit is at the co-located Groves Facility. Therefore, this unit will be permitted under a separate permit. However, because the facility is an area source of HAP emissions and the actual average benzene emissions from the glycol dehydration unit is below 0.90 megagram per year (1.0 tons/year) it is exempt from all requirements of Subpart HH except to maintain records of actual average flowrate of natural gas to demonstrate a continuous exemption status.

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

Subpart ZZZZ establishes national emission limitations and operating limitations for HAPs emitted from stationary 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.

The applicability requirements for new stationary RICEs located at an area source of HAPs, is the requirement to meet the standards of 40CFR60 Subpart JJJJ. These requirements were outlined above. The proposed engine meets these standards.

The determination that each engine at Fort Beeler meets the definition of "remote stationary RICE" is based on the Department of Transportation (DOT) pipeline classification. 49 CFR Part 192 defines various class locations and the pipeline segment at Fort Beeler meets the definition of Class I. Class I is "any class location until that has 10 or fewer buildings intended for human occupancy" and a class location unit is "any onshore area that extends 220 yards on either side of the centerline of any continuous 1 mile length of pipeline". Williams provided a map as part of Permit Application R13-2826H to substantiate this status.

The following rules do not apply to the facility:

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 largest tanks that Williams has proposed to install are smaller. Therefore, Williams 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)

On September 30, 2013, EPA approved a redesignation request and State Implementation Plan (SIP) revision submitted by the State of West Virginia. The West Virginia Department of Environmental Protection (WVDEP) requested that the West Virginia portion of the Wheeling, WV–OH fine particulate matter ($PM_{2.5}$) nonattainment area (''Wheeling Area'' or ''Area'') be redesignated as attainment for the 1997 annual $PM_{2.5}$ national ambient air quality standard (NAAQS).

The Fort Beeler facility is located in Marshall County, which is located in this metropolitan statistical area and is an attainment county for all pollutants. Therefore the Fort Beeler Facility is not subject to 45CSR19.

As shown in the following table, Williams is not a major source subject to 45CSR14 or 45CSR19 review. According to 45CSR14 Section 2.43.e, fugitive emissions are included in the major source determination because it is listed as one of the source categories.

Pollutant	**PSD (45CSR14) Threshold (tpy)**	**NANSR (45CSR19) Threshold (tpy)**	**Fort Beeler & Groves Facility PTE (tpy)**	**45CSR14 or 45CSR19 Review Required?**
Carbon Monoxide	250	NA	86.14	No
Nitrogen Oxides	250	NA	91.25	No
Sulfur Dioxide	250	NA	0.45	No
Particulate Matter 10	250	NA	6.96	No
Ozone (VOC)	250	NA	153.61	No

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

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the Fort Beeler Gas Processing Plant and that are not classified as "criteria pollutants." Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NO_x), Ozone, Particulate Matter (PM), Particulate Matter less than 10 microns (PM_{10}), Particulate Matter less than 2.5 microns ($PM_{2.5}$), and Sulfur Dioxide (SO_2). These pollutants have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect the public health and welfare. Other pollutants of concern, although designated as non-criteria and without national concentration standards, are regulated through various federal and programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) limits promulgated under 40 CFR 61 (NESHAPS) and 40 CFR 63 (MACT). Any potential applicability to these programs were discussed above under REGULATORY APPLICABILITY.

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. The modifications evaluated herein result in a quantifiable increase in two speciated HAPs: Hexane and Benzene. The following table lists each HAP's carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

Table 5: HAPs - Carcinogenic Risk

HAPs	Type	Known/Suspected Carcinogen	Classification
Hexane	VOC	No	Inadequate Data
Benzene	VOC	Yes	Category A - Known Human Carcinogen

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health affects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals*. For a complete discussion of the known health effects of each compound refer to the IRIS database located at *www.epa.gov/iris*.

AIR QUALITY IMPACT ANALYSIS

The proposed modification does not meet the definition of a "major modification" pursuant to 45CSR14 or 45CSR19 and, therefore, an air quality impact (computer modeling) analysis was not required. Additionally, based on the nature of the proposed modification, modeling was not required under 45CSR13, Section 7.

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.

- The Fort Beeler Processing Facility will operate under SIC code 1321 (Natural Gas Liquid Extraction), while upstream Williams' facilities also operate under SIC Code 1321. Therefore, the facilities do belong to the same industrial grouping.

- Williams operates under their parent company, The Williams Companies, Inc. and is the sole operator of the Fort Beeler Processing Facility. The production wells, including the TransEnergy Wellpad, that send natural gas to Fort Beeler are owned and operated by other companies. Williams has no ownership stake in any well that may send gas to Fort Beeler. Williams has no operational control over any equipment owned or operated by any natural gas producer upstream of Fort Beeler. All employees at Fort Beeler are under the exclusive direction of Williams and have no reporting authority to any other entity. In addition, no work forces are shared between the different companies. Contracts are in place for Fort Beeler to handle gas from the aforementioned wells. However, Fort Beeler will potentially receive gas from other producers in the future. Futuristically, Williams will not have ownership or control of future wellhead activities. The producers are and will be responsible for any decisions to produce or shut-in wellhead facilities and no control over the equipment installed, owned, and operated by Williams. Therefore, these facilities are not under common control.

- "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 Fort Beeler facility processes gas produced from multiple upstream production wells located in northern West Virginia and eastern Ohio. Fort Beeler is located on a parcel that is directly adjacent to a single upstream wellpad owned by TransEnergy and is located less than 0.5 mile from that wellpad. Other upstream production wells are located further from the facility. 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. However, Williams' Groves Facility is co-

located with the Fort Beeler facility and meets all three (3) prongs to be considered the same "Building, structure, facility, or installation". Therefore, the emissions from this facility have been aggregated with Fort Beeler in determining major source or PSD status.

CHANGES TO PERMIT R13-2826G

- Add new process flare (FL-02).
- Remove condensate stabilizer heater.
- Remove run time restrictions on Caterpillar G3612LE engines (CE-03, CE-04, CE-05).
- Remove run time restrictions on TXP-2/TXP-3 regen gas heaters (H-03, H-04).
- Add new emergency generator engine (GE-01).
- Incorporate improved emission estimating protocols.

MONITORING OF OPERATIONS

Williams will be required to perform the following monitoring and recordkeeping:

- Monitor and record quantity of natural gas consumed for all engines, and combustion sources.
- Monitor all applicable requirements of 40CFR60 Subparts Dc, KKK, JJJJ, and OOOO, and 40CFR63 Subparts HH and ZZZZ.
- Monitor and record the operating hours of the flares.
- Monitor the presence of the flare pilot flames using a thermocouple or any other equivalent device to detect the presence of a flame at the flare.
- Monitor and record the actual average flowrate of natural gas to the glycol dehydration unit to demonstrate a continuous exemption status.
- 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
- Maintain records of the visible emission opacity tests conducted per the permit.
- 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.
- The records shall be maintained on site or in a readily available off-site location maintained by Williams for a period of five (5) years.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that compliance with all applicable regulations will be achieved. Therefore, I recommend to the Director the issuance of Permit R13-2826H to Williams Ohio Valley Midstream for the modifications discussed above at the Fort Beeler Gas Processing Facility located near Cameron, Marshall County, WV.

Jerry Williams, P.E.
Engineer

Oct. 15, 2014
Date