Permit / Application Information Sheet
Division of Environmental Protection
West Virginia Office of Air Quality

Company:	Williams Ohio Valley Midstream, LLC	**Facility:**	Oak Grove Plant
Region:	1 **Plant ID:** 051-00157	**Application #:**	13-3289
Engineer:	Kessler, Joe	**Category:**	
Physical Address:	Fork Ridge Road Moundsville WV 26041	**SIC:** [2819] CHEMICALS AND ALLIED PRODUCTS - INDUSTRIAL INORGANIC CHEMICALS **NAICS:** [211112] Natural Gas Liquid Extraction **SIC:** [1311] OIL AND GAS EXTRACTION - CRUDE PETROLEUM & NATURAL GAS **NAICS:** [211111] Crude Petroleum and Natural Gas Extraction	
County:	Marshall	**SIC:** [1382] OIL AND GAS EXTRACTION - OIL AND GAS EXPLORATION SERVICE **NAICS:** [213112] Support Activities for Oil and Gas Operations	
Other Parties:	ENV_CONT - Baldauff, Erika 304-843-4559 Gen_Mgr - Hunter, Paul 412-787-5561		

Information Needed for Database and AIRS
1. Need valid physical West Virginia address with zip

Regulated Pollutants

CO	Carbon Monoxide	196.550 TPY
PM10	Particulate Matter < 10 um	11.180 TPY
SO2	Sulfur Dioxide	0.800 TPY
VOC	Volatile Organic Compounds (Reactive organic gases)	142.540 TPY
PM2.5	Particulate Matter < 2.5 um	11.180 TPY
PT	Total Particulate Matter	11.180 TPY
VHAP	VOLATILE ORGANIC HAZARDOUS AIR POLLUTANT	16.660 TPY
NOX	Nitrogen Oxides (including NO, NO2, NO3, N2O3, N2O4, and N2O5)	127.920 TPY

Summary from this Permit 13-3289

Air Programs — **Applicable Regulations**
NSPS
TITLE V
Title V/Major

Fee Program	Fee	Application Type
9M	$2,000.00	MODIFICATION

Notes from Database
Permit Note: Permit Application for construction of a small (1) engine compressor station at the existing Oak Grove Gas Plant. This source is considered one source with the Oak Grove facility but, per request from Williams, is permitted with a seperate number.

Activity Dates

APPLICATION RECIEVED	12/23/2015
APPLICATION FEE PAID	12/29/2015
ASSIGNED DATE	12/29/2015
APPLICANT PUBLISHED LEGAL AD	12/29/2015
APPLICATION DEEMED COMPLETE	01/21/2016

~~SANDIE~~
NOTICE

NON-CONFIDENTIAL

Please note, this information sheet is not a substitute for file research and is limited to data entered into the AIRTRAX database.

Company ID: 051-00157
Company: Williams Ohio Valley Midstream
Printed: 02/25/2016
Engineer: Kessler, Joe

IPR FILE INDEX

Applicant : Williams Ohio Valley Midstream
Facility : Francis Compressor Station
Plant ID No.: 051-00157
R13-3289

Chronological Order - Add Index Pages As Necessary

Date	To	From	Subject	# of pages
12/29/15	OVM	Sandra Adkins	48-Hour Letter	
12/31/15	Joe Kessler	OVM	Affidavit of Publication	
1/21/16	OVM	Joe Kessler	Completeness Determination	
3/8/16	Joe Kessler	OVM	Revised Application	
3/8/16	File	Joe Kessler	DAQ/OVM E-mails	
3/8/16	File	Joe Kessler	Draft Permit R13-3289, Fact Sheet/Evaluation	
3/8/16	File	Joe Kessler	Public Notice Documents	

JRK
3/8/2016

AIR QUALITY PERMIT NOTICE

Notice of Intent to Approve

On December 23, 2015, Williams Ohio Valley Midstream LLC applied to the WV Department of Environmental Protection, Division of Air Quality (DAQ) for a permit to construct the Francis Compressor Station (adjacent to the Oak Grove Natural Gas Processing Facility) located at 5258 Fork Ridge Road, near Moundsville, Marshall County, WV at latitude 39.87580 and longitude -80.69590. A preliminary evaluation has determined that all State and Federal air quality requirements will be met by the proposed facility. The DAQ is providing notice to the public of its preliminary determination to issue the permit as R13-3289.

The following potential emissions will be authorized by this permit action: Particulate Matter less than 2.5 microns, 0.49 tons per year (TPY); Particulate Matter less than 10 microns, 0.49 TPY; Particulate Matter, 0.49 TPY; Sulfur Dioxide, 0.03 TPY; Oxides of Nitrogen, 6.66 TPY; Carbon Monoxide, 3.89 TPY; Volatile Organic Compounds, 30.19 TPY; Hazardous Air Pollutants, 2.48 TPY.

Written comments or requests for a public meeting must be received by the DAQ before 5:00 p.m. on XXXXX. A public meeting may be held if the Director of the DAQ determines that significant public interest has been expressed, in writing, or when the Director deems it appropriate.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed construction will meet all State and Federal air quality requirements. The purpose of the public review process is to accept public comments on air quality issues relevant to this determination. Only written comments received at the address noted below within the specified time frame, or comments presented orally at a scheduled public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

Joe Kessler, PE
WV Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
Telephone: 304/926-0499, ext. 1219
FAX: 304/926-0478

Additional information, including copies of the draft permit, application and all other supporting materials relevant to the permit decision may be obtained by contacting the engineer listed above. The draft permit and engineering evaluation can be downloaded at:

www.dep.wv.gov/daq/Pages/NSRPermitsforReview.aspx

Kessler, Joseph R

From: Adkins, Sandra K
Sent: Tuesday, March 08, 2016 1:26 PM
To: 'wentworth.paul@epa.gov'; 'bradley.megan@epa.gov'; erika.baldauff@williams.com
Cc: Durham, William F; McKeone, Beverly D; McCumbers, Carrie; Hammonds, Stephanie E; Rice, Jennifer L; Taylor, Danielle R; Kessler, Joseph R; Seevers, Sharon M
Subject: WV Draft Permit R13-3289 for Williams Ohio Valley Midstream LLC; Francis Compressor Station
Attachments: 3289.pdf; Eval3289.pdf; AttachmentA.pdf; notice.pdf

Please find attached the Draft Permit R13-3289, Engineering Evaluation, Attachment A, and Public Notice for Williams Ohio Valley Midstream LLC's Francis Compressor Station to be located in Marshall County.

The notice will be published in the *Moundsville Daily Echo* on Friday, March 11, 2016, and the thirty day public comment period will end on Monday, April 11, 2016.

Should you have any questions or comments, please contact the permit writer, Joe Kessler, at 304 926-0499 x1219.

Kessler, Joseph R

From: Adkins, Sandra K
Sent: Tuesday, March 08, 2016 1:26 PM
To: Wheeler, Cathy L
Cc: Kessler, Joseph R
Subject: DAQ Public Notice

Please see below the Public Notice for Draft Permit R13-3289 for Williams Ohio Valley Midstream LLC's Francis Compressor Station to be located in Marshall County.

The notice will be published in the *Moundsville Daily Echo* on Friday, March 11, 2016, and the thirty day public comment period will end on Monday, April 11, 2016.

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Written comments or requests for a public meeting must be received by the DAQ before 5:00 p.m. on Monday, April 11, 2016. A public meeting may be held if the Director of the DAQ determines that significant public interest has been expressed, in writing, or when the Director deems it appropriate.

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Kessler, Joseph R

From: Adkins, Sandra K
Sent: Tuesday, March 08, 2016 1:26 PM
To: Charles Walton
Cc: Kessler, Joseph R
Subject: RE: Publication of Class I Legal Ad for the WV Division of Air Quality

Thank you!

From: Charles Walton [mailto:mdsvecho@gmail.com]
Sent: Tuesday, March 08, 2016 12:54 PM
To: Adkins, Sandra K <Sandra.K.Adkins@wv.gov>
Subject: Re: Publication of Class I Legal Ad for the WV Division of Air Quality

received. will publish on date requested. Melanie

On Tue, Mar 8, 2016 at 12:30 PM, Adkins, Sandra K <Sandra.K.Adkins@wv.gov> wrote:

Please publish the information below as a Class I legal advertisement (one time only) in the Friday, March 11, 2016, issue of the *Moundsville Daily Echo*. Please let me know that this has been received and will be published as requested. Thank you.

Send the invoice for payment and affidavit of publication to:

Sandra Adkins

WV Department of Environmental Protection

DIVISION OF AIR QUALITY

601- 57th Street

Charleston, WV 25304

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Kessler, Joseph R

From: Adkins, Sandra K
Sent: Tuesday, March 08, 2016 12:31 PM
To: Charles Walton
Cc: Kessler, Joseph R
Subject: Publication of Class I Legal Ad for the WV Division of Air Quality

Please publish the information below as a Class I legal advertisement (one time only) in the Friday, March 11, 2016, issue of the *Moundsville Daily Echo*. Please let me know that this has been received and will be published as requested. Thank you.

Send the invoice for payment and affidavit of publication to:

Sandra Adkins
WV Department of Environmental Protection
DIVISION OF AIR QUALITY
601- 57th Street
Charleston, WV 25304

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West Virginia Department of Environmental Protection
Division of Air Quality

Earl Ray Tomblin
Governor

Randy C. Huffman
Cabinet Secretary

Permit to Construct

R13-3289

This permit is issued in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§ 22-5-1 et seq.) and 45 C.S.R. 13 — Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation. The permittee identified at the facility listed below is authorized to construct the stationary sources of air pollutants identified herein in accordance with all terms and conditions of this permit.

Issued to:

Williams Ohio Valley Midstream LLC
Francis Compressor Station
051-00157

DRAFT

William F. Durham
Director

Issued: DRAFT

Facility Location:	Moundsville, Marshall County, West Virginia
Mailing Address:	100 Teletech Dr., STE 2, Moundsville, WV 26041
Facility Description:	Compressor Station
SIC/NAICS Codes:	1389/213112
UTM Coordinates:	526.243 km Easting • 4,413.806 km Northing • Zone 17
Latitude/Longitude:	39.87580/-80.69590
Permit Type:	Conatruction
Desc. of Change:	Construction of a natural gas compressor station at the existing Oak Grove Natural Gas Processing Facility. This facility is considered "one-source" with the Oak Grove Natural Gas Processing Facility.

Any person whose interest may be affected, including, but not necessarily limited to, the applicant and any person who participated in the public comment process, by a permit issued, modified or denied by the Secretary may appeal such action of the Secretary to the Air Quality Board pursuant to article one [§§ 22B-1-1 et seq.], Chapter 22B of the Code of West Virginia. West Virginia Code §22-5-14.

The source (Oak Grove Natural Gas Processing Facility) is subject to 45CSR30. Changes authorized by this permit must also be incorporated into the facility's Title V permit application or operating permit. Commencement date of any operation authorized by this permit shall be determined by the appropriate timing limitations associated with Title V permit revisions per 45CSR30.

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1.0 Emission Units

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device[1]
CE-01	22E	Caterpillar G3616 4-Stroke Lean Burn (4SLB) Compressor Engine	TBD	1,380 hp	OxCat (1-OXCAT)
RPC-3	23E	Rod Packing/Crankcase Leaks	TBD	n/a	n/a
SSM-2	24E	Start/Stop/Maintenance (i.e., Engine Blowdowns)	TBD	n/a	n/a
FUG-3	25E	Piping and Equipment Fugitives - Gas	TBD	n/a	n/a

(1) OxCat = Oxidation Catalyst

2.0. General Conditions

2.1. Definitions

2.1.1. All references to the "West Virginia Air Pollution Control Act" or the "Air Pollution Control Act" mean those provisions contained in W.Va. Code §§ 22-5-1 to 22-5-18.

2.1.2. The "Clean Air Act" means those provisions contained in 42 U.S.C. §§ 7401 to 7671q, and regulations promulgated thereunder.

2.1.3. "Secretary" means the Secretary of the Department of Environmental Protection or such other person to whom the Secretary has delegated authority or duties pursuant to W.Va. Code §§ 22-1-6 or 22-1-8 (45 CSR § 30-2.12.). The Director of the Division of Air Quality is the Secretary's designated representative for the purposes of this permit.

2.2. Acronyms

CAAA	Clean Air Act Amendments	**NO_x**	Nitrogen Oxides
CBI	Confidential Business Information	**NSPS**	New Source Performance Standards
CEM	Continuous Emission Monitor	**PM**	Particulate Matter
CES	Certified Emission Statement	**$PM_{2.5}$**	Particulate Matter less than 2.5μm in diameter
C.F.R. *or* CFR	Code of Federal Regulations		
CO	Carbon Monoxide	**PM_{10}**	Particulate Matter less than 10μm in diameter
C.S.R. *or* CSR	Codes of State Rules		
DAQ	Division of Air Quality	**Ppb**	Pounds per Batch
DEP	Department of Environmental Protection	**pph**	Pounds per Hour
		ppm	Parts per Million
dscm	Dry Standard Cubic Meter	**Ppmv or ppmv**	Parts per million by volume
FOIA	Freedom of Information Act		
HAP	Hazardous Air Pollutant	**PSD**	Prevention of Significant Deterioration
HON	Hazardous Organic NESHAP		
HP	Horsepower	**psi**	Pounds per Square Inch
lbs/hr	Pounds per Hour	**SIC**	Standard Industrial Classification
LDAR	Leak Detection and Repair		
M	Thousand	**SIP**	State Implementation Plan
MACT	Maximum Achievable Control Technology	**SO_2**	Sulfur Dioxide
		TAP	Toxic Air Pollutant
MDHI	Maximum Design Heat Input	**TPY**	Tons per Year
MM	Million	**TRS**	Total Reduced Sulfur
MMBtu/hr *or* mmbtu/hr	Million British Thermal Units per Hour	**TSP**	Total Suspended Particulate
		USEPA	United States Environmental Protection Agency
MMCF/hr *or* mmcf/hr	Million Cubic Feet per Hour	**UTM**	Universal Transverse Mercator
NA	Not Applicable		
NAAQS	National Ambient Air Quality Standards	**VEE**	Visual Emissions Evaluation
		VOC	Volatile Organic Compounds
NESHAPS	National Emissions Standards for Hazardous Air Pollutants	**VOL**	Volatile Organic Liquids

2.3. Authority

This permit is issued in accordance with West Virginia Air Pollution Control Law W.Va. Code §§22-5-1 et seq. and the following Legislative Rules promulgated thereunder:

2.3.1. 45CSR13 – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation.*

2.4. Term and Renewal

2.4.1. This permit shall remain valid, continuous and in effect unless it is revised, suspended, revoked or otherwise changed under an applicable provision of 45CSR13 or any applicable legislative rule.

2.5. Duty to Comply

2.5.1. The permitted facility shall be constructed and operated in accordance with the plans and specifications filed in Permit Applications R13-3289 and any modifications, administrative updates, or amendments thereto. The Secretary may suspend or revoke a permit if the plans and specifications upon which the approval was based are not adhered to;
[45CSR§§13-5.11 and 13-10.3]

2.5.2. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the West Virginia Code and the Clean Air Act and is grounds for enforcement action by the Secretary or USEPA;

2.5.3. Violations of any of the conditions contained in this permit, or incorporated herein by reference, may subject the permittee to civil and/or criminal penalties for each violation and further action or remedies as provided by West Virginia Code 22-5-6 and 22-5-7;

2.5.4. Approval of this permit does not relieve the permittee herein of the responsibility to apply for and obtain all other permits, licenses and/or approvals from other agencies; i.e., local, state and federal, which may have jurisdiction over the construction and/or operation of the source(s) and/or facility herein permitted.

2.6. Duty to Provide Information

The permittee shall furnish to the Secretary within a reasonable time any information the Secretary may request in writing to determine whether cause exists for administratively updating, modifying, revoking or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Secretary copies of records to be kept by the permittee. For information claimed to be confidential, the permittee shall furnish such records to the Secretary along with a claim of confidentiality in accordance with 45CSR31. If confidential information is to be sent to USEPA, the permittee shall directly provide such information to USEPA along with a claim of confidentiality in accordance with 40 C.F.R. Part 2.

2.7. Duty to Supplement and Correct Information

Upon becoming aware of a failure to submit any relevant facts or a submittal of incorrect information in any permit application, the permittee shall promptly submit to the Secretary such supplemental facts or corrected information.

2.8. Administrative Update

The permittee may request an administrative update to this permit as defined in and according to the procedures specified in 45CSR13.
[45CSR§13-4]

2.9. Permit Modification

The permittee may request a minor modification to this permit as defined in and according to the procedures specified in 45CSR13.
[45CSR§13-5.4.]

2.10. Major Permit Modification

The permittee may request a major modification as defined in and according to the procedures specified in 45CSR14 or 45CSR19, as appropriate.
[45CSR§13-5.1]

2.11. Inspection and Entry

The permittee shall allow any authorized representative of the Secretary, upon the presentation of credentials and other documents as may be required by law, to perform the following:

a. At all reasonable times (including all times in which the facility is in operation) enter upon the permittee's premises where a source is located or emissions related activity is conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times (including all times in which the facility is in operation) any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit;

d. Sample or monitor at reasonable times substances or parameters to determine compliance with the permit or applicable requirements or ascertain the amounts and types of air pollutants discharged.

2.12. Emergency

2.12.1. An "emergency" means any situation arising from sudden and reasonable unforeseeable events beyond the control of the source, including acts of God, which situation requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission

limitation under the permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.

2.12.2. Effect of any emergency. An emergency constitutes an affirmative defense to an action brought for noncompliance with such technology-based emission limitations if the conditions of Section 2.12.3 are not met.

2.12.3. The affirmative defense of emergency shall be demonstrated through properly signed, contemporaneous operating logs, or other relevant evidence that:

a. An emergency occurred and that the permittee can identify the cause(s) of the emergency;

b. The permitted facility was at the time being properly operated;

c. During the period of the emergency the permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards, or other requirements in the permit; and,

d. The permittee submitted notice of the emergency to the Secretary within one (1) working day of the time when emission limitations were exceeded due to the emergency and made a request for variance, and as applicable rules provide. This notice must contain a detailed description of the emergency, any steps taken to mitigate emission, and corrective actions taken.

2.12.4. In any enforcement proceeding, the permittee seeking to establish the occurrence of an emergency has the burden of proof.

2.12.5. The provisions of this section are in addition to any emergency or upset provision contained in any applicable requirement.

2.13. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it should have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. However, nothing in this paragraph shall be construed as precluding consideration of a need to halt or reduce activity as a mitigating factor in determining penalties for noncompliance if the health, safety, or environmental impacts of halting or reducing operations would be more serious than the impacts of continued operations.

2.14. Suspension of Activities

In the event the permittee should deem it necessary to suspend, for a period in excess of sixty (60) consecutive calendar days, the operations authorized by this permit, the permittee shall notify the Secretary, in writing, within two (2) calendar weeks of the passing of the sixtieth (60) day of the suspension period.

2.15. Property Rights

This permit does not convey any property rights of any sort or any exclusive privilege.

2.16. Severability

The provisions of this permit are severable and should any provision(s) be declared by a court of competent jurisdiction to be invalid or unenforceable, all other provisions shall remain in full force and effect.

2.17. Transferability

This permit is transferable in accordance with the requirements outlined in Section 10.1 of 45CSR13. **[45CSR§13-10.1]**

2.18. Notification Requirements

The permittee shall notify the Secretary, in writing, no later than thirty (30) calendar days after the actual startup of the operations authorized under this permit.

2.19. Credible Evidence

Nothing in this permit shall alter or affect the ability of any person to establish compliance with, or a violation of, any applicable requirement through the use of credible evidence to the extent authorized by law. Nothing in this permit shall be construed to waive any defense otherwise available to the permittee including, but not limited to, any challenge to the credible evidence rule in the context of any future proceeding.

3.0. Facility-Wide Requirements

3.1. Limitations and Standards

3.1.1. **Open burning.** The open burning of refuse by any person, firm, corporation, association or public agency is prohibited except as noted in 45CSR§6-3.1.
[45CSR§6-3.1.]

3.1.2. **Open burning exemptions.** The exemptions listed in 45CSR§6-3.1 are subject to the following stipulation: Upon notification by the Secretary, no person shall cause, suffer, allow or permit any form of open burning during existing or predicted periods of atmospheric stagnation. Notification shall be made by such means as the Secretary may deem necessary and feasible.
[45CSR§6-3.2.]

3.1.3. **Asbestos.** The permittee is responsible for thoroughly inspecting the facility, or part of the facility, prior to commencement of demolition or renovation for the presence of asbestos and complying with 40 C.F.R. § 61.145, 40 C.F.R. § 61.148, and 40 C.F.R. § 61.150. The permittee, owner, or operator must notify the Secretary at least ten (10) working days prior to the commencement of any asbestos removal on the forms prescribed by the Secretary if the permittee is subject to the notification requirements of 40 C.F.R. § 61.145(b)(3)(i). The USEPA, the Division of Waste Management and the Bureau for Public Health - Environmental Health require a copy of this notice to be sent to them.
[40CFR§61.145(b) and 45CSR§34]

3.1.4. **Odor.** No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.
[45CSR§4-3.1 State-Enforceable only.]

3.1.5. **Permanent shutdown.** A source which has not operated at least 500 hours in one 12-month period within the previous five (5) year time period may be considered permanently shutdown, unless such source can provide to the Secretary, with reasonable specificity, information to the contrary. All permits may be modified or revoked and/or reapplication or application for new permits may be required for any source determined to be permanently shutdown.
[45CSR§13-10.5.]

3.1.6. **Standby plan for reducing emissions.** When requested by the Secretary, the permittee shall prepare standby plans for reducing the emissions of air pollutants in accordance with the objectives set forth in Tables I, II, and III of 45 C.S.R. 11.
[45CSR§11-5.2.]

3.2. Monitoring Requirements

3.2.1. **Emission Limit Averaging Time.** Unless otherwise specified, compliance with all annual limits shall be based on a rolling twelve month total. A rolling twelve month total shall be the sum of the measured parameter of the previous twelve calendar months.

3.3. Testing Requirements

3.3.1. **Stack testing.** As per provisions set forth in this permit or as otherwise required by the Secretary, in accordance with the West Virginia Code, underlying regulations, permits and orders, the permittee shall conduct test(s) to determine compliance with the emission limitations set forth in this permit and/or established or set forth in underlying documents. The Secretary, or his duly authorized representative, may at his option witness or conduct such test(s). Should the Secretary exercise his option to conduct such test(s), the operator shall provide all necessary sampling connections and sampling ports to be located in such manner as the Secretary may require, power for test equipment and the required safety equipment, such as scaffolding, railings and ladders, to comply with generally accepted good safety practices. Such tests shall be conducted in accordance with the methods and procedures set forth in this permit or as otherwise approved or specified by the Secretary in accordance with the following:

a. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with 40 C.F.R. Parts 60, 61, and 63 in accordance with the Secretary's delegated authority and any established equivalency determination methods which are applicable. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4 or 45CSR§13-5.4 as applicable.

b. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with applicable requirements which do not involve federal delegation. In specifying or approving such alternative testing to the test methods, the Secretary, to the extent possible, shall utilize the same equivalency criteria as would be used in approving such changes under Section 3.3.1.a. of this permit. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4 or 45CSR§13-5.4 as applicable.

c. All periodic tests to determine mass emission limits from or air pollutant concentrations in discharge stacks and such other tests as specified in this permit shall be conducted in accordance with an approved test protocol. Unless previously approved, such protocols shall be submitted to the Secretary in writing at least thirty (30) days prior to any testing and shall contain the information set forth by the Secretary. In addition, the permittee shall notify the Secretary at least fifteen (15) days prior to any testing so the Secretary may have the opportunity to observe such tests. This notification shall include the actual date and time during which the test will be conducted and, if appropriate, verification that the tests will fully conform to a referenced protocol previously approved by the Secretary.

d. The permittee shall submit a report of the results of the stack test within sixty (60) days of completion of the test. The test report shall provide the information necessary to document the objectives of the test and to determine whether proper procedures were used to accomplish these objectives. The report shall include the following: the certification described in paragraph 3.5.1.; a statement of compliance status, also signed by a responsible official; and, a summary of conditions which form the basis for the compliance status evaluation. The summary of conditions shall include the following:

1. The permit or rule evaluated, with the citation number and language;
2. The result of the test for each permit or rule condition; and,
3. A statement of compliance or noncompliance with each permit or rule condition.

[WV Code § 22-5-4(a)(14-15) and 45CSR13]

3.4. Recordkeeping Requirements

3.4.1. **Retention of records.** The permittee shall maintain records of all information (including monitoring data, support information, reports and notifications) required by this permit recorded in a form suitable and readily available for expeditious inspection and review. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation. The files shall be maintained for at least five (5) years following the date of each occurrence, measurement, maintenance, corrective action, report, or record. At a minimum, the most recent two (2) years of data shall be maintained on site. The remaining three (3) years of data may be maintained off site, but must remain accessible within a reasonable time. Where appropriate, the permittee may maintain records electronically (on a computer, on computer floppy disks, CDs, DVDs, or magnetic tape disks), on microfilm, or on microfiche.

3.4.2. **Odors.** For the purposes of 45CSR4, the permittee shall maintain a record of all odor complaints received, any investigation performed in response to such a complaint, and any responsive action(s) taken.
[45CSR§4. *State-Enforceable only.*]

3.5. Reporting Requirements

3.5.1. **Responsible official.** Any application form, report, or compliance certification required by this permit to be submitted to the DAQ and/or USEPA shall contain a certification by the responsible official that states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate and complete.

3.5.2. **Confidential information.** A permittee may request confidential treatment for the submission of reporting required by this permit pursuant to the limitations and procedures of W.Va. Code § 22-5-10 and 45CSR31.

3.5.3. **Correspondence.** All notices, requests, demands, submissions and other communications required or permitted to be made to the Secretary of DEP and/or USEPA shall be made in writing and shall be deemed to have been duly given when delivered by hand, or mailed first class with postage prepaid to the address(es) set forth below or to such other person or address as the Secretary of the Department of Environmental Protection may designate:

If to the DAQ:

Director
WVDEP
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304-2345

If to the USEPA:

Associate Director
Office of Air Enforcement and Compliance
Assistance Review (3AP20)
U. S. Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

3.5.4. **Operating Fee.**

3.5.4.1. In accordance with 45CSR30 – Operating Permit Program, the permittee shall submit a Certified Emissions Statement (CES) and pay fees on an annual basis in accordance with the submittal requirements of the Division of Air Quality. A receipt for the appropriate fee shall be maintained on the premises for which the receipt has been issued, and shall be made immediately available for inspection by the Secretary or his/her duly authorized representative.

3.5.5. **Emission inventory.** At such time(s) as the Secretary may designate, the permittee herein shall prepare and submit an emission inventory for the previous year, addressing the emissions from the facility and/or process(es) authorized herein, in accordance with the emission inventory submittal requirements of the Division of Air Quality. After the initial submittal, the Secretary may, based upon the type and quantity of the pollutants emitted, establish a frequency other than on an annual basis.

4.0. Source-Specific Requirements

4.1. Limitations and Standards

4.1.1. The emission units/sources identified under Table 1.0 of this permit shall be installed, maintained, and operated so as to minimize any fugitive escape of pollutants, shall not exceed the listed maximum design capacities, and shall use (if applicable) the specified control devices.

4.1.2. **Compressor Engine**
The compressor engine, identified as CE-01, shall meet the following requirements:

a. The engine shall be a Caterpillar, G3616 4SLB 1,380 hp compressor engine and shall only be fired by pipeline-quality natural gas;

b. At all times the engine is in operation, a Catalytic Combustion Corporation Model REM-2415F-D-32HB-HFX4 oxidation catalyst (or one with at least as effective emissions control) shall be used for emissions control. If a different Make/Model of emission control device is used, prior to operation with the new control device, a vendor specification sheet shall be submitted to the DAQ verifying the new post-control emissions of the engine;

c. The maximum emissions from the engine, as controlled by the oxidation catalyst specified under 4.1.2(b), shall not exceed the limits given in the following table:

Table 4.1.2(c): Compressor Engine Emission Limits

Pollutant	PPH[1]	TPY
CO	0.89	3.89
NO_x	1.52	6.66
$PM_{2.5}/PM_{10}/PM$[2]	0.11	0.49
VOC	1.29	5.64
Formaldehyde	0.37	1.60

(1) PPH emissions based on specific model of engine, engine size, and control technology.
(2) Includes condensables.

d. As the annual emissions are based on 8,760 hours of operation, there is no annual limit on hours of operation or natural gas combusted on an annual basis;

e. The emission limitations specified in Table 4.1.2(c) shall apply at all times except during periods of start-up and shut-down provided that the duration of these periods does not exceed 30 minutes per occurrence. The permittee shall operate the engine in a manner consistent with good air pollution control practices for minimizing emissions at all times, including periods of start-up and shut-down. The emissions from start-up and shut-down shall be included in the twelve (12) month rolling total of emissions. The permittee shall comply with all applicable start-up and shut-down requirements in accordance with 40 CFR Part 60, Subparts JJJJ and 40 CFR Part 63, Subpart ZZZZ.

f. **40 CFR 60, Subpart JJJJ**
Owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 75 KW (100 HP) (except gasoline and rich burn engines that use LPG) must comply with the

emission standards in Table 1 to this subpart for their stationary SI ICE.
[40 CFR §60.4233(e)]

g. **40 CFR 60, Subpart OOOO**
You must comply with the standards in paragraphs (a) through (d) of this section for each reciprocating compressor affected facility.

(1) You must replace the reciprocating compressor rod packing according to either paragraph (a)(1) or (2) of this section.

(i) Before the compressor has operated for 26,000 hours. The number of hours of operation must be continuously monitored beginning upon initial startup of your reciprocating compressor affected facility, or October 15, 2012, or the date of the most recent reciprocating compressor rod packing replacement, whichever is later.
[40 CFR §60.5385(a)(1)]

(ii) Prior to 36 months from the date of the most recent rod packing replacement, or 36 months from the date of startup for a new reciprocating compressor for which the rod packing has not yet been replaced.
[40 CFR §60.5385(a)(2)]

h. **40 CFR 63, Subpart ZZZZ**
An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines. No further requirements apply for such engines under this part.
[40 CFR §63.6590(c)]

(1) A new or reconstructed stationary RICE located at an area source;
[40 CFR §63.6590(c)(1)]

4.1.3. **Oxidation Catalysts**
Use of oxidation catalysts shall be in accordance with the following:

a. Lean-burn natural gas compressor engine(s) equipped with oxidation catalyst air pollution control devices shall be fitted with a closed-loop automatic air/fuel ratio feedback controller to ensure emissions of regulated pollutants do not exceed the emission limits listed under Table 4.1.2(c) for any engine/oxidation catalyst combination under varying load. The closed-loop, automatic air/fuel ratio controller shall control a fuel metering valve to ensure a lean-rich mixture;

b. For natural gas compressor engine(s), the permittee shall monitor the temperature to the inlet of the catalyst and in accordance with manufacturer's specifications; a high temperature alarm shall shut off the engine before thermal deactivation of the catalyst occurs. If the engine shuts off due to high temperature, the permittee shall also check for thermal deactivation of the catalyst before normal operations are resumed; and

c. The permittee shall follow a written operation and maintenance plan that provides the periodic and annual maintenance requirements of the oxidation catalyst (this plan may be based on manufacturer's recommendations on operation and maintenance).

4.1.4. **Fugitive Emissions**
The permittee shall mitigate the release of fugitive emissions according to the following requirements:

a. The permittee shall not exceed, at the Francis Compressor Station, the number and type of components (valves, pump seals, connectors, etc.) in gas/vapor or light liquid (as applicable) listed in Attachment N of Permit Application R13-3289, unless an increase in components does not result in an emissions increase in excess of the amounts listed under 45CSR§13-2.17(a) or (b) that would define the increase as a modification;

b. The permittee shall install, maintain, and operate all above-ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to minimize any fugitive escape of regulated air pollutants (leak). Any above-ground piping, valves, pumps, etc. that shows signs of excess wear and that have a reasonable potential for fugitive emissions of regulated air pollutants shall be repaired or replaced as needed;

c. The number of compressor blowdowns and cold starts at the Francis Compressor Station shall each not exceed 208 events per year. However, in lieu of the event limits given in this section, if the permittee can accurately determine the quantity of gas released during each event, the permittee may show compliance with 4.1.4(c) by limiting total annual gas released to less than 1,930 mscf; and

d. Due to the Francis Compressor Station being located at a onshore natural gas processing plant (Oak Grove Natural Gas Processing Facility), the permittee shall meet all requirements as given under 40 CFR 60, Subpart OOOO that incorporate the LDAR requirements of Subpart VVa applicable to equipment and processes at the Francis Compressor Station.

4.1.5. **Operation and Maintenance of Air Pollution Control Equipment.** The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.
[45CSR§13-5.11.]

4.2. Monitoring, Compliance Demonstration, Recording and Reporting Requirements

4.2.1. **Oxidation Catalysts**
The permittee shall meet the following Monitoring, Compliance Demonstration, Recording and Reporting Requirements for the oxidation catalysts:

a. The permittee shall regularly inspect, properly maintain and/or replace catalytic reduction devices and auxiliary air pollution control devices to ensure functional and effective operation of each compressor engine's physical and operational design. The permittee shall ensure proper operation, maintenance and performance of catalytic reduction devices and auxiliary air pollution control devices by:

(1) Maintaining proper operation of the automatic air/fuel ratio controller or automatic feedback controller.

(2) Following the catalyst manufacturer emissions related operating and maintenance recommendations, or develop, implement, or follow a site-specific maintenance plan.

b. To demonstrate compliance with section 4.1.3, the permittee shall maintain records of the maintenance performed on each RICE and/or generator; and

c. To demonstrate compliance with section 4.1.3(c), the permittee shall maintain a copy of the site specific maintenance plan or manufacturer maintenance plan.

4.2.2. **40 CFR 60, Subpart JJJJ**

The permittee shall comply with all applicable monitoring, compliance demonstration and record-keeping requirements as given under 40 CFR 60, Subpart JJJJ including the following:

If you are an owner or operator of a stationary SI internal combustion engine and must comply with the emission standards specified in §60.4233(d) or (e), you must demonstrate compliance according to one of the methods specified in paragraphs (b)(1) and (2) of this section.
[40 CFR §60.4243(b)]

a. Purchasing a non-certified engine and demonstrating compliance with the emission standards specified in §60.4233(d) or (e) and according to the requirements specified in §60.4244, as applicable, and according to paragraphs (b)(2)(i) and (ii) of this section.
[40 CFR §60.4243(b)(2)]

(1) If you are an owner or operator of a stationary SI internal combustion engine greater than 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test and conduct subsequent performance testing every 8,760 hours or 3 years, whichever comes first, thereafter to demonstrate compliance.
[40 CFR §60.4243(b)(2)(ii)]

4.2.3. **Fugitive Emissions**

The permittee shall meet the following Monitoring, Compliance Demonstration, Recording and Reporting Requirements for the fugitive emissions:

a. For the purposes of determining compliance with 4.1.4(c), the permittee shall monitor and record the monthly and rolling twelve month records of the number of compressor blowdowns, station shutdown vents, filter maintenance releases, and pigging events at the facility. The information will further include the duration, estimated volume of gas vented, and reason for event;

b. The permittee shall monitor and record other events (not listed under 4.1.4(c)) where a substantive amount of gas is released (i.e., pressure relief trips). The information will further include the duration, estimated volume of gas vented, reason for event, and corrective actions taken; and

c. The permittee shall report all events recorded under 4.2.3(b) to the DAQ in writing as soon as practicable but no later than fifteen (15) days after the event.

4.3. Performance Testing Requirements

4.3.1. At such reasonable time(s) as the Secretary may designate, in accordance with the provisions of 3.3 of this permit, the permittee shall conduct or have conducted test(s) to determine compliance with the emission limitations established in this permit and/or applicable regulations.

4.3.2. **Compressor Engines**

The permittee shall, pursuant to the timing and other requirements of 40 CFR 60, Subpart JJJJ, conduct, or have conducted, performance testing on the compressor engines to determine the emission rates of CO, NO_x, and VOCs. The testing shall, in addition to meeting all applicable requirements

under 40 CFR 60, Subpart JJJJ, be in accordance with 3.3.1. Results of the this performance testing shall, unless granted in writing a waiver by the Director, be used to determine compliance with the CO, NO_x, and VOC emission limits given under 4.1.2(c).

4.4. Additional Recordkeeping Requirements

4.4.1. **Record of Monitoring.** The permittee shall keep records of monitoring information that include the following:

a. The date, place as defined in this permit and time of sampling or measurements;

b. The date(s) analyses were performed;

c. The company or entity that performed the analyses;

d. The analytical techniques or methods used;

e. The results of the analyses; and

f. The operating conditions existing at the time of sampling or measurement.

4.4.2. **Record of Maintenance of Air Pollution Control Equipment.** For all pollution control equipment listed in Section 1.0, the permittee shall maintain accurate records of all required pollution control equipment inspection and/or preventative maintenance procedures.

4.4.3. **Record of Malfunctions of Air Pollution Control Equipment.** For all air pollution control equipment listed in Section 1.0, the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:

a. The equipment involved.

b. Steps taken to minimize emissions during the event.

c. The duration of the event.

d. The estimated increase in emissions during the event.

For each such case associated with an equipment malfunction, the additional information shall also be recorded:

e. The cause of the malfunction.

f. Steps taken to correct the malfunction.

g. Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.

CERTIFICATION OF DATA ACCURACY

I, the undersigned, hereby certify that, based on information and belief formed after reasonable inquiry, all information contained in the attached _____, representing the period beginning _____ and ending _____, and any supporting documents appended hereto, is true, accurate, and complete.

Signature[1] _____ _____
(please use blue ink) Responsible Official or Authorized Representative Date

Name and Title _____ _____
(please print or type) Name Title

Telephone No. _____ Fax No. _____

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[1] This form shall be signed by a "Responsible Official." "Responsible Official" means one of the following:

a. For a corporation: The president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:

(I) the facilities employ more than 250 persons or have a gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), or

(ii) the delegation of authority to such representative is approved in advance by the Director;

b. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;

c. For a municipality, State, Federal, or other public entity: either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of USEPA); or

d. The designated representative delegated with such authority and approved in advance by the Director.

west virginia department of environmental protection

Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
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Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3289
Plant ID No.:	051-00157
Applicant:	Williams Ohio Valley Midstream LLC
Facility Name:	Francis Compressor Station
Location:	Near Moundsville, Marshall County
SIC/NAICS Codes:	1389/213112
Application Type:	Construction
Received Date:	December 23, 2015
Engineer Assigned:	Joe Kessler
Fee Amount:	$2,000
Date Received:	December 23, 2015
Complete Date:	January 21, 2016
Due Date:	April 20, 2016
Applicant's Ad Date:	December 29, 2015
Newspaper:	*Moundsville Daily Echo*
UTM's:	526.243 km Easting • 4,413.806 km Northing • Zone 17
Latitude/Longitude:	39.87580/-80.69590
Description:	Construction of a natural gas compressor station at the existing Oak Grove Natural Gas Processing Facility. This facility is considered "one-source" with the Oak Grove Natural Gas Processing Facility (will have the same Facility ID Number 051-00157).

DESCRIPTION OF PROCESS

Williams Ohio Valley Midstream LLC (OVM) is proposing to construct a natural gas compressor station to be located at the inlet of the existing Oak Grove Natural Gas Processing Facility (currently operating under the active Permit Number R13-3070A) near Moundsville, Marshall County, WV. The proposed new compressor station will be considered "one-source" with the Oak Grove Natural Gas Processing Facility. The proposed Francis Compressor Station will consist of one (1) natural gas-fired Caterpillar G3616 4-Stroke Lean Burn (4SLB) 1,380 horsepower (hp) compressor engine and one (1) electric Leroi LRG-DP compressor to provide additional pressure to pull natural gas into the adjacent processing plant. At all times the engine is in operation, a Catalytic Combustion Corporation Model REM-2415F-D-32HB-HFX4 oxidation catalyst shall be used for emissions control (CO - 90%, VOCs - 70%, Formaldehyde - 70%).

Fugitives

Equipment Leaks

OVM based their uncontrolled fugitive process and piping components leak calculations (25E) on emission factors taken from the document EPA-453/R-95-017 - "Protocol for Equipment Leak Emission Estimates." Emission factors were taken from Table 2-4 and controlled emissions from various sources (valves and connectors) were based on Table 5-2 and the use of a Leak Detection and Repair (LDAR) protocol that meets the minimum requirement of a 10,000 ppm_v leak definition and monthly monitoring. VOC emissions were based on conservatively estimated light liquid (100% by weight) and gas (28.30% by weight) VOC contents (with a conservative safety factor). Hazardous Air Pollutants (HAPs) were also based on conservatively estimated constituent values. Component counts were based on design estimates.

Maintenance and Emergency Events

OVM also included in their fugitive emission estimate a certain number of scenarios where natural gas is released for emergency or maintenance purposes (24E). Those included were compressor blowdown/startup events (208 events/year) and engine cold starts (208 events/year). Gas released per each event were based on engineering estimates. VOC/HAP by-weight percentages (16,500 lb-VOC/mmscf) of the natural gas was based on actual gas analysis data with a conservative safety factor.

Other Equipment Leaks

OVM estimated new fugitive leaks of natural gas from other potential sources such as leaks from the both compressors' engine rod packing and crankcases (23E). VOC/HAP emissions were based upon emission factors taken from 40 CFR 98, Subpart W and manufacturer's data.

Emissions Summary

Based on the above estimation methodology as submitted in Attachment N of the permit application, the annual PTE of the Francis Compressor Station is given in the following table:

Table 2: Francis Compressor Station (ton/yr) PTE Summary.

Source	CO	NO_x	PM(1)	SO_2	VOCs	HAPs
Compressor Engine	3.89	6.66	0.49	0.03	5.64	1.89
Fugitive Emissions	0.00	0.00	0.00	0.00	24.55	0.59
Facility-Wide Totals →	**3.89**	**6.66**	**0.49**	**0.03**	**30.19**	**2.48**

(1) All particulate matter emissions are assumed to be less than 2.5 microns. Includes condensables.

The new post-modification facility-wide of the Oak Grove Natural Gas Processing Facility including the Francis Compressor Station is included as Attachment A.

REGULATORY APPLICABILITY

The proposed Francis Compressor Station is subject to the following substantive state and federal air quality rules and regulations: 45CSR13, 40 CFR 60 Subpart JJJJ, and 40 CFR 63, Subpart ZZZZ. Each applicable rule (and those that have questionable non-applicability) and OVM's compliance therewith will be discussed in detail below.

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 construction of the Francis Compressor Station at the existing Oak Grove Natural Gas Processing Facility has a potential to increase emissions at the existing facility in excess of six (6) lbs/hour and ten (10) TPY of a regulated pollutant (see Attachment A) and, therefore, pursuant to §45-13-2.24, the changes are defined as a "modification" under 45CSR13. Pursuant to §45-13-5.1, "[n]o person shall cause, suffer, allow or permit the construction, modification, relocation and operation of any stationary source to be commenced without . . . obtaining a permit to construct." Therefore, OVM is required to obtain a permit under 45CSR13 for the modification of the facility.

As required under §45-13-8.3 ("Notice Level A"), OVM placed a Class I legal advertisement in a "newspaper of *general circulation* in the area where the source is . . . located." The ad ran on December 29, 2015 in the *Moundsville Daily Echo* and the affidavit of publication for this legal advertisement was submitted on December 31, 2015.

45CSR14: Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration - (NON APPLICABILITY)

The Francis Compressor Station is being constructed (and will be considered one source with) the Oak Grove Natural Gas Processing Facility. This facility is located in Marshall County, WV. Marshall County is classified as "in attainment" with all National Ambient Air Quality Standards (NAAQS) except for, in certain tax districts, SO_2. The Clay Tax District, where the Moundsville facility is located, is classified as "non-attainment" for SO_2. Therefore, applicability to major New Source Review (NSR) for all pollutants except for SO_2 is determined under 45CSR14.

As the facility is not a "listed source" under §45-14-2.43, the individual major source applicability threshold for all criteria pollutants (with the exception of SO_2) is 250 TPY. As given above in Attachment A, the facility-wide post-modification PTE of the Oak Grove Natural Gas Processing Facility (including the Francis Compressor Station) is less than 250 TPY for all criteria pollutants. Therefore, the facility is not defined as a "major stationary source" under 45CSR14.

It is also important to note that the facility does not contain a "nested" major stationary source - in this case a secondary listed source: "Fossil Fuel Boilers (or combinations thereof) Totaling More than 250 Million Btu/hour Heat Input." All the natural-gas fired heaters would contribute to this 250 mmBtu/hr threshold. However, the aggregate MDHI of all the heaters is 223.36 mmBtu/hr. Therefore, no "nested" source is located at the Oak Grove Natural Gas Processing Facility.

45CSR19: Requirements for Pre-Construction Review, Determination of Emission Offsets for Proposed New or Modified Stationary Sources of Air Pollutants and Emission Trading for Intrasource Pollutants - (NON APPLICABILITY)

The Francis Compressor Station is being constructed (and will be considered one source with) the Oak Grove Natural Gas Processing Facility. Pursuant to §45-19-3.1, 45CSR19 "applies to all major stationary sources and major modifications to major stationary sources proposing to construct anywhere in an area which is designated non-attainment." As noted above, the Oak Grove Natural Gas Processing Facility (including the Francis Compressor Station) is located in Marshall County, WV which is classified as in attainment with all NAAQS; with the exception for SO_2 in the areas defined as the Clay (where the source is located), Washington, and Franklin Tax Districts. Pursuant to §45-14-2.35, the individual major source applicability threshold for all non-attainment pollutants is 100 TPY. As given in Attachment A, the facility-wide post-modification SO_2 PTE of the Oak Grove Natural Gas Processing Facility (including the Francis Compressor Station) is less than 100 TPY. Therefore, the facility is not defined as a "major stationary source" under 45CSR19 and the changes evaluated herein will not trigger the requirements of 45CSR19.

45CSR27: To Prevent and Control the Emissions of Toxic Air Pollutants - (NON APPLICABILITY)

Pursuant to §45-27-3.1, the "owner or operator of a plant that discharges or may discharge a toxic air pollutant into the open air in excess of the amount shown in the Table A [of 45CSR27] shall employ [Best Available Technology] at all chemical processing units emitting the toxic air pollutant." As calculated from Table 1 above, the PTE of formaldehyde generated by the compressor engine is greater than 0.5 TPY - greater than the 1,000 pound per year threshold given in Table A of 45CSR27. However, internal combustion engines do no meet the definition of "chemical processing units" under §45-27-2.4 and, therefore, the proposed engine is not subject to BAT under 45CSR27.

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. Oak Grove Natural Gas Processing Facility (including the Francis Compressor Station) 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. Therefore, the Oak Grove Natural Gas Processing Facility (including the Francis Compressor Station) is subject to 45CSR30. Changes authorized by the draft permit must also be incorporated into the facility's Title V permit application or operating permit. Commencement date of any operation authorized by this permit shall be determined by the appropriate timing limitations associated with Title V permit revisions per 45CSR30.

40 CFR 60 Subpart JJJJ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines.

OVM's proposed Caterpillar G3616 4SLB 1,380 hp compressor engine is defined under 40 CFR 60, Subpart JJJJ as stationary spark-ignition internal combustion engines (SI ICE) and is, pursuant to §60.4230(a)(4)(i), subject to the applicable provisions of the rule. Pursuant to

§60.4233(e): "Owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 75 KW (100 HP) (except gasoline and rich burn engines that use LPG) must comply with the emission standards in Table 1 to this subpart for their stationary SI ICE." Therefore, as the proposed OVM's compressor engine is greater than 100 hp, it must comply with the emission standards under Table 1 for "Non-Emergency SI ICE ≥ 500 hp manufactured after July 1, 2010:" NO_x - 1.0 g/HP-hr, CO - 2.0 g/HP-hr, and VOC - 0.7 g/HP-hr. The emission standards and the proposed compliance therewith of the engines are given in the following table:

Table 3: Caterpillar G3616 Subpart JJJJ Compliance

Pollutant	Standard (g/HP-hr)	Uncontrolled Emissions (g/bhp)(1)	Control Percentage	Controlled Emissions (g/bhp)(1)	JJJJ Compliant?
NO_x	1.0	0.50	0.00%	0.50	Yes
CO	2.0	2.92	90.00%	0.29	Yes
VOC	0.7	1.41	70.21%	0.42	Yes

(1) Based on the Catalytic Combustion Corporation Model REM-2415F-D-32HB-HFX4 oxidation catalyst specification sheet included in the permit application. VOC emissions based on NMNEHC + CH_2O emission factors.

The Caterpillar G3616 is not a "certified" engine under Subpart JJJJ so OVM will have to show compliance with the emission standards pursuant to §60.4243(b)(2)(ii): conducting an initial performance test and thereafter conducting subsequent performance testing every 8,760 hours or 3 years, whichever comes first, to demonstrate compliance. Performance testing requirements are given under §60.4244 of Subpart JJJJ. OVM will additionally have to meet all applicable monitoring, recording, and record-keeping requirements under Subpart JJJJ.

40 CFR 60, Subpart OOOO: Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution

On April 27, 2012, the USEPA issued a final rule (with amendments finalized on August 16, 2012) that consists of federal air standards for natural gas wells that are hydraulically fractured, along with requirements for several other sources of pollution in the oil and gas industry that currently are not regulated at the federal level. Each potentially applicable section of Subpart OOOO is discussed below.

Compressor Engines

Pursuant to §60.5365(c), "[e]ach 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" that is constructed after August 23, 2011 is subject to the applicable provisions of Subpart OOOO. As the Francis Compressor Station is located before the point of custody transfer, the compressor engines are applicable to Subpart OOOO. The substantive requirements for the engines are given under §60.5385(a): the engines' "rod packing" must replaced according to the given schedule and the engine must meet applicable MRR given under §60.5410(c), §60.5415(c), and §60.5420(b)(1).

Pneumatic Controllers

Pursuant to §60.5365(d)(2), "[f]or 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" that is constructed after August 23, 2011 is subject to the applicable provisions of Subpart OOOO. As the Francis Compressor Station is located before the point of custody transfer, any pneumatic controllers that meet the above definition will be required to meet the substantive requirement for pneumatic controllers as given under §60.5390.

Leak Detection and Repair Requirements (LDAR)

The substantive requirement for affected facilities at a natural gas processing plant is to meet the applicable LDAR conditions under Subpart VVa. The Oak Grove Natural Gas Processing Facility (which includes the Francis Compressor Station evaluated herein) is a natural gas processing plant that was modified after August 23, 2011. Therefore, LDAR requirements for onshore natural gas processing plants will apply to any applicable equipment at the Francis Compressor Station.

40 CFR 63 Subpart ZZZZ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

On June 1, 2013 the DAQ took delegation of the area source provisions of 40 CFR 63, Subpart ZZZZ. As the Francis Compressor Station is defined as an area source of HAPs (see Attachment A), the facility is subject to applicable requirements of Subpart ZZZZ. Pursuant to §63.6590(c):

> An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines. No further requirements apply for such engines under this part.

§63.6590(c)(1) specifies that "[a] new or reconstructed stationary RICE located at an area source" is defined as a RICE that shows compliance with the requirements of Subpart ZZZZ by "meeting the requirements of . . . 40 CFR part 60 subpart JJJJ, for spark ignition engines." Pursuant to §63.6590(a)(2)(iii), a "stationary RICE located at an area source of HAP emissions is new if [the applicant] commenced construction of the stationary RICE on or after June 12, 2006." The engine proposed for the Francis Compressor Station is defined as a new stationary RICE (application states manufacture date of engines is after June 12, 2006) and, therefore, will show compliance with Subpart ZZZZ by meeting the requirements of 40 CFR 60, Subpart JJJJ. Compliance with Subpart JJJJ is discussed above.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the proposed Francis Compressor Station 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_{10} and $PM_{2.5}$), 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 following table lists each HAP with a PTE contribution from the Francis Compressor Station above 0.05 TPY (100 lbs/yr) and the associated carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

Table 4: Potential HAPs - Carcinogenic Risk

HAPs	Type	Known/Suspected Carcinogen	Classification
Acetaldehyde	VOC	Yes	B2 - Probable Human Carcinogen
Acrolein	VOC	No	Inadequate Data
Formaldehyde	VOC	Yes	B1 - Probable Human Carcinogen
n-Hexane	VOC	No	Inadequate Data

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 estimated maximum emissions of the modification are less than applicability thresholds that would define the proposed modification as "major" under 45CSR14 and, therefore, no air quality impacts modeling analysis was required. Additionally, based on the nature and location of the proposed source, an air quality impacts modeling analysis was not required under §45-13-7.

MONITORING, COMPLIANCE DEMONSTRATIONS, REPORTING, AND RECORDING OF OPERATIONS

The draft permit contains the following substantive monitoring, compliance demonstration, reporting, and record-keeping requirements (MRR):

- OVM shall be required to meet the following Monitoring, Compliance Demonstration, Recording and Reporting Requirements for the oxidation catalysts:

  a. OVM shall be required to regularly inspect, properly maintain and/or replace catalytic reduction devices and auxiliary air pollution control devices to ensure functional and effective operation of each compressor engine's physical and operational design. OVM shall be required to ensure proper operation, maintenance and performance of catalytic reduction devices and auxiliary air pollution control devices by:

     (1) Maintaining proper operation of the automatic air/fuel ratio controller or automatic feedback controller.

     (2) Following the catalyst manufacturer emissions related operating and maintenance recommendations, or develop, implement, or follow a site-specific maintenance plan.

  b. To demonstrate compliance with section 4.1.3. of the draft permit, OVM shall be required to maintain records of the maintenance performed on each RICE and/or generator; and

  c. To demonstrate compliance with section 4.1.3(c) of the draft permit, OVM shall be required to maintain a copy of the site specific maintenance plan or manufacturer maintenance plan.

- OVM shall be required to meet the following Monitoring, Compliance Demonstration, Recording and Reporting Requirements for the fugitive emissions:

  a. For the purposes of determining compliance with 4.1.4(c) of the draft permit, OVM shall be required to monitor and record the monthly and rolling twelve month records of the number of compressor blowdowns, station shutdown vents, filter maintenance releases, and pigging events at the facility. The information will further include the duration, estimated volume of gas vented, and reason for event;

  b. OVM shall be required to monitor and record other events (not listed under 4.1.4(c) of the draft permit) where a substantive amount of gas is released (i.e., pressure relief trips). The information will further include the duration, estimated volume of gas vented, reason for event, and corrective actions taken; and

  c. OVM shall be required to report all events recorded under 4.2.3(b) of the draft permit to the DAQ in writing as soon as practicable but no later than fifteen (15) days after the event.

PERFORMANCE TESTING OF OPERATIONS

The draft permit contains the following substantive performance testing requirements:

- At such reasonable time(s) as the Secretary may designate, in accordance with the provisions of 3.3 of the draft permit, OVM shall be required to conduct or have conducted test(s) to determine compliance with the emission limitations established in this permit and/or applicable regulations.

- OVM shall be required to, pursuant to the timing and other requirements of 40 CFR 60, Subpart JJJJ, conduct, or have conducted, performance testing on the compressor engines to determine the emission rates of CO, NOx, and VOCs. The testing shall, in addition to meeting all applicable requirements under 40 CFR 60, Subpart JJJJ, be in accordance with 3.3.1. of the draft permit. Results of the this performance testing shall, unless granted in writing a waiver by the Director, be used to determine compliance with the CO, NOx, and VOC emission limits given under 4.1.2(c) of the draft permit.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that compliance with all applicable state and federal air quality regulations will be achieved. Therefore, I recommend to the Director the issuance of a Permit Number R13-3289 to Williams Ohio Valley Midstream LLC for the proposed construction and operation of the Francis Compressor Station located at the existing Oak Grove Natural Gas Processing Facility near Moundsville, Marshall County, WV.

Joe Kessler, PE
Engineer

2/25/10
Date

Attachment A: Facility-Wide PTE

Williams Ohio Valley Midstream, LLC: Francis Compressor Station (part of Oak Grove Natural Gas Processing Facility)
Permit Number R13-3289: Facility ID 051-00157

Emission Unit	EP ID	CO		NO_x		PM[1]		SO_x		VOC		n-Hexane		Total HAPs	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
TXP1 Heat Medium Heater	1E	2.16	9.47	2.57	11.28	0.20	0.86	0.02	0.07	0.15	0.64	0.05	0.20	0.05	0.21
TXP1 Regeneration Gas Heater	2E	0.77	3.39	0.92	4.04	0.07	0.31	0.01	0.02	0.05	0.23	0.02	0.07	0.02	0.08
TXP2 Regeneration Gas Heater	3E	0.81	3.56	0.73	3.20	0.26	1.16	0.01	0.05	0.39	1.69	0.04	0.16	0.04	0.16
TXP3 Regeneration Gas Heater	4E	0.81	3.56	0.73	3.20	0.26	1.16	0.01	0.05	0.39	1.69	0.04	0.16	0.04	0.16
DeC2 Hot Oil Heater	5E	2.53	11.07	2.46	10.77	0.51	2.23	0.04	0.18	0.38	1.67	0.12	0.53	0.13	0.55
DeC2 Hot Oil Heater	6E	2.53	11.07	2.46	10.77	0.51	2.23	0.04	0.18	0.38	1.67	0.12	0.53	0.13	0.55
DeC2 Regeneration Gas Heater	7E	0.86	3.77	1.02	4.48	0.08	0.34	0.01	0.03	0.06	0.25	0.02	0.08	0.02	0.08
Flare Combustion Exhaust	8E	1,273.91	146.28	638.12	73.27	19.50	2.39	1.54	0.19	0.00	0.00	0.00	0.00	0.00	0.00
Flare Pass-Through Emissions		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	177.30	20.36	5.48	0.63	34.38	3.95
Emergency Generator	9E	1.98	0.49	0.99	0.25	0.04	0.01	0.00	0.00	0.54	0.13	0.00	0.00	0.07	0.02
Storage Tanks	10E-13E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.32	18.96	0.16	0.64	0.88	3.80
Truck Loadout	14E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	27.13	18.09	0.90	0.60	5.43	3.62
Amine Process Unit Vent	16E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.49	0.00	0.00	0.00	0.00
Piping & Component Fugitives	15E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.43	42.50	0.02	0.10	0.14	0.60
Misc. Equipment Leaks	17E-18E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	3.63	0.00	0.01	0.01	0.05
Francis (Engine)	25E	0.89	3.89	1.52	6.66	0.11	0.49	0.01	0.03	1.29	5.64	0.00	0.02	0.43	1.89
Francis (Fugitives)	23E-24E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.61	24.55	0.08	0.33	0.13	0.59
Independence (Fugitives)[2]	n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	1.06	0.00	0.00	0.08	0.35
Facility-Wide Total →		***1,287.25***	***196.55***	***651.52***	***127.92***	***21.54***	***11.18***	***1.69***	***0.80***	***232.70***	***143.25***	***7.06***	***4.06***	***41.98***	***16.66***
Facility-Wide PTE[3] →		***1,287.25***	***196.55***	***651.52***	***127.92***	***21.54***	***11.18***	***1.69***	***0.80***	***212.49***	***71.51***	***6.95***	***3.62***	***41.62***	***15.07***

(1) All particular matter emissions are assumed to be 2.5 microns or less.
(2) **The Independence Compressor Station is a co-located (aggregated source) electric compressor station that only has fugitive emissions sources. It was reviewed under PD15-057.**
(3) PTE does not include fugitive emissions. No individual HAP has a PTE over 10 TPY (n-Hexane is the largest contributor). As the PTE of all individual HAPs are less than 10 TPY the PTE of total HAPs is less than 25 TPY, the Oak Grove Natural Gas Processing Facility (now including the Francic Compressor Station) is defined as a minor (area) source for purposes of 40 CFR 61 and 40CFR63.

INTERNAL PERMITTING DOCUMENT TRACKING MANIFEST

Company Name Williams Ohio Valley Midstream LLC

Permitting Action Number R13-3289 Total Days 64 DAQ Days 35

Permitting Action:

- ○ Permit Determination
- ○ General Permit
- ○ Administrative Update
- ○ Temporary
- ○ Relocation
- ☒ Construction
- ○ Modification
- ○ PSD (Rule 14)
- ○ NNSR (Rule 19)

Documents Attached:

- ☒ Engineering Evaluation/Memo
- ☒ Draft Permit
- ☒ Notice
- ○ Denial
- ○ Final Permit/General Permit Registration
- ☒ Completed Database Sheet
- ○ Withdrawal
- ○ Letter
- ○ Other *(specify)* _____

Date	From	To	Action Requested
2/25/16	Joe Kessler	Bev McKeone	Notice Approval
3/7	Bev	Joe	Cust Notice

NOTE: Retain a copy of this manifest for your records when transmitting your document(s).

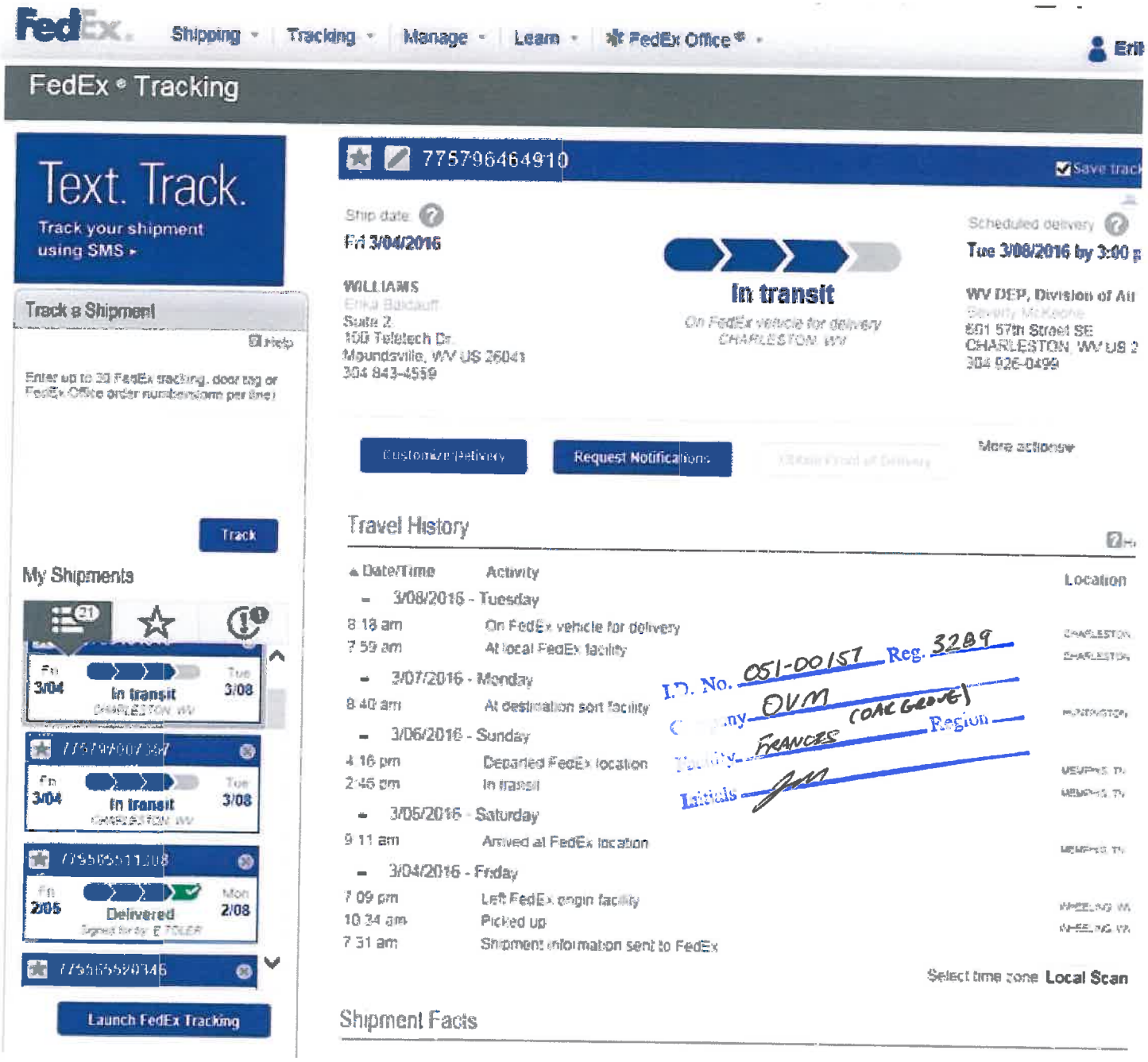
Kessler, Joseph R

From: Baldauff, Erika <Erika.Baldauff@williams.com>
Sent: Tuesday, March 08, 2016 8:50 AM
To: Kessler, Joseph R
Subject: RE: Revised Francis Permit Applications

Entire Document
NON-CONFIDENTIAL

Good Morning Joe,

I would have thought you would have received it yesterday, but looks like it is out for delivery today. I am glad I emailed it to you.



Thanks,
Erika

From: Kessler, Joseph R [mailto:Joseph.R.Kessler@wv.gov]
Sent: Tuesday, March 08, 2016 8:42 AM
To: Baldauff, Erika <Erika.Baldauff@williams.com>
Subject: RE: Revised Francis Permit Applications

I am going to review changes right now. I have not got a package receipt notice for revised app, did it make it here yet?

Joe

From: Baldauff, Erika [mailto:Erika.Baldauff@williams.com]
Sent: Monday, March 07, 2016 3:28 PM
To: Kessler, Joseph R <Joseph.R.Kessler@wv.gov>
Subject: RE: Revised Francis Permit Applications

Hi Joe,

As soon as you have an idea of the new timeline for Francis, please let me know.

Thank you,
Erika

From: Baldauff, Erika
Sent: Friday, March 04, 2016 8:39 AM
To: Kessler, Joseph R <Joseph.R.Kessler@wv.gov>
Subject: Revised Francis Permit Applications

Good Morning Joe:

Attached is the revised Francis permit application that I am overnighting to you today, complete with 2 discs. When you have an idea of the estimated timeline to go to public notice, please let me know.

Thanks!!

Erika Baldauff | Williams | Environmental Specialist | Ohio River Supply Hub
Office: 304-843-4559 | Cell: 304-281-9564 | Fax: 304-843-3196 | 100 Teletech Drive Suite 2, Moundsville, WV 26041

Kessler, Joseph R

From: Baldauff, Erika <Erika.Baldauff@williams.com>
Sent: Friday, March 04, 2016 8:39 AM
To: Kessler, Joseph R
Subject: Revised Francis Permit Applications
Attachments: 0000_-_Francis_CS_(OGGP)_-_NSR_-_REVISED_APPLICATION_-_03.02.16.pdf

Good Morning Joe:

Attached is the revised Francis permit application that I am overnighting to you today, complete with 2 discs. When you have an idea of the estimated timeline to go to public notice, please let me know.

Thanks!!

Erika Baldauff | Williams | Environmental Specialist | Ohio River Supply Hub
Office: 304-843-4559 | Cell: 304-281-9564 | Fax: 304-843-3196 | 100 Teletech Drive Suite 2, Moundsville, WV 26041

Kessler, Joseph R

From: Baldauff, Erika <Erika.Baldauff@williams.com>
Sent: Thursday, March 03, 2016 5:25 PM
To: Kessler, Joseph R
Subject: RE: Francis Engine Catalyst Model

Hi Joe,

Paul just signed the Francis revised application. I will send you a signed email copy tomorrow, and overnight the hard copy with discs.

Thanks,
Erika

From: Kessler, Joseph R [mailto:Joseph.R.Kessler@wv.gov]
Sent: Wednesday, March 02, 2016 5:11 PM
To: Baldauff, Erika <Erika.Baldauff@williams.com>
Subject: RE: Francis Engine Catalyst Model

OK, I was under the impression the new compressor would be gas-fired. Will not take much work to put an electric compressor in the permit. Should be able to get it back on Bev's desk pretty quickly.

Joe

From: Baldauff, Erika [mailto:Erika.Baldauff@williams.com]
Sent: Wednesday, March 02, 2016 5:01 PM
To: Kessler, Joseph R <Joseph.R.Kessler@wv.gov>
Subject: RE: Francis Engine Catalyst Model

Joe,

The revised Francis permit application is ready for Paul Hunter to certify. Hopefully I will be able to catch up with him tomorrow. VOC and HAP emissions have increased by 0.71 TPY and 0.01 TPY, respectively, associated with addition of the small motor driven reciprocating compressor (LeROI LRG9-DP, 10hp). Emissions from the new compressor include rod packing leaks and blowdown emissions.

Thanks,
Erika

From: Kessler, Joseph R [mailto:Joseph.R.Kessler@wv.gov]
Sent: Tuesday, March 01, 2016 1:50 PM
To: Baldauff, Erika <Erika.Baldauff@williams.com>
Subject: RE: Francis Engine Catalyst Model

For that big of a change I would like you to submit complete revised application w/ new electronic copies on disks. The revised application should be signed by Paul Hunter. You do not need to re-ad, I can catch the increase in my notice. Obviously, this will significantly delay the permit as I will have to take it back from Bev and then re-write the evaluation, add the new engine to the permit, and give it back to her.

Joe

From: Baldauff, Erika [mailto:Erika.Baldauff@williams.com]
Sent: Tuesday, March 01, 2016 1:25 PM
To: Kessler, Joseph R <Joseph.R.Kessler@wv.gov>
Subject: RE: Francis Engine Catalyst Model

Hi Joe,

I was in a contractor pre-bid meeting today, and **just** found out that we will be making changes to the Francis permit application. A smaller compressor will be installed **in addition** to the CAT3516 package. The original design of the air operated pumps was revisited due to concern that the design would not work as intended. Initial discussions estimate that the amount of additional emissions will be low, and the unit will only run approximately less than 200 hours per year.

I will be in touch as I get the updated manufacture specification sheets/revised permit application. After I get the updated information I will let you know. Other questions we can work through include the following:

- Would you prefer just the revised/additional sheet to be submitted
- I assume Paul Hunter will need to certify the sheets/revised application
- Should I rerun the public ad.

Thanks,
Erika

From: Kessler, Joseph R [mailto:Joseph.R.Kessler@wv.gov]
Sent: Tuesday, March 01, 2016 10:43 AM
To: Baldauff, Erika <Erika.Baldauff@williams.com>
Subject: RE: Francis Engine Catalyst Model

I submitted for notice approval on 2/25/16.

Joe

From: Baldauff, Erika [mailto:Erika.Baldauff@williams.com]
Sent: Tuesday, March 01, 2016 9:48 AM
To: Kessler, Joseph R <Joseph.R.Kessler@wv.gov>
Subject: RE: Francis Engine Catalyst Model

Hi Joe,

Touching base on the status of Francis.

Thanks!

Erika

From: Kessler, Joseph R [mailto:Joseph.R.Kessler@wv.gov]
Sent: Thursday, February 25, 2016 10:03 AM
To: Baldauff, Erika <Erika.Baldauff@williams.com>
Subject: RE: Francis Engine Catalyst Model

OK, we can revisit then.

Joe

From: Baldauff, Erika [mailto:Erika.Baldauff@williams.com]
Sent: Thursday, February 25, 2016 9:40 AM
To: Kessler, Joseph R <Joseph.R.Kessler@wv.gov>
Subject: RE: Francis Engine Catalyst Model

That is fine by me. However, we will probably make a comment on the "draft" permit, depending on what feedback I get when we do our internal permit review. But, the fact that the issue came up at Sand Hill, I can understand the basis.

Thanks,
Erika

From: Kessler, Joseph R [mailto:Joseph.R.Kessler@wv.gov]
Sent: Thursday, February 25, 2016 9:35 AM
To: Baldauff, Erika <Erika.Baldauff@williams.com>
Subject: RE: Francis Engine Catalyst Model

I know it's something I put in my compressor permits (not just OVM). We have had several cases of companies putting on other models that are not as effective and then catching it on inspection or the companies coming in for after-the-fact changes. That Sand Hill permit is a case in point. Putting a specific model requirement in there provides enforceability and seems to help the company remember that the emissions were based on a specific model. I will add the flexibility language but will want to keep a reference to the original model number in there.

Joe

From: Baldauff, Erika [mailto:Erika.Baldauff@williams.com]
Sent: Thursday, February 25, 2016 9:30 AM
To: Kessler, Joseph R <Joseph.R.Kessler@wv.gov>
Subject: RE: Francis Engine Catalyst Model

Hi Joe,

Whatever flexibility you can include is great. Do you of any other Williams permits that specifically call out the model of the oxidation catalyst? I am still getting up to speed on things here. I do not have a feel yet of how often catalyst "models" change (due to operational reasons or even just because vendors change their naming conventions without change to the catalysts). However, I know when I inquired to Walter, our permit application writer, he advised me: "We need to be sure that we are not explicitly limited to OxCat model REM-2415F-D-32HB-HFX4". In the permit applications, we provide the make and model of catalyst and then say "or equivalent" to provide you with the flexibility of installing something different but that meets the required control efficiencies."

I appreciate your promptness of working on this permit application.

Thanks,
Erika

From: Kessler, Joseph R [mailto:Joseph.R.Kessler@wv.gov]
Sent: Thursday, February 25, 2016 9:16 AM
To: Baldauff, Erika <Erika.Baldauff@williams.com>
Subject: RE: Francis Engine Catalyst Model

Thanks. As for adding "or equivalent," the recommendation to issue the draft permit will be based, in part, on the post-control emission factors given for the specific model of oxidation catalyst. Any change in oxidation catalyst model would have to be approved by the DAQ based on the submission a new vendor data sheet and calculations. So I added some language to try to allow some flexibility but will require submitting a new vendor sheet to us.

Joe

From: Baldauff, Erika [mailto:Erika.Baldauff@williams.com]
Sent: Tuesday, February 23, 2016 5:08 PM
To: Kessler, Joseph R <Joseph.R.Kessler@wv.gov>
Subject: Francis Engine Catalyst Model

Joe,

> The OxCat model is REM-2415F-D-32HB-HFX4. If you reference the catalyst model number, can you say "or equivalent" to provide the flexibility of installing something different but that meets the required control efficiencies?

Thanks!!!
Erika

Williams Ohio Valley Midstream LLC
100 Teletech Drive, Suite 2
Moundsville, WV 26041
(304) 843-4559
(304) 843-3196 fax

March 3, 2016
(Via Federal Express)

Beverly McKeone
New Source Review Program Manager
Division of Air Quality
West Virginia Department of Environmental Protection
601 57th Street SE
Charleston, WV 25304-2345

I.D. No. 051-00157 Reg. 3289
Company OVM
Facility FRANCIS (OAK GROVE) Region
Initials JL.

Subject: **Revised Application for 45CSR13 NSR Construction Permit**
Williams Ohio Valley Midstream LLC
FRANCIS COMPRESSOR STATION
Moundsville, Marshall County, West Virginia

Dear Ms. McKeone:

Williams Ohio Valley Midstream LLC (OVM) is submitting one (1) original paper copy and two (2) CD-ROMs of a Revised Application for 45CSR13 New Source Review (NSR) Construction Permit for the proposed Francis Compressor Station, to be located at the OVM Oak Grove Gas Plant; ~0.4 miles north of 5258 Fork Ridge Rd, ~3.7 miles southeast of Moundsville, in Marshall County, West Virginia.

This application for 45CSR13 NSR Construction Permit has been prepared and submitted to provide for the installation and operation of the following equipment and operations at the subject facility:

- ONE (1) 1,380 BHP CAT G3516B COMPRESSOR ENGINE W/ OXCAT — CE-01/22E
- COMPRESSOR ROD PACKING AND ENGINE CRANKCASE LEAKS — RPC-3/23E
- START/STOP/MAINTENANCE (INCLUDING BLOWDOWN) — SSM-2/24E
- PIPING AND EQUIPMENT FUGITIVE EMISSIONS — FUG-3/25E

Note the application is revised to incorporate one small electric motor driven reciprocating compressor and its associated rod packing leaks and blowdown emissions. With construction and operation of the Francis Compressor Station, the Oak Grove Gas Plant will continue to qualify as a Minor Source under the Prevention of Significant Deterioration (PSD) regulations and an Area Source for Hazardous Air Pollutants (HAP) under the National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations. Furthermore, the Oak Grove Gas Plant will remain subject to Title V Operating Permit regulations and the Francis Compressor Station will be incorporated into the Oak Grove Gas Plant Title V Operating Permit as requisite.

The Facility-Wide Emissions Summary (including the Oak Grove Gas Plant, Francis Compressor Station, and Independence Compressor Station) is shown below:

Entire Document
NON-CONFIDENTIAL

Williams Ohio Valley Midstream LLC
FRANCIS COMPRESSOR STATION (and OAK GROVE GP and INDEPENDENCE CS)
Application for 45CSR13 NSR Construction Permit

Facility-Wide Emissions Summary [Tons per Year]

Criteria Pollutants	Potential Emissions				Permit Thresholds		
	Francis	Oak Grove	Independence	TOTAL	WV-NSR	TVOP	PSD
Nitrogen Oxides (NOX)	6.66	121.26	—	127.93	10	100	250
Carbon Monoxide (CO)	3.89	192.57	—	196.47	10	100	250
Volatile Organic Compounds (VOC) - Point	27.42	69.94	1.00	98.36	na	na	250
Volatile Organic Compounds (VOC) - Fugitive	2.77	42.50	0.06	45.34	na	na	na
Volatile Organic Compounds (VOC) - TOTAL	30.19	112.44	1.06	143.69	10	100	na
Sulfur Dioxide (SO2)	0.03	0.76	—	0.79	10	100	250
Particulate Matter (PM10/2.5)	0.49	10.68	—	11.18	10	100	250
Hazardous Air Pollutants (HAP)	**Potential Emissions (Including Fugitives)**				**Permit Thresholds**		
	Francis	Oak Grove	Independence	TOTAL	WV-NSR	TVOP	PSD
Acetaldehyde	0.12	—	—	0.12	5.0	10	na
Acrolein	0.08	—	—	0.08	5.0	10	na
Benzene	0.05	1.86	0.06	1.97	0.5	10	na
Ethylbenzene	0.04	2.04	0.06	2.14	5.0	10	na
Formaldehyde	1.65	0.12	—	1.77	0.5	10	na
n-Hexane	0.36	3.70	0.06	4.12	5.0	10	na
Methanol	0.04	—	—	0.04	5.0	10	na
Toluene	0.05	1.96	0.06	2.06	5.0	10	na
2,2,4-TMP	0.04	2.10	0.06	2.20	5.0	10	na
Xylenes	0.04	2.05	0.06	2.15	5.0	10	na
Other HAP	0.01	0.01	—	0.02	5.0	10	na
Total HAP	2.48	13.84	0.35	16.67	5.0	25	na
Other Regulated Pollutants (Other than Criteria and HAP)	**Potential Emissions (Including Fugitives)**				**Permit Thresholds**		
	Francis	Oak Grove	Independence	TOTAL	WV-NSR	TVOP	PSD
Carbon Dioxide (CO_2)	6,761	218,331	16	225,108	na	na	na
Methane (CH_4)	80	416	292	788	na	na	na
Nitrous Oxide (N_2O)	0.01	69	—	69	na	na	na
CO_2 equivalent (CO_2e)	8,751	249,163	7,327	265,241	na	100,000	na

If you have any questions concerning this submittal or need additional information, please contact me by telephone at (304) 843-4559 or by e-mail at Erika.Baldauff@Williams.com.

Sincerely,

Erika Baldauff

Erika Baldauff
Environmental Specialist

Enclosures:
Application for NSR Construction Permit
Attachments A through S
Check for Application Fee

APPLICATION FOR
45CSR13 NEW SOURCE REVIEW
CONSTRUCTION PERMIT

For the:

Williams Ohio Valley Midstream LLC

FRANCIS COMPRESSOR STATION

(Located at the Existing OVM Oak Grove Gas Plant)

Marshall County, West Virginia

Submitted to:

WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR QUALITY

Submitted by:

Williams Ohio Valley Midstream LLC
100 Teletech Drive, Suite 2
Moundsville, WV 26041

Prepared by:

EcoLogic Environmental Consultants, LLC
864 Windsor Court
Santa Barbara, CA 93111

Original Submittal: December 2015
Revised Submittal: March 2016

APPLICATION FOR
45CSR13 NEW SOURCE REVIEW
CONSTRUCTION PERMIT

Williams Ohio Valley Midstream LLC

FRANCIS COMPRESSOR STATION

(Located at the Existing OVM Oak Grove Gas Plant)

Marshall County, West Virginia

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APPLICATION FEE

APPLICATION FOR
45CSR13 NEW SOURCE REVIEW
CONSTRUCTION PERMIT

- **SECTION I. General**
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- **SECTION III. Certification of Information**

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☒ **CONSTRUCTION** ☐ **MODIFICATION** ☐ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☐ **CLASS II ADMINISTRATIVE UPDATE** ☐ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☒ **MINOR MODIFICATION**
☐ **SIGNIFICANT MODIFICATION**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office)*:
WILLIAMS OHIO VALLEY MIDSTREAM LLC (OVM)

2. Federal Employer ID No. ***(FEIN)***:
27-0856707

3. Name of facility *(if different from above)*:
FRANCIS COMPRESSOR STATION (FCS)
(AT THE OAK GROVE GAS PLANT (OGGP))

4. The applicant is the:
☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**

5A. Applicant's mailing address:
WILLIAMS OHIO VALLEY MIDSTREAM LLC (OVM)
100 TELETECH DR, STE 2
MOUNDSVILLE, WV 26041

5B. Facility's present physical address:
~0.4 MILES NORTH OF 5258 FORK RIDGE ROAD
~3.7 MILES SE OF MOUNDSVILLE
MOUNDSVILLE, MARSHALL COUNTY, WV 26041

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☐ **YES** ☒ **NO**
- If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**
- If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation: **THE WILLIAMS COMPANIES, INC.**

8. Does the applicant own, lease, have an option to buy, or otherwise have control of the *proposed site?* ☒ **YES** ☐ **NO**
- If **YES,** please explain: **APPLICANT OWNS THE PROPERTY**
- If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.):
SIC CODE 1389 - OIL AND GAS FIELD SERVICES, N.E.C.

10. North American Industry Classification System **(NAICS)** code for the facility:
213112 - SUPPORT ACTIVITIES FOR OIL AND GAS OPERATIONS

11A. DAQ Plant ID No. (existing facilities):
FRANCIS COMPRESSOR STATION (FCS): TBD
OAK GROVE GAS PLANT (OGGP): 051-00157

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (existing facilities):
OGGP: R13-3070 - ISSUED 07/12/13
OGGP: R13-3070A IS PENDING
OGGP: TITLE V OPERATING PERMIT IS PENDING

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

12A. Directions to the facility:

– For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;

– For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B.**

FROM LAFAYETTE AVE IN MOUNDSVILLE: A. HEAD EAST ONTO 12TH ST ~1.1 MI; B. CONTINUE ONTO FORK RIDGE RD ~5.4 MI; C. ENTRANCE TO SITE IS ON THE LEFT

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
NA	**MOUNDSVILLE**	**MARSHALL**
12.E. UTM Northing (KM):	12F. UTM Easting (KM):	12G. UTM Zone:
4,413.806 KM NORTHING	**526.243 KM EASTING**	**17S**

13. Briefly describe the proposed change(s) at the facility:

THIS APPLICATION IS PREPARED AND SUBMITTED TO PROVIDE FOR THE INSTALLATION AND OPERATION OF THE FOLLOWING EQUIPMENT AND OPERATIONS AT THE PROPOSED FRANCIS COMPRESSOR STATION:

- **ONE (1) 1,380 BHP CAT G3516B COMPRESSOR ENGINE W/ OXCAT** **CE-01/22E**
- **COMPRESSOR ROD PACKING AND ENGINE CRANKCASE LEAKS** **RPC-3/23E**
- **START/STOP/MAINTENANCE (INCLUDING BLOWDOWN)** **SSM-2/24E**
- **PIPING AND EQUIPMENT FUGITIVE EMISSIONS** **FUG-3/25E**

14A. Provide the date of anticipated installation or change:	14B. Date of anticipated Start-Up if a permit is granted:
APPROXIMATELY APRIL 1, 2016, OR AS SOON AS PERMIT IS ISSUED – If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: **NA**	**APPROXIMATELY APRIL 1, 2016, OR AS SOON AS PERMIT IS ISSUED**

14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
Hours Per Day: **24** Days Per Week: **7** Weeks Per Year: **52**

16. Is demolition or physical renovation at an existing facility involved? ☐ **YES** ☒ **NO**

17. **Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U.S. EPA Region III.

18. **Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known)*. A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known)*. Provide this information as **Attachment D.**

Section II. Additional attachments and supporting documents.

19. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

20. Include a **Table of Contents** as the first page of your application package.

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance*).**

– Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**

– Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**

– For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below:

☐ Bulk Liquid Transfer	☐ Haul Road Emissions	☐ Quarry
☐ Chemical Processes	☐ Hot Mix Asphalt Plant	☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Concrete Batch Plant	☐ Incinerator	
☐ Grey Iron and Steel Foundry	☐ Indirect Heat Exchanger	☐ Storage Tanks

☒ **General Emission Unit, specify:**

- **COMPRESSOR ENGINE EMISSIONS – 1,380 BHP CAT G3516B (CE-01/22E)**
- **PIPING AND EQUIPMENT FUGITIVES (FUG-3/25E)**

Fill out and provide the Emissions Unit Data Sheet(s) as **Attachment L.**

29. **Check all applicable Air Pollution Control Device Sheets listed below:**

☐ Absorption Systems	☐ Baghouse	☐ Flare
☐ Adsorption Systems	☐ Condenser	☐ Mechanical Collector
☐ Afterburner	☐ Electrostatic Precipitator	☐ Wet Collecting System

☒ **Other Collectors, specify:**

- **OXIDATION CATALYST (1-OXCAT) (FOR COMPRESSOR ENGINE (CE-01/22E))**

Fill out and provide the Air Pollution Control Device Sheet(s) as **Attachment M.**

30. **Provide all Supporting Emissions Calculations** as **Attachment N**, or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**

➢ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a Class I Legal Advertisement in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and *Example Legal Advertisement* for details). Please submit the Affidavit of Publication as **Attachment P** immediately upon receipt.

33. **Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☐ **YES** ☒ **NO**

➢ **If YES,** identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's *"Precautionary Notice – Claims of Confidentiality"* guidance found in the *General Instructions* as **Attachment Q.**

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable Authority Form below: **NA**

☐ Authority of Corporation or Other Business Entity	☐ Authority of Partnership
☐ Authority of Governmental Agency	☐ Authority of Limited Partnership

Submit completed and signed Authority Form as Attachment R.

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

7. Certification For Use Of Minor Modification Procedures *(Required Only for Minor Modification Requests)*

Note:	*This certification must be signed by a responsible official. Applications without a signed certification will be returned as incomplete. The criteria for allowing the use of Minor Modification Procedures are as follows:*

i. Proposed changes do not violate any applicable requirement;

ii. Proposed changes do not involve significant changes to existing monitoring, reporting, or recordkeeping requirements in the permit;

iii. Proposed changes do not require or change a case-by-case determination of an emission limitation or other standard, or a source-specific determination for temporary sources of ambient air quality impacts, or a visibility increment analysis;

iv. Proposed changes do not seek to establish or change a permit term or condition for which there is no underlying applicable requirement and which permit or condition has been used to avoid an applicable requirement to which the source would otherwise be subject (synthetic minor). Such terms and conditions include, but are not limited to a federally enforceable emissions cap used to avoid classification as a modification under any provision of Title I or any alternative emissions limit approved pursuant to regulations promulgated under § 112(j)(5) of the Clean Air Act;

v. Proposed changes do not involve preconstruction review under Title I of the Clean Air Act or 45CSR14 and 45CSR19;

vi. Proposed changes are not required under any rule of the Director to be processed as a significant modification;

Notwithstanding subparagraph 45CSR§30-6.5.a.1.A. (items i through vi above), minor permit modification procedures may be used for permit modifications involving the use of economic incentives, marketable permits, emissions trading, and other similar approaches, to the extent that such minor permit modification procedures are explicitly provided for in rules of the Director which are approved by the U.S. EPA as a part of the State Implementation Plan under the Clean Air Act, or which may be otherwise provided for in the Title V operating permit issued under 45CSR30.

Pursuant to 45CSR§30-6.5.a.2.C., the proposed modification contained herein meets the criteria for use of Minor permit modification procedures as set forth in Section 45CSR§30-6.5.a.1.A. The use of Minor permit modification procedures are hereby requested for processing of this application.

(Signed):	Paul V. Hunter *(Please use blue ink)*	Date:	03 / 03 / 16 *(Please use blue ink)*
Named (typed):	**Paul V. Hunter**	Title:	**General Manager Ohio River Supply Hub**

Note: Please check if the following included (if applicable):

☐	Compliance Assurance Monitoring Form(s)
☐	Suggested Title V Draft Permit Language

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

ATTACHMENT A

Business Certificate

"6. **West Virginia Business Registration.** Provide a copy of the Certificate of Authority/Authority of L.L.C./Registration (one page) including any name change amendments or other Business Certificate as Attachment A."

- **Certificate of Amendment to the Certificate of Authority**
  - From: CAIMAN EASTERN MIDSTREAM, LLC
  - To: WILLIAMS OHIO VALLEY MIDSTREAM LLC
  - Date: May 15, 2012

- **Certificate of Authority of a Foreign Limited Liability Company**
  - To: CAIMAN EASTERN MIDSTREAM, LLC
  - Date: September 11, 2009

State of West Virginia

Certificate

I, Natalie E. Tennant, Secretary of State of the State of West Virginia, hereby certify that

the attached true and exact copy of the Articles of Amendment to the Articles of Organization of

CAIMAN EASTERN MIDSTREAM, LLC

are filed in my office, signed and verified, as required by the provisions of West Virginia Code §31B-2-204 and conform to law. Therefore, I issue this

CERTIFICATE OF AMENDMENT TO THE CERTIFICATE OF AUTHORITY

changing the name of the limited liability company to

WILLIAMS OHIO VALLEY MIDSTREAM LLC

Given under my hand and the Great Seal of the State of West Virginia on this day of May 15, 2012

Natalie E Tennant

Secretary of State

State of West Virginia

Certificate

I, Natalie E. Tennant, Secretary of State of the State of West Virginia, hereby certify that

CAIMAN EASTERN MIDSTREAM, LLC

Control Number: 99GIS

a limited liability company, organized under the laws of the State of Texas

has filed its "Application for Certificate of Authority" in my office according to the provisions of West Virginia Code §31B-10-1002. I hereby declare the organization to be registered as a foreign limited liability company from its effective date of September 11, 2009, until a certificate of cancellation is filed with our office.

Therefore, I hereby issue this

CERTIFICATE OF AUTHORITY OF A FOREIGN LIMITED LIABILITY COMPANY

to the limited liability company authorizing it to transact business in West Virginia

Given under my hand and the Great Seal of the State of West Virginia on this day of September 11, 2009

Natalie E Tennant

Secretary of State

ATTACHMENT B

Map(s)

"12A. For **Modifications, Administrative Updates** or **Temporary** permits at an existing facility, please provide directions to the present location of the facility from the nearest state road. Include a MAP as Attachment B."

- **Location:**
  Oak Grove Gas Plant
  ~0.4 Miles North of 5258 Fork Ridge Rd
  ~3.7 Miles Southeast of Moundsville
  Moundsville, Marshall County, WV 26041

- **Latitude and Longitude:**
  39°52'26.03" North x -80°41'35.24" West
  39.8738° North x -80.6931° West

- **UTM:**
  526.243 km East x 4,413.806 km North x 17S

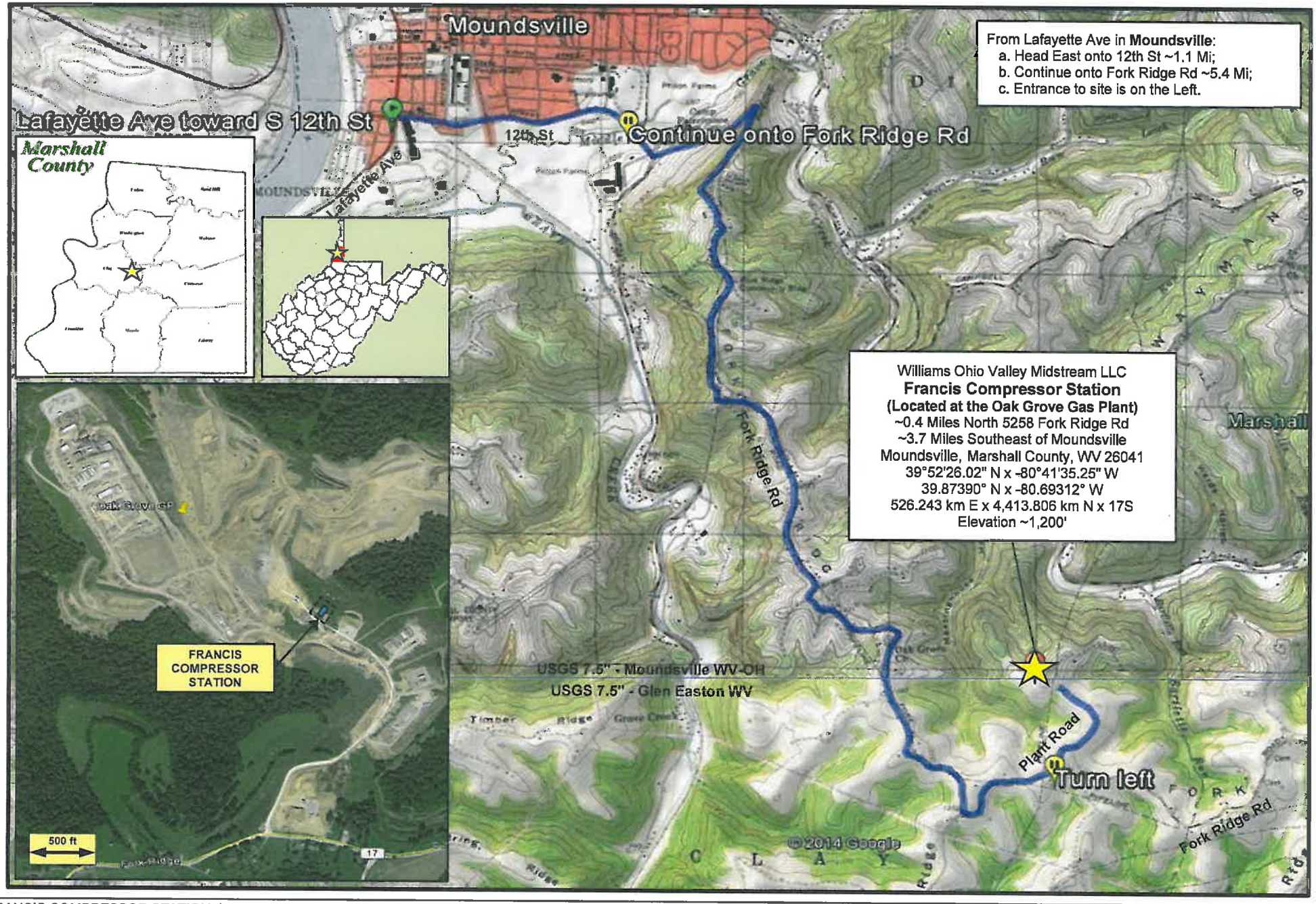
- **Elevation:**
  ~1,200'

- **Directions:**
  From Lafayette Ave in Moundsville:
  a. Head East onto 12th St ~1.1 Mi;
  b. Continue onto Fork Ridge Rd ~5.4 Mi;
  c. Entrance to site is on the left.

- **USGS:**
  7.5" Topographic – Moundsville WV-OH – 1997
  7.5" Topographic – Glen Easton WV – 1960

FRANCIS COMPRESSOR STATION
(Located at the Oak Grove Gas Plant)
Application for 45CSR13 NSR Construction Permit
Attachment B - Maps

LOCATION (TOPO) MAP



ATTACHMENT C

Installation and Start-Up Schedule

"14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as Attachment C."

The OVM Francis Compressor Station is a new facility to be constructed and operated at the existing OVM Oak Grove Gas Plant. Startup of the facility is anticipated to occur on April 1, 2016, or as soon as the permit is issued.

ATTACHMENT D

Regulatory Discussion

"18. **Regulatory Discussion**. List all Federal and State air pollution control regulations that you believe are applicable to the proposed process (if known). Discuss applicability and proposed demonstration(s) of compliance (if known). Provide this information as Attachment D."

- **Regulatory Discussion**
  - A. Applicability of New Source Review (NSR) Regulations
  - B. Applicability of Federal Regulations
  - C. Applicability of Source Aggregation
  - D. Applicability of State Regulations

Williams Ohio Valley Midstream LLC

FRANCIS COMPRESSOR STATION

Application for 45CSR13 NSR Construction Permit

Attachment D

REGULATORY DISCUSSION

A. Applicability of New Source Review (NSR) Regulations

The following New Source Review (NSR) regulations are potentially applicable to natural gas compressor stations. Applicability to the Francis Compressor Station (FCS), located at the Oak Grove Gas Plant (OGGP), has been determined as follows:

1. Prevention of Significant Deterioration (PSD) [Not Applicable]

This rule does not apply to the FCS or to the OGGP because the total PTE for the entire facility qualifies as a "PSD Minor Source" for each regulated pollutant; as follows:

- NOx: PSD Natural Minor Source with Pre-Controlled PTE < 250 tpy
- CO: PSD Natural Minor Source with Pre-Controlled PTE < 250 tpy
- VOC: PSD Natural Minor Source with Pre-Controlled PTE < 250 tpy
- SO2: PSD Natural Minor Source with Pre-Controlled PTE < 250 tpy
- PM10/2.5: PSD Natural Minor Source with Pre-Controlled PTE < 250 tpy

2. Non-Attainment New Source Review (NNSR) [Not Applicable]

This rule does not apply to the FCS or to the OGGP. The operations are in Marshall County which is designated as Non-Attainment for Sulfur Dioxide (SO2) and as Attainment/Unclassified/Maintenance for all other criteria pollutants. (As of 10/01/15, see - http://www3.epa.gov/airquality/greenbook/ancl.html.) The entire facility qualifies as an "NNSR Minor Source" as follows:

- SO2: NNSR Natural Minor Source with Pre-Controlled PTE < 100 tpy

3. Major Source of Hazardous Air Pollutants (HAPs) [Not Applicable]

This rule does not apply to the FCS or to the OGGP because the entire facility qualifies as a "HAP Area Source" as follows:

- Each HAP: HAP Area Source with Controlled Individual HAP PTE < 10 tpy
- Total HAPs: HAP Area Source with Controlled Total of All HAPs PTE < 25 tpy

4. Title V Operating Permit (TVOP) [Applicable]

This rule does apply. The application for the FCS operations is both an application for NSR permit and Title V Operating Permit revision to OGGP.

B. Applicability of Federal Regulations

The following federal regulations are potentially applicable to natural gas compressor stations. Applicability to the Francis Compressor Station (FCS), located at the Oak Grove Gas Plant (OGGP), has been determined as follows:

1. **NSPS A, General Provisions**
   40CFR§60.1-§60.19 [Applicable]

   This rule does apply to all sources subject to an NSPS (unless a specific provision is excluded within the source NSPS). Requirements include notification (§60.7); monitoring (§60.7); recordkeeping (§60.11); and reporting (§60.18).

2. **NSPS A, Control Devices - Flares**
   40CFR§60.18(b) [Not Applicable]

   This rule does not apply because there is no flare at the FCS.

3. **NSPS D (also Da, Db, and Dc), Steam Generating Units**
   40CFR§60.40-§60.48 [Not Applicable]

   These rules do not apply because there is no boiler (or heater) at the FCS.

4. **NSPS K (also Ka and Kb), Volatile Organic Liquid Storage Vessels**
   40CFR§60.40-§60.48 [Not Applicable]

   This rule does not apply because there is no tank with capacity ≥ 75 m3 (471.7 bbl or 19,813 gal) that is used to store volatile organic liquids (VOL) at the FCS (§60.110(a)).

5. **NSPS GG, Stationary Gas Turbines**
   40CFR§60.330-§60.335 [Not Applicable]

   This rule does not apply because there is no stationary gas turbine at the FCS (§60.330).

6. **NSPS KKK, Leaks from Natural Gas Processing Plants**
   40CFR§60.630-§60.636 [Not Applicable]

   This rule does not apply because the FCS, while located at the Oak Grove Gas Plant, commenced construction after 08/23/11 (§60.630(b)). (See NSPS OOOO.)

7. **NSPS LLL, Onshore Natural Gas Processing: SO2 Emissions**
   40CFR§60.640-§60.648 [Not Applicable]

   This rule does not apply because there is no gas sweetening operation at the FCS (§60.640(a)).

8. **NSPS IIII, Compression Ignition Reciprocating Internal Combustion Engines**
   40CFR§60.4200-§60.4219 [Not Applicable]

   This rule does not apply because there is no stationary compression ignition engine at the FCS (§60.4200(a)).

9. **NSPS JJJJ, Stationary Spark Ignition (SI) Internal Combustion Engines (ICE)**
40CFR§60.4230-§60.4248 [Applicable]

This rule does apply to the 1,380 bhp Caterpillar G3516B compressor engine (CE-01/22E) because the maximum engine power is greater than 500 HP and the engine was manufactured on or after 07/01/07 (§60.4230(a)(4)(i)).

Requirements include NOx, CO and VOC emission limits (§60.4233(e-f)); operating limits (§60.4243); performance testing (§60.4244); and notification and recordkeeping (§60.4245).

10. **NSPS KKKK, Stationary Combustion Turbines**
40CFR§60.4300-§60.4420 [Not Applicable]

This rule does not apply because there is no stationary combustion turbine at the FCS (§60.4300).

11. **NSPS OOOO, Crude Oil and Natural Gas Production**
40CFR§60.5360-§60.5430 [Applicable]

This rule does apply to the reciprocating compressor driven by the CAT G3516B engine (CE-01/22E) and the electric motor driven reciprocating compressor because the FCS is located within the natural gas production segment and the compressors commenced construction after 08/23/11 (§60.5360 and §60.5365(c)).

Requirements include replacing rod packing systems on a specified schedule (§60.5385(a)) and notification, monitoring, recordkeeping and reporting (§60.5410(c), §60.5415(c), §60.5420(b)(1) and §60.5420(b)(4)).

This rule does apply to continuous bleed natural gas-driven pneumatic controllers because the FCS is aggregated with the OGGP.

Requirements include utilizing compressed air or having a natural gas bleed rate of zero (§60.5390).

This rule does apply to sources of fugitive emissions because the FCS is aggregated with the OGGP.

Requirements include monitoring and repair of valves, flanges, connectors, pumps, pressure relief devices and open-ended valves or lines. The equipment leak standards are specified in §60.5400. Also subject to the notification, recordkeeping, and reporting as specified in §60.5420.

12. **NESHAP Part 61 - Designated Source Standards**
40CFR§61.01-§61.359 [Not Applicable]

This rule does not apply because the FCS is not a NESHAP Designated Facility (or Source).

13. NESHAP A (Part 63 (aka, MACT)) - General Provisions

40CFR§63.1§63.16 [Not Applicable]

This rule does not apply because the FCS is not subject to any requirements of the National Emissions Standards for Hazardous Air Pollutants (NESHAP) or associated Maximum Achievable Control Technology (MACT) requirements (§63.1(a)).

(Note: The Compressor Engine (CE-01/22E) complies with NESHAP ZZZZ by compliance with NSPS JJJJ (§63.6590(a)(2)(iii)), no other requirements apply.)

14. NESHAP HH, Oil and Natural Gas Production Facilities

40CFR§63.760-§63.779 [Not Applicable]

This rule does not apply because there is no triethylene glycol dehydrator at the FCS (§63.760(b)(2)).

This rule does not apply to storage vessels (tanks), compressors, or ancillary equipment because the FCS and the OGGP are an area source of HAP emissions (§63.760(b)(2)). In no case does this rule apply to engines or turbines.

15. NESHAP HHH, Natural Gas Transmission and Storage Facilities

40CFR§63.1270-§63.1289 [Not Applicable]

This rule does not apply because the FCS and the OGGP are not a natural gas transmission or storage facility transporting or storing natural gas prior to local distribution (§63.1270(a)).

16. NESHAP YYYY, Stationary Combustion Turbines

40CFR§63.6080-§63.6175 [Not Applicable]

This rule does not apply because there is no stationary gas turbine at the FCS (§63.6080).

17. NESHAP ZZZZ, Stationary Reciprocating Internal Combustion Engines (RICE)

40CFR§63.6580-§63.6675 [Applicable]

This rule does apply to the 1,380 bhp CAT G3516B Compressor Engine (CE-01/22E). It is "new"; i.e., commenced construction or reconstruction on or after 06/12/06 (§63.6590(a)(2)(iii)) so the only requirement is compliance with §60.4230-§60.4248 (NSPS JJJJ) for Spark Ignition Internal Combustion Engines.

18. NESHAP DDDDD, Industrial, Commercial, and Institutional Boilers and Process Heaters – Major Sources

40CFR§63.7480 – §63.7575 [Not Applicable]

This rule does not apply because there is no boiler or heater at the FCS (§63.7485).

19. NESHAP JJJJJJ, Industrial, Commercial, and Institutional Boilers and Process Heaters – Area Sources

40CFR§63.11193 – §63.11237 [Not Applicable]

This rule does not apply because there is no boiler or heater at the FCS (§63.11193).

20. Chemical Accident Prevention Provisions

40CFR§68.1-§68.220 [Not Applicable]

This rule does not apply because the FCS does not store more than a threshold quantity of a regulated substance in a process (§68.115).

21. Compliance Assurance Monitoring (CAM)

40CFR§64.1-§64.10 [Not Applicable]

This rule does not apply because there are no pollutant-specific emission units subject to an emissions limitation or standard (e.g., NSPS, NESHAP, HAP, NSR, PSD, SIP) with pre-controlled emissions greater than Title V major source thresholds, that requires an add-on control device to achieve compliance (§64.2(a)(2)).

22. Mandatory Greenhouse Gases (GHG) Reporting

40CFR§98.1-§98.9 [Potentially Applicable]

This rule does apply because the FCS has been aggregated with the OGGP and the combined operations is a listed source category and the combined heat input capacity of the stationary fuel combustion units is ≥ 30 MMBtu/hr (§98.2(a)).

C. Applicability of Source Aggregation

For New Source Review (NSR) and Title V permitting, the three-part regulatory criteria to determine whether emissions from two or more facilities should be aggregated and treated as a single source is whether the activities:

i) Belong to the same industrial grouping; and
ii) Are located on one or more contiguous or adjacent properties; and
iii) Are under control of the same person (or persons under common control).

i) Same Industrial Grouping

The subject facility shares the same two-digit major SIC code of 13 as the upstream gas production wells and other Williams' facilities.

ii) Contiguous or Adjacent

The determination of whether two or more facilities are "contiguous" or "adjacent" is made on a case-by-case basis. This determination is proximity based, and it is important to focus on this criterion and whether two contiguous or adjacent facilities, considered as a single source, meet the common sense notion of a plant. The functional interrelationship of the two or more facilities is not a relevant inquiry in determining whether the facilities are "contiguous" or "adjacent."

Neither West Virginia nor federal regulations define the terms "contiguous" or "adjacent." It is clear, however, that the determination of whether two or more facilities are "contiguous" or "adjacent" is based on the plain meaning of the terms "adjacent" and "contiguous", which consider the physical distance between the facilities. The term contiguous is defined in the dictionary as being in actual contact; touching along a boundary or at a point. The term adjacent" is defined in the dictionary as not distant, nearby, having a common endpoint or border.

The closest Williams-owned facility to the subject facility is the Oak Grove Gas Plant (OGGP) located next to Francis Compressor Station. The Oak Grove Gas Plant meets the common sense definition of being "contiguous" with or "adjacent" to the subject facility. There are no other Williams owned facilities (other than OGGP) located within ½ mile of Francis Compressor Station.

The subject facility compresses gas produced from upstream production wells located in northern West Virginia. The subject facility is located at the Oak Grove Gas Plant owned and operated by Williams Ohio Valley Midstream LLC.

The location of the subject facility was chosen because of suitable characteristics for construction and operation, such as the availability of a reasonably flat grade and accessibility for large trucks and equipment. Williams' business model is to construct scalable capacity that contemplates additional production from multiple operators and the initial configuration is merely a foundation for additional opportunities in the area. The subject facility does not need to be located in the immediate vicinity of the upstream wells in order to operate properly. Had suitable land been available elsewhere, the subject facility could have been located farther from the upstream wells and could theoretically be moved farther from the wells without affecting operations. Therefore, despite the fact that the subject facility is located in close proximity to one or many upstream production sources, aggregation of the subject facility with upstream wells does not meet the common sense notion of a plant.

iii) Common Control

Williams OVM operates under its parent company The Williams Companies, Inc. (Williams) and is the sole operator of the subject facility. The closest Williams-operated facility to the subject facility is the Oak Grove Gas Plant, located next to Francis Compressor Station. The OGGP is "contiguous" with or "adjacent" to the subject facility.

The production wells that send natural gas to the subject facility are owned and operated by other companies, which are unaffiliated with Williams. Williams has no ownership stake in any production well or company in West Virginia that may send natural gas to the subject facility.

Furthermore, neither Williams OVM, nor Williams, exercise operational control over any equipment owned or operated by any natural gas producer upstream of the subject facility. All employees at the subject facility are under the exclusive direction of Williams and are not under the control of any other entity. Similarly, Williams has no authority over employees of the production wells. These companies operate wholly independent of one another. No

employees are expected to shuttle back and forth between the subject facility and any production well.

At this time, contracts are in place for the subject facility to compress natural gas produced from multiple upstream production wells located throughout the region. As future commercial opportunities are identified, the subject facility will potentially receive gas from other producers. Williams will not have ownership or control of any future wellhead facilities. The producers are, and will be responsible for, any decisions to produce or shut-in wellhead facilities and have no control over the equipment installed, owned, and operated by Williams. Similarly, Williams cannot control the installation or operation of any equipment located at a well site that may be considered an air contamination source.

For the reason above, it is clear that Williams does not have common control of any upstream production wells.

Summary

The subject facility and the upstream production wells should not be aggregated and treated as a single source of emissions because the subject facility is not under common control with any of the upstream wells. Additionally, the subject facility and the upstream production wells, considered together, do not meet the common sense notion of a plant because the subject facility is expected to service multiple production wells and because the location of the facility was selected for reasons unrelated to the location of the production wells. Accordingly, the subject facility should not be aggregated with the upstream wells in determining major source or PSD status

However, as the Francis Compressor Station is considered "contiguous" or "adjacent" to the Oak Grove Gas Plant, and both facilities are owned and operated by Williams, these two facilities should be aggregated together for determining major source status.

D. Applicability of State Regulations

The following state regulations are potentially applicable to natural gas compressor stations. Applicability to the Francis Compressor Station (FCS), located at the Oak Grove Gas Plant (OGGP), has been determined as follows:

1. **Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers**
   45CSR2 [Not Applicable]

   This rule does not apply because there is no indirect heat exchanger at the FCS.

2. **Prevent and Control the Discharge of Air Pollutants into the Open Air which Causes or Contributes to an Objectionable Odor or Odors**
   45CSR4 [Applicable]

   This rule does apply and states that an objectionable odor is an odor that is deemed objectionable when in the opinion of a duly authorized representative of the Air Pollution Control Commission (Division of Air Quality), based upon their investigations and complaints, such odor is objectionable.

3. **Control of Air Pollution from Combustion of Refuse**
45CSR6 [Not Applicable]

This rule does not apply because there is no refuse combustion performed at the FCS.

4. **Prevent and Control Air Pollution from the Emission of Sulfur Oxides**
45CSR10 [Not Applicable]

This rule does not apply because there is no "fuel burning unit" at the FCS.

5. **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 [Applicable]

This rule does apply. Williams OVM is applying for a 45CSR13 New Source Review Construction Permit and has published the required Class I legal advertisement notifying the public of this application and paid the appropriate application fee.

6. **Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants for Prevention of Significant Deterioration**
45CSR14 [Not Applicable]

The rule does not apply because the FCS is neither a new PSD major source of pollutants nor is the proposed facility a modification to an existing PSD major source.

7. **Standards of Performance for New Stationary Sources Pursuant to 40 CFR Part 60**
45CSR16 [Applicable]

The rule does apply to this source by reference to §40CFR60 Subparts JJJJ and OOOO. The FCS is subject to the notification, testing, monitoring, recordkeeping and reporting requirements of these Subparts.

8. **Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment**
45CSR19 [Not Applicable]

This rule does not apply. The FCS location is designated as either "Maintenance" or "Attainment/Unclassified" for all criteria pollutants, except for sulfur dioxide. The plant-wide potential-to-emit (PTE) sulfur dioxide is less than applicable thresholds.

9. **Regulation of Volatile Organic Compounds (VOC)**
45CSR21 [Not Applicable]

This rule does not apply because the FCS is not located in Putnam County, Kanawha County, Cabell County, Wayne County, or Wood County

10. **Air Quality Management Fees Program**
45CSR22 [Applicable]

This rule does apply. It establishes a program to collect fees for certificates to operate and for permits to construct, modify or relocate sources of air pollution.

11. Prevent and Control Emissions of Toxic Air Pollutants
45CSR27 [Not Applicable]

This rule does not apply because equipment used in the production and distribution of petroleum products is exempt, provided that the product contains no more than 5% benzene by weight (§45-22-2.4).

12. Air Pollution Emissions Banking and Trading
45CSR28 [Not Applicable]
This rule does not apply. Williams Ohio Valley Midstream LLC does not choose to participate in the voluntarily statewide air pollutant emissions trading program.

13. Emission Statements for VOC and NOX
45CSR29 [Not Applicable]

This rule does not apply because FCS is not located in Putnam, Kanawha, Cabell, Wayne, Wood, or Greenbrier Counties (§45-29-1).

14. Requirements for Operating Permits
45CSR30 [Applicable]

This rule does apply. The application for the FCS operations is both an application for NSR permit and Title V Operating Permit revision to OGGP (§45-30-4.1.a.2).

15. Emission Standards for Hazardous Air Pollutants (HAP)
45CSR34 [Not Applicable]

This rule does not apply because the FCS is not subject to any requirements of the National Emissions Standards for Hazardous Air Pollutants (NESHAP) or associated Maximum Achievable Control Technology (MACT) requirements (§63.1(a)).

ATTACHMENT E

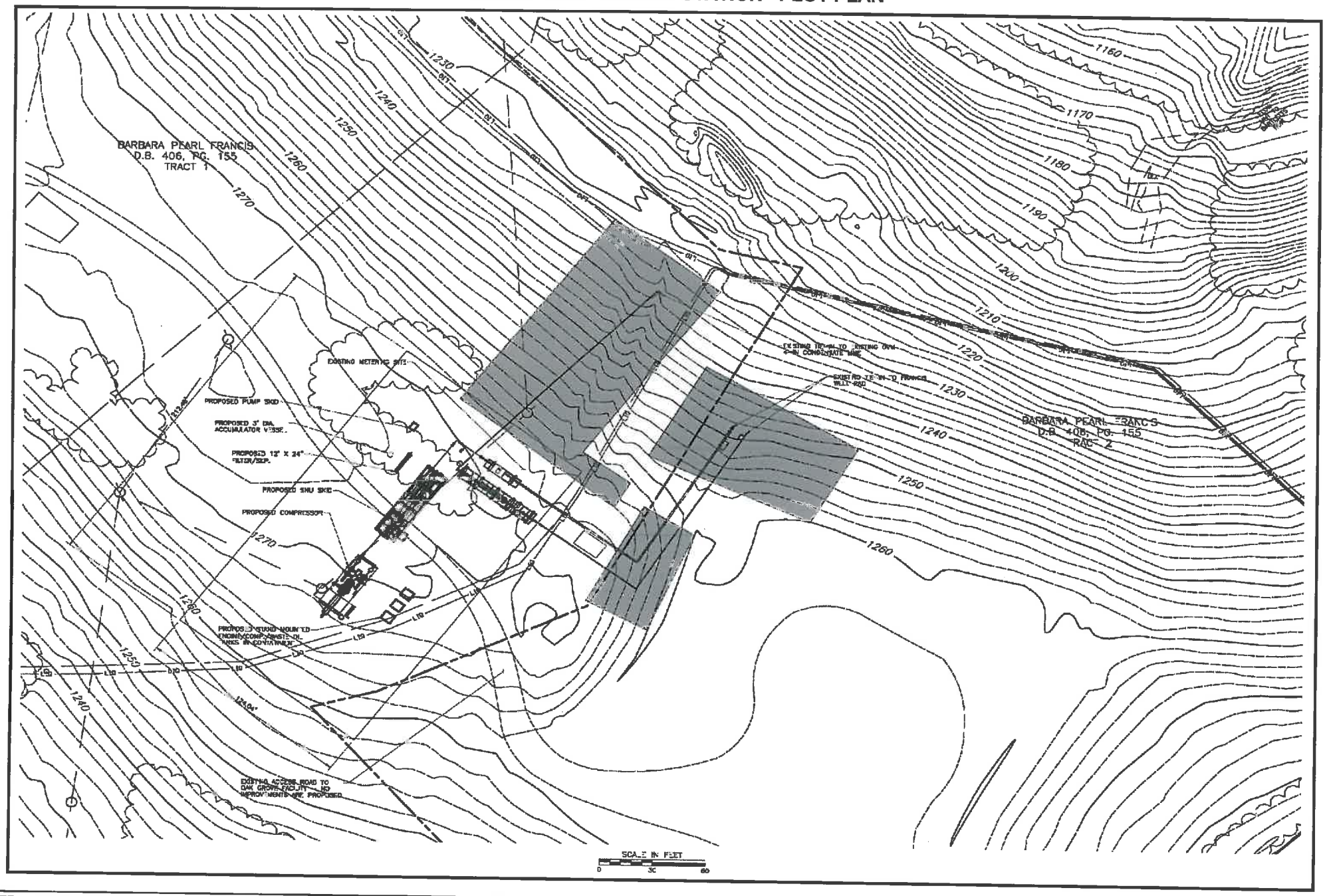
Plot Plan

"21. Provide a **Plot Plan**, e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as Attachment E."

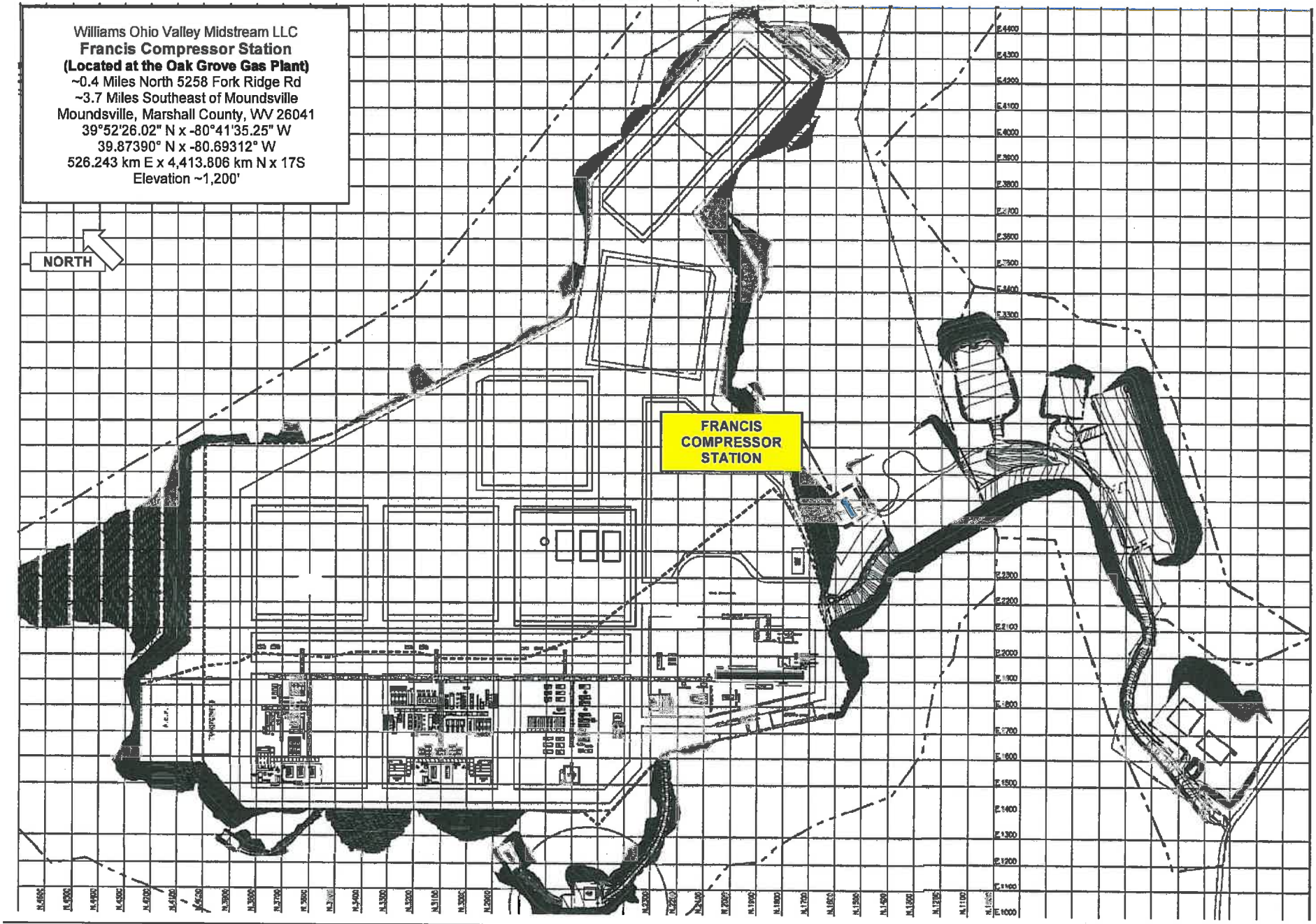
- Plot Plan – Francis Compressor Station
- Plot Plan – Oak Grove Gas Plant

FRANCIS COMPRESSOR STATION
(Located at the Oak Grove Gas Plant)
Application for 45CSR13 NSR Construction Permit
Attachment E - Plot Plan

FRANCIS COMPRESSOR STATION - PLOT PLAN



OAK GROVE GAS PLANT - PLOT PLAN



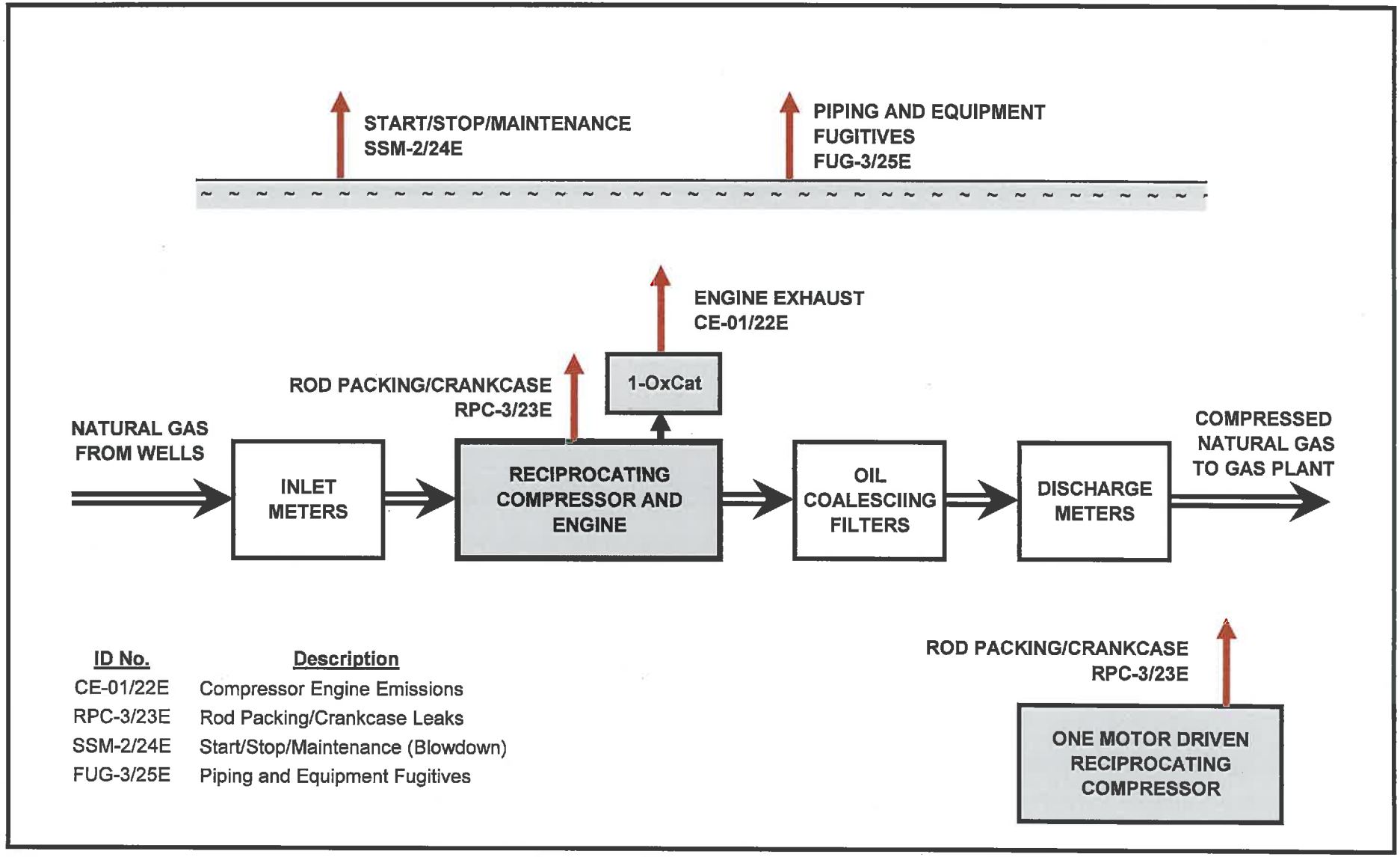
ATTACHMENT F

Detailed Process Flow Diagram(s) (PFD)

"22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as Attachment F."

- Process Flow Diagram (PFD) – Francis Compressor Station

PROCESS FLOW DIAGRAM (PFD)



ID No.	Description
CE-01/22E	Compressor Engine Emissions
RPC-3/23E	Rod Packing/Crankcase Leaks
SSM-2/24E	Start/Stop/Maintenance (Blowdown)
FUG-3/25E	Piping and Equipment Fugitives

ATTACHMENT G

Process Description

"23. Provide **a Process Description** as Attachment G. Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable). "

- **Process Description**
  - A. Project Overview
  - B. Compressor Engine Emissions – 1,380 bhp CAT G3516B (CE-01/22E)
  - C. Compressor Rod Packing and Engine Crankcase Leaks (RPC-3/23E)
  - D. Start/Stop/Maintenance (Including Blowdown) (SSM-2/24E)
  - E. Piping and Equipment Fugitives (FUG-3/25E)

Williams Ohio Valley Midstream LLC

FRANCIS COMPRESSOR STATION

Application for 45CSR13 Construction Permit

Attachment G

PROCESS DESCRIPTION

A. Project Overview

Williams Ohio Valley Midstream LLC proposes to construct and operate the Francis Compressor Station at the inlet of the existing Oak Grove Gas Plant, 5258 Fork Ridge Rd, in Moundsville, Marshall County, WV (See Appendix B – Site Location Map).

B. Compressor Engine Emissions – 1,380 bhp CAT G3516B (CE-01/22E)

One (1) natural gas-fueled CAT G3516B compressor engine is proposed at the facility. This will be a new, four stroke, lean burn (4SLB) engine w/ an oxidation catalyst (OxCat).

C. Compressor Rod Packing and Engine Crankcase Leaks (RPC-3/23E)

The compressors (engine and electric motor driven) and engine operations result in emissions from the wear of mechanical joints, seals, and rotating surfaces over time.

D. Start/Stop/Maintenance (Including Blowdown) (SSM-2/24E)

During routine operation the compressor engine will undergo periods of startup and shutdown. Often when the engine is shutdown, the natural gas contained within the compressor and associated piping is vented to the atmosphere. Similarly, the electric motor driven compressor will be blown down to atmosphere during periods of maintenance. Additionally, there will be other infrequent and (often) de-minimis emissions from various maintenance activities at the facility that are not necessarily associated with compressor blowdowns.

E. Piping and Equipment Fugitives (FUG-3/25E)

Piping and process equipment generate leaks from different component types (connectors, valves, pumps, etc.)

ATTACHMENT H

Material Safety Data Sheets (MSDS)
(And Representative Gas Analysis)

"24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as Attachment H. For chemical processes, provide a MSDS for each compound emitted to the air."

- **NATURAL GAS**
  - Representative Inlet Gas Analysis – Design Basis
  - Gas Analysis Summary – Design Basis

- **FLASH GAS**
  - Gas Analysis Summary – Design Basis

- **MATERIAL SAFETY DATA SHEETS (MSDS):**
  - Wellhead Natural Gas

Williams Ohio Valley Midstream LLC

FRANCIS COMPRESSOR STATION

Application for 45CSR13 NSR Construction Permit

Attachment H - MSDS (etc.)

Representative Inlet Gas Analysis - Design Basis

COMPOSITIONAL ANALYSIS OF THE SEPARATOR GAS, OIL AND MATHEMATICALLY RECOMBINED WELLSTREAM THROUGH C_{11+}

AB Resources, LLC
Cavenney No. 1-H

SEPARATOR GOR.....: 12809 Scf/Sep Bbl
SEPARATOR PRESSURE.....: 183 psig
SEPARATOR TEMPERATURE.....: 49 °F

	SEPARATOR GAS		SEPARATOR OIL		WELLSTREAM	
Component	Mole%	* GPM	Mole %	Liquid Volume %	Mole %	* GPM
Hydrogen Sulfide	0.000	0.000	0.000	0.000	0.000	0.000
Nitrogen	0.452	0.000	0.021	0.006	0.420	0.000
Carbon Dioxide	0.160	0.000	0.017	0.007	0.149	0.000
Methane	71.877	0.000	5.379	2.282	66.896	0.000
Ethane	17.518	4.723	8.784	5.880	16.864	4.547
Propane	6.744	1.871	12.655	8.716	7.187	1.994
Iso-butane	0.688	0.227	3.269	2.676	0.881	0.291
N-butane	1.672	0.531	11.633	9.175	2.418	0.768
2-2 Dimethylpropane	0.010	0.004	0.067	0.065	0.014	0.006
Iso-pentane	0.263	0.097	4.857	4.448	0.607	0.224
N-pentane	0.323	0.118	7.835	7.104	0.886	0.323
2-2 Dimethylbutane	0.005	0.002	0.143	0.149	0.015	0.006
Cyclopentane	0.002	0.001	0.000	0.000	0.002	0.001
2-3 Dimethylbutane	0.007	0.003	0.368	0.378	0.034	0.014
2 Methylpentane	0.046	0.019	2.187	2.272	0.206	0.086
3 Methylpentane	0.026	0.011	1.429	1.460	0.131	0.054
Other Hexanes	0.000	0.000	0.000	0.000	0.000	0.000
n-Hexane	0.065	0.027	4.457	4.587	0.394	0.163
Methylcyclopentane	0.006	0.002	0.404	0.358	0.036	0.013
Benzene	0.001	0.000	0.064	0.045	0.006	0.002
Cyclohexane	0.007	0.002	0.680	0.579	0.057	0.020
2-Methylhexane	0.011	0.005	1.419	1.651	0.116	0.055
3-Methylhexane	0.010	0.005	1.527	1.754	0.124	0.057
2,2,4 Trimethylpentane	0.000	0.000	0.000	0.000	0.000	0.000
Other Heptanes	0.009	0.004	1.202	1.309	0.098	0.043
n-Heptane	0.016	0.007	3.178	3.669	0.253	0.118
Methylcyclohexane	0.009	0.004	1.666	1.676	0.133	0.054
Toluene	0.002	0.001	0.318	0.267	0.026	0.009
Other C-8's	0.018	0.009	4.694	5.507	0.368	0.174
n-Octane	0.008	0.004	2.037	2.611	0.160	0.083
Ethylbenzene	0.001	0.000	0.291	0.281	0.023	0.009
M&P-Xylene	0.003	0.001	0.279	0.271	0.024	0.009
O-Xylene	0.001	0.000	0.602	0.573	0.046	0.018
Other C-9's	0.017	0.009	2.861	3.749	0.230	0.121
n-Nonane	0.006	0.003	1.268	1.786	0.101	0.057
Other C10's	0.012	0.007	2.882	4.150	0.227	0.132
n-Decane	0.002	0.001	0.797	1.224	0.062	0.038
Undecanes Plus	0.003	0.002	10.728	19.334	0.806	0.585
TOTAL	100.000	7.701	100.000	100.000	100.000	10.072

Williams Ohio Valley Midstream LLC

FRANCIS COMPRESSOR STATION

Application for 45CSR13 NSR Construction Permit

Attachment H - MSDS (etc.)

Gas Analysis Summary - Design Basis

Component	CAS	Formula	Molecular Weight	Mole % (Vol %)	Mole Fraction	Weighted Sum	Weight %	lb/MMscf
Nitrogen	7727-37-9	N2	32.00	0.452	0.00452	0.145	0.654	381.14
Hydrogen Sulfide	2148-87-8	H2S	34.08	---	---	---	---	---
Carbon Dioxide	124-38-9	CO2	44.01	0.160	0.00160	0.070	0.318	185.56
Methane*	75-82-8	CH4	16.04	71.877	0.71877	11.531	52.109	30,385.73
Ethane*	74-84-0	C2H6	30.07	17.518	0.17518	5.267	23.804	13,880.75
Propane**	74-98-6	C3H8	44.10	6.744	0.06744	2.974	13.439	7,836.49
i-Butane**	75-28-5	C4H10	58.12	0.688	0.00688	0.400	1.807	1,053.75
n-Butane**	106-97-8	C4H10	58.12	1.674	0.01674	0.973	4.398	2,564.54
Cyclopentane**	287-92-3	C5H10	70.13	0.002	0.00002	0.001	0.006	3.70
i-Pentane**	78-78-4	C5H12	72.15	0.263	0.00263	0.190	0.857	500.03
n-Pentane**	109-66-0	C5H12	72.15	0.323	0.00323	0.233	1.053	614.10
Cyclohexane**	110-82-7	C6H12	84.16	0.007	0.00007	0.006	0.027	15.52
Other Hexanes**	varies	C6H14	86.18	---	---	---	---	---
Methylcyclohexane**	varies	C7H14	98.19	0.009	0.00009	0.009	0.040	23.29
Heptanes**	varies	C7H16	100.20	0.025	0.00025	0.025	0.113	66.01
C8+ Heavies**	varies	C8H18+	130.3 est	0.184	0.00184	0.239	1.081	630.27
Benzene***	71-43-2	C6H6	78.11	0.001	0.00001	0.001	0.004	2.06
Ethylbenzene***	100-41-4	C8H10	106.17	0.001	0.00001	0.001	0.005	2.80
n-Hexane***	110-54-3	C6H14	86.18	0.065	0.00065	0.056	0.253	147.61
Toluene***	108-88-3	C7H8	92.14	0.002	0.00002	0.002	0.008	4.86
2,2,4-TMP (i-Octane)***	540-84-1	C8H18	114.23	0.001	0.00001	0.001	0.005	3.01
Xylenes***	1330-20-7	C8H10	106.17	0.004	0.00004	0.004	0.019	11.19
Totals:				**100.00**	**1.00**	**22.13**	**100.00**	**58,312**
Total THC:				**99.39**	**0.99**	**21.91**	**99.03**	**57,746**
Total VOC:				**9.99**	**0.10**	**5.12**	**23.12**	**13,479**
Total HAP:				**0.07**	**0.001**	**0.07**	**0.29**	**172**

* = Hydrocarbon (HC) ** = also Volatile Organic Compound (VOC) *** = also Hazardous Air Pollutant (HAP)

#UGC (Universal Gas Constant) = 379.482 scf/lb-mol @ 60 °F and 14.696 psia. Pound "X"/scf = M% of "X" * MW of "X" / UGC

To be conservative, and to account for potential future changes in the gas quality, the following "worst-case" values were assumed:

Component	CAS	Formula	Representative Gas Analysis			Worst-Case (120% Min)		
			Mole %	Wgt %	lb/MMscf	Mole %	Wgt %	lb/MMscf
Carbon Dioxide	124-38-9	CO2	0.160	0.318	186	0.259	0.514	300
Methane	75-82-8	CH4	71.877	52.109	30,386	86.340	62.594	36,500
Ethane	74-84-0	C2H6	17.518	23.804	13,881	1.169	8.596	4,446
VOC	Various	C3+	9.993	23.116	13,479	12.232	28.296	16,500
Benzene	71-43-2	C6H6	0.001	0.004	2	0.010	0.034	20
Ethylbenzene	110-54-3	C8H10	0.001	0.005	3	0.007	0.034	20
n-Hexane	100-41-4	C6H14	0.065	0.253	148	0.088	0.343	200
Toluene	108-88-3	C7H8	0.002	0.008	5	0.008	0.034	20
2,2,4-TMP (i-Octane)	540-84-1	C8H18	0.001	0.005	3	0.007	0.034	20
Xylenes	1330-20-7	C8H10	0.004	0.019	11	0.007	0.034	20
Total HAP	Various	C6+	0.074	0.294	172	0.129	0.514	300

Williams Ohio Valley Midstream LLC

FRANCIS COMPRESSOR STATION

Application for 45CSR13 NSR Construction Permit

Attachment H - MSDS (etc.)

Flash Gas Analysis Summary - Design Basis

Component	CAS	Formula	Molecular Weight	Mole % (Vol %)	Mole Fraction	Weighted Sum	Weight %	lb/MMscf
Water	---	H2O	18	0.327	0.0033	0.059	0.191	155.11
Nitrogen	7727-37-9	N2	32.00	0.092	0.00092	0.029	0.095	77.43
Hydrogen Sulfide	2148-87-8	H2S	34.08	---	---	---	---	---
Carbon Dioxide	124-38-9	CO2	44.01	0.204	0.00204	0.090	0.292	236.99
Methane*	75-82-8	CH4	16.04	37.130	0.37132	5.957	19.315	15,697.49
Ethane*	74-84-0	C2H6	30.07	32.298	0.32300	9.712	31.492	25,593.45
Propane**	74-98-6	C3H8	44.10	20.122	0.20123	8.873	28.772	23,382.81
i-Butane**	75-28-5	C4H10	58.12	2.204	0.02204	1.281	4.153	3,375.43
n-Butane**	106-97-8	C4H10	58.12	5.326	0.05326	3.096	10.038	8,157.60
Cyclopentane**	287-92-3	C5H10	70.13	---	---	---	---	---
i-Pentane**	78-78-4	C5H12	72.15	0.807	0.00807	0.583	1.889	1,534.99
n-Pentane**	109-66-0	C5H12	72.15	0.973	0.00973	0.702	2.277	1,850.24
Cyclohexane**	110-82-7	C6H12	84.16	0.033	0.00033	0.028	0.090	73.00
Other Hexanes**	varies	C6H14	86.18	0.205	0.00205	0.176	0.572	464.55
Methylcyclohexane**	varies	C7H14	98.19	0.019	0.00019	0.019	0.061	49.21
Heptanes**	varies	C7H16	100.20	0.079	0.00079	0.079	0.256	207.80
C8+ Heavies**	varies	C8H18+	130.3 est	0.010	0.00010	0.013	0.044	35.47
Benzene***	71-43-2	C6H6	78.11	0.002	0.00002	0.002	0.006	5.10
Ethylbenzene***	100-41-4	C8H10	106.17	0.001	0.00001	0.001	0.003	2.57
n-Hexane***	110-54-3	C6H14	86.18	0.157	0.00157	0.135	0.439	356.70
Toluene***	108-88-3	C7H8	92.14	0.003	0.00003	0.003	0.009	7.59
2,2,4-TMP (i-Octane)***	540-84-1	C8H18	114.23	0.000	---	---	---	---
Xylenes***	1330-20-7	C8H10	106.17	0.002	0.00002	0.002	0.007	6.06
Totals:				**99.99**	**1.00**	**30.84**	**100.00**	**81,270**
Total THC:				**99.37**	**0.99**	**30.66**	**99.42**	**80,800**
Total VOC:				**29.94**	**0.30**	**14.99**	**48.61**	**39,509**
Total HAP:				**0.17**	**0.002**	**0.14**	**0.47**	**378**

* = Hydrocarbon (HC) ** = also Volatile Organic Compound (VOC) *** = also Hazardous Air Pollutant (HAP)

To be conservative, and to account for potential future changes in the gas quality, the following "worst-case" values were assumed:

Component	CAS	Formula	Representative Gas Analysis			Worst-Case (120% Min)		
			Mole %	Wgt %	lb/MMscf	Mole %	Wgt %	lb/MMscf
Carbon Dioxide	124-38-9	CO2	0.204	0.292	237	0.259	0.369	300
Methane	75-82-8	CH4	37.130	19.315	15,697	44.705	23.256	18,900
Ethane	74-84-0	C2H6	32.298	31.492	25,593	19.037	17.927	14,100
VOC	Various	C3+	29.943	48.615	39,509	35.999	58.447	47,500
Benzene	71-43-2	C6H6	0.002	0.006	5	0.010	0.025	20
Ethylbenzene	110-54-3	C8H10	0.001	0.003	3	0.007	0.025	20
n-Hexane	100-41-4	C6H14	0.157	0.439	357	0.264	0.738	600
Toluene	108-88-3	C7H8	0.003	0.009	8	0.008	0.025	20
2,2,4-TMP (i-Octane)	540-84-1	C8H18	0.000	---	---	0.007	0.025	20
Xylenes	1330-20-7	C8H10	0.002	0.007	6	0.007	0.025	20
Total HAP	Various	C6+	0.166	0.465	378	0.307	0.861	700

Flash Gas Analysis Summary - Design Basis

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Revision Date: 10/02/2013 Version: 1.0

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

Product Identifier

Product Form: Mixture

Product Name: Wellhead Natural Gas

Synonyms: Wellhead Gas, Raw Gas, Methane, Residue Gas, Natural Gas Sweet, Marsh Gas, Fuel Gas, Petroleum Gas.

Intended Use of the Product

Use of the Substance/Mixture: Fuel.

Name, Address, and Telephone of the Responsible Party

Company

Williams, Inc.
One Williams Center
Tulsa, OK 74172, US
T 800-688-7507
enterpriseehs@williams.com

Emergency Telephone Number

Emergency number : 800-424-9300

SECTION 2: HAZARDS IDENTIFICATION

Classification of the Substance or Mixture

Classification (GHS-US)

Simple Asphy
Flam. Gas 1 H220
Compressed gas H280

Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US) :

GHS02 GHS04

Signal Word (GHS-US) : Danger

Hazard Statements (GHS-US) : H220 - Extremely flammable gas
H280 - Contains gas under pressure; may explode if heated
May displace oxygen and cause rapid suffocation

Precautionary Statements (GHS-US) : P210 - Keep away from heat, sparks, open flames, hot surfaces. - No smoking.
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 - Eliminate all ignition sources if safe to do so.
P403 - Store in a well-ventilated place.
P410+P403 - Protect from sunlight. Store in a well-ventilated place.

Other Hazards

Other Hazards Not Contributing to the Classification: Contains hydrogen sulfide. Hydrogen sulfide is a highly flammable, explosive gas under certain conditions, is a toxic gas, and may be fatal. Gas can accumulate in the headspace of closed containers, use caution when opening sealed containers. Heating the product or containers can cause thermal decomposition of the product and release hydrogen sulfide. Exposure may aggravate those with pre existing eye, skin, or respiratory conditions.

Unknown Acute Toxicity (GHS-US) Not available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

Name	Product identifier	% (w/w)	Classification (GHS-US)
Methane	(CAS No) 74-82-8	> 75	Simple Asphy

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			Flam. Gas 1, H220 Liquefied gas, H280
Ethane	(CAS No) 74-84-0	< 20	Simple Asphy Flam. Gas 1, H220 Liquefied gas, H280
Propane	(CAS No) 74-98-6	< 10	Simple Asphy Flam. Gas 1, H220 Liquefied gas, H280
Carbon dioxide	(CAS No) 124-38-9	< 10	Simple Asphy Compressed gas, H280
Butane	(CAS No) 106-97-8	< 5	Simple Asphy Flam. Gas 1, H220 Liquefied gas, H280
Nitrogen	(CAS No) 7727-37-9	< 5	Simple Asphy Compressed gas, H280
Hydrogen sulfide	(CAS No) 7783-06-4	<= 0.0004	Flam. Gas 1, H220 Liquefied gas, H280 Acute Tox. 2 (Inhalation:gas), H330 Aquatic Acute 1, H400

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

Description of First Aid Measures

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible). If frostbite or freezing occurs, immediately flush with plenty of lukewarm water to GENTLY warm the affected area. Do not use hot water. Do not rub affected area. Get immediate medical attention.

Inhalation: When symptoms occur: go into open air and ventilate suspected area.Remove to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER/doctor/physician if you feel unwell

Skin Contact: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation persists.Thaw frosted parts with lukewarm water. Do not rub affected area.

Eye Contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.Obtain medical attention if irritation persists

Ingestion: Rinse mouth.Do NOT induce vomiting.Get immediate medical attention.

Most Important Symptoms and Effects Both Acute and Delayed

General: May cause frostbite on contact with the liquid.Butane is an asphyxiant. Lack of oxygen can be fatal

Inhalation: Gas can be toxic as a simple asphyxiant by displacing oxygen from the air.Asphyxia by lack of oxygen: risk of death.May cause drowsiness or dizziness

Skin Contact: Contact with the liquid may cause cold burns/frostbite

Eye Contact: This gas is non-irritating; but direct contact with liquefied/pressurized gas or frost particles may produce severe and possibly permanent eye damage from freeze burns

Ingestion: Ingestion is not considered a potential route of exposure. Non-irritating; but solid and liquid forms of this material and pressurized gas may cause freeze burns.

Chronic Symptoms: Contains a small amount of Hydrogen Sulfide, symptoms of overexposure are headaches, dizziness, nausea, coughing, respiratory irritation, eye irritation, skin irritation, pain in the nose, and loss of consciousness. Heating of the product may release higher amounts of Hydrogen Sulfide (H_2S).

Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention.

SECTION 5: FIREFIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Foam, dry chemical, carbon dioxide, water spray, fog

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire

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Special Hazards Arising From the Substance or Mixture

Fire Hazard: Extremely flammable gas

Explosion Hazard: May form flammable/explosive vapor-air mixture.Heating may cause an explosion.Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries.

Reactivity: Hazardous reactions will not occur under normal conditions.

Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire

Firefighting Instructions: Leaking gas fire: Do not extinguish, unless leak can be stopped safely.In case of leaking gas fire, eliminate all ignition sources if safe to do so.Use water spray or fog for cooling exposed containers.In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Hazardous Combustion Products: Carbon oxides (CO, CO_2).Hydrocarbon, sulfur dioxide (SO_2), and Hydrogen sulfide (H_2S) fatal and irritating gases

Other information: Do not allow run-off from fire fighting to enter drains or water courses

Reference to Other Sections

Refer to section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Use special care to avoid static electric charges.Eliminate every possible source of ignition.Keep away from heat/sparks/open flames/hot surfaces - No smoking.Avoid breathing (dust, vapor, mist, gas).Use only outdoors or in a well-ventilated area.Ruptured cylinders may rocket.Do not allow product to spread into the environment

For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Ventilate area.

Environmental Precautions

Prevent entry to sewers and public waters.Avoid release to the environment

Methods and Material for Containment and Cleaning Up

For Containment: Notify authorities if liquid enters sewers or public waters.Use only non-sparking tools

Methods for Cleaning Up: Clear up spills immediately and dispose of waste safely.Isolate area until gas has dispersed.Use water spray to disperse vapors.For water based spills contact appropriate authorities and abide by local regulations for hydrocarbon spills into waterways.Contact competent authorities after a spill

Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection.

SECTION 7: HANDLING AND STORAGE

Precautions for Safe Handling

Additional Hazards When Processed: Handle empty containers with care because residual vapors are flammable.Extremely flammable gas.Do not pressurize, cut, or weld containers. Do not puncture or incinerate container.Liquid gas can cause frost-type burns. If stored under heat for extended periods or significantly agitated, this material might evolve or release hydrogen sulfide, a toxic, flammable gas, which can raise and widen this material's actual flammability limits and significantly lower its auto-ignition temperature. Hydrogen sulfide can be fatal.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures.Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.Do no eat, drink or smoke when using this product

Technical Measures: Proper grounding procedures to avoid static electricity should be followed.Comply with applicable regulations.

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Storage Conditions: Store in a dry, cool and well-ventilated place.Keep container closed when not in use. Keep in fireproof place.Store in a well-ventilated place. Keep container tightly closed.Keep/Store away from extremely high or low temperatures, ignition sources, direct sunlight, incompatible materials. Store in original container.

Incompatible Materials: strong acids,Strong bases,Strong oxidizers,chlorine,Halogenated compounds

Conditions for Safe Storage, Including Any Incompatibilities Not available

Specific End Use(s)

Fuel.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

Hydrogen sulfide (7783-06-4)		
USA ACGIH	ACGIH TWA (ppm)	1 ppm
USA ACGIH	ACGIH STEL (ppm)	5 ppm
USA OSHA	OSHA PEL (Ceiling) (ppm)	20 ppm
USA NIOSH	NIOSH REL (ceiling) (mg/m3)	15 mg/m³
USA NIOSH	NIOSH REL (ceiling) (ppm)	10 ppm
USA IDLH	US IDLH (ppm)	100 ppm
Alberta	OEL Ceiling (mg/m³)	21 mg/m³
Alberta	OEL Ceiling (ppm)	15 ppm
Alberta	OEL TWA (mg/m³)	14 mg/m³
Alberta	OEL TWA (ppm)	10 ppm
British Columbia	OEL Ceiling (ppm)	10 ppm
Manitoba	OEL STEL (ppm)	5 ppm
Manitoba	OEL TWA (ppm)	1 ppm
New Brunswick	OEL STEL (mg/m³)	21 mg/m³
New Brunswick	OEL STEL (ppm)	15 ppm
New Brunswick	OEL TWA (mg/m³)	14 mg/m³
New Brunswick	OEL TWA (ppm)	10 ppm
Newfoundland & Labrador	OEL STEL (ppm)	5 ppm
Newfoundland & Labrador	OEL TWA (ppm)	1 ppm
Nova Scotia	OEL STEL (ppm)	5 ppm
Nova Scotia	OEL TWA (ppm)	1 ppm
Nunavut	OEL Ceiling (mg/m³)	28 mg/m³
Nunavut	OEL Ceiling (ppm)	20 ppm
Nunavut	OEL STEL (mg/m³)	21 mg/m³
Nunavut	OEL STEL (ppm)	15 ppm
Nunavut	OEL TWA (mg/m³)	14 mg/m³
Nunavut	OEL TWA (ppm)	10 ppm
Northwest Territories	OEL Ceiling (mg/m³)	28 mg/m³
Northwest Territories	OEL Ceiling (ppm)	20 ppm
Northwest Territories	OEL STEL (mg/m³)	21 mg/m³
Northwest Territories	OEL STEL (ppm)	15 ppm
Northwest Territories	OEL TWA (mg/m³)	14 mg/m³
Northwest Territories	OEL TWA (ppm)	10 ppm
Ontario	OEL STEL (ppm)	15 ppm
Ontario	OEL TWA (ppm)	10 ppm
Prince Edward Island	OEL STEL (ppm)	5 ppm
Prince Edward Island	OEL TWA (ppm)	1 ppm
Québec	VECD (mg/m³)	21 mg/m³
Québec	VECD (ppm)	15 ppm

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Québec	VEMP (mg/m³)	14 mg/m³
Québec	VEMP (ppm)	10 ppm
Saskatchewan	OEL STEL (ppm)	15 ppm
Saskatchewan	OEL TWA (ppm)	10 ppm
Yukon	OEL STEL (mg/m³)	27 mg/m³
Yukon	OEL STEL (ppm)	15 ppm
Yukon	OEL TWA (mg/m³)	15 mg/m³
Yukon	OEL TWA (ppm)	10 ppm

Propane (74-98-6)		
USA ACGIH	ACGIH TWA (ppm)	1000 ppm
USA OSHA	OSHA PEL (TWA) (mg/m3)	1800 mg/m³
USA OSHA	OSHA PEL (TWA) (ppm)	1000 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m3)	1800 mg/m³
USA NIOSH	NIOSH REL (TWA) (ppm)	1000 ppm
USA IDLH	US IDLH (ppm)	2100 ppm (10% LEL)
Alberta	OEL TWA (ppm)	1000 ppm
British Columbia	OEL TWA (ppm)	1000 ppm
Manitoba	OEL TWA (ppm)	1000 ppm
Newfoundland & Labrador	OEL TWA (ppm)	1000 ppm
Nova Scotia	OEL TWA (ppm)	1000 ppm
Ontario	OEL TWA (ppm)	1000 ppm
Prince Edward Island	OEL TWA (ppm)	1000 ppm
Québec	VEMP (mg/m³)	1800 mg/m³
Québec	VEMP (ppm)	1000 ppm
Saskatchewan	OEL STEL (ppm)	1250 ppm
Saskatchewan	OEL TWA (ppm)	1000 ppm

Butane (106-97-8)		
USA ACGIH	ACGIH TWA (ppm)	1000 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m3)	1900 mg/m³
USA NIOSH	NIOSH REL (TWA) (ppm)	800 ppm
Alberta	OEL TWA (ppm)	1000 ppm
British Columbia	OEL STEL (ppm)	750 ppm
British Columbia	OEL TWA (ppm)	600 ppm
Manitoba	OEL TWA (ppm)	1000 ppm
New Brunswick	OEL TWA (mg/m³)	1900 mg/m³
New Brunswick	OEL TWA (ppm)	800 ppm
Newfoundland & Labrador	OEL TWA (ppm)	1000 ppm
Nova Scotia	OEL TWA (ppm)	1000 ppm
Nunavut	OEL STEL (mg/m³)	2576 mg/m³
Nunavut	OEL STEL (ppm)	1000 ppm
Nunavut	OEL TWA (mg/m³)	1901 mg/m³
Nunavut	OEL TWA (ppm)	800 ppm
Northwest Territories	OEL STEL (mg/m³)	2576 mg/m³
Northwest Territories	OEL STEL (ppm)	1000 ppm
Northwest Territories	OEL TWA (mg/m³)	1901 mg/m³
Northwest Territories	OEL TWA (ppm)	800 ppm
Ontario	OEL TWA (ppm)	800 ppm
Prince Edward Island	OEL TWA (ppm)	1000 ppm
Québec	VEMP (mg/m³)	1900 mg/m³

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Québec	VEMP (ppm)	800 ppm
Saskatchewan	OEL STEL (ppm)	1250 ppm
Saskatchewan	OEL TWA (ppm)	1000 ppm
Yukon	OEL STEL (mg/m³)	1600 mg/m³
Yukon	OEL STEL (ppm)	750 ppm
Yukon	OEL TWA (mg/m³)	1400 mg/m³
Yukon	OEL TWA (ppm)	600 ppm

Carbon dioxide (124-38-9)		
USA ACGIH	ACGIH TWA (ppm)	5000 ppm
USA ACGIH	ACGIH STEL (ppm)	30000 ppm
USA OSHA	OSHA PEL (TWA) (mg/m3)	9000 mg/m³
USA OSHA	OSHA PEL (TWA) (ppm)	5000 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m3)	9000 mg/m³
USA NIOSH	NIOSH REL (TWA) (ppm)	5000 ppm
USA NIOSH	NIOSH REL (STEL) (mg/m3)	54000 mg/m³
USA NIOSH	NIOSH REL (STEL) (ppm)	30000 ppm
USA IDLH	US IDLH (ppm)	40000 ppm
Alberta	OEL STEL (mg/m³)	54000 mg/m³
Alberta	OEL STEL (ppm)	30000 ppm
Alberta	OEL TWA (mg/m³)	9000 mg/m³
Alberta	OEL TWA (ppm)	5000 ppm
British Columbia	OEL STEL (ppm)	15000 ppm
British Columbia	OEL TWA (ppm)	5000 ppm
Manitoba	OEL STEL (ppm)	30000 ppm
Manitoba	OEL TWA (ppm)	5000 ppm
New Brunswick	OEL STEL (mg/m³)	54000 mg/m³
New Brunswick	OEL STEL (ppm)	30000 ppm
New Brunswick	OEL TWA (mg/m³)	9000 mg/m³
New Brunswick	OEL TWA (ppm)	5000 ppm
Newfoundland & Labrador	OEL STEL (ppm)	30000 ppm
Newfoundland & Labrador	OEL TWA (ppm)	5000 ppm
Nova Scotia	OEL STEL (ppm)	30000 ppm
Nova Scotia	OEL TWA (ppm)	5000 ppm
Nunavut	OEL STEL (mg/m³)	27000 mg/m³
Nunavut	OEL STEL (ppm)	15000 ppm
Nunavut	OEL TWA (mg/m³)	9000 mg/m³
Nunavut	OEL TWA (ppm)	5000 ppm
Northwest Territories	OEL STEL (mg/m³)	27000 mg/m³
Northwest Territories	OEL STEL (ppm)	15000 ppm
Northwest Territories	OEL TWA (mg/m³)	9000 mg/m³
Northwest Territories	OEL TWA (ppm)	5000 ppm
Ontario	OEL STEL (ppm)	30000 ppm
Ontario	OEL TWA (ppm)	5000 ppm
Prince Edward Island	OEL STEL (ppm)	30000 ppm
Prince Edward Island	OEL TWA (ppm)	5000 ppm
Québec	VECD (mg/m³)	54000 mg/m³
Québec	VECD (ppm)	30000 ppm
Québec	VEMP (mg/m³)	9000 mg/m³
Québec	VEMP (ppm)	5000 ppm
Saskatchewan	OEL STEL (ppm)	30000 ppm

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Saskatchewan	OEL TWA (ppm)	5000 ppm
Yukon	OEL STEL (mg/m³)	27000 mg/m³
Yukon	OEL STEL (ppm)	15000 ppm
Yukon	OEL TWA (mg/m³)	9000 mg/m³
Yukon	OEL TWA (ppm)	5000 ppm

Nitrogen (7727-37-9)		

Methane (74-82-8)		
USA ACGIH	ACGIH TWA (ppm)	1000 ppm
British Columbia	OEL TWA (ppm)	1000 ppm
Manitoba	OEL TWA (ppm)	1000 ppm
Newfoundland & Labrador	OEL TWA (ppm)	1000 ppm
Nova Scotia	OEL TWA (ppm)	1000 ppm
Ontario	OEL TWA (ppm)	1000 ppm
Prince Edward Island	OEL TWA (ppm)	1000 ppm
Saskatchewan	OEL STEL (ppm)	1250 ppm
Saskatchewan	OEL TWA (ppm)	1000 ppm

Ethane (74-84-0)		
USA ACGIH	ACGIH TWA (ppm)	1000 ppm
Alberta	OEL TWA (ppm)	1000 ppm
British Columbia	OEL TWA (ppm)	1000 ppm
Manitoba	OEL TWA (ppm)	1000 ppm
Newfoundland & Labrador	OEL TWA (ppm)	1000 ppm
Nova Scotia	OEL TWA (ppm)	1000 ppm
Ontario	OEL TWA (ppm)	1000 ppm
Prince Edward Island	OEL TWA (ppm)	1000 ppm
Saskatchewan	OEL STEL (ppm)	1250 ppm
Saskatchewan	OEL TWA (ppm)	1000 ppm

Exposure Controls

Appropriate Engineering Controls: Gas detectors should be used when flammable gases/vapours may be released.Ensure adequate ventilation, especially in confined areas.Proper grounding procedures to avoid static electricity should be followed.Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.Use explosion-proof equipment

Personal Protective Equipment: Protective goggles.Protective clothing.Respiratory protection of the dependent type.Insulated gloves

Materials for Protective Clothing: Chemically resistant materials and fabrics.Wear fire/flame resistant/retardant clothing

Hand Protection: Wear chemically resistant protective gloves.Insulated gloves

Eye Protection: Chemical goggles or face shield.

Skin and Body Protection: Not available

Respiratory Protection: Use a NIOSH-approved self-contained breathing apparatus whenever exposure may exceed established Occupational Exposure Limits.

Thermal Hazard Protection: Wear suitable protective clothing.

Other Information: When using, do not eat, drink or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on Basic Physical and Chemical Properties

Physical State : Gas

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Appearance	:	Clear, Colorless gas
Odor	:	Contains Ethyl Mercaptan for leak detection, which has a skunk-like odor, odorless.
Odor Threshold	:	Not available
pH	:	Not available
Relative Evaporation Rate (butylacetate=1)	:	Not available
Melting Point	:	Not available
Freezing Point	:	Not available
Boiling Point	:	-157 °C (-250.6°F)
Flash Point	:	-187 °C (-304.6°F)
Auto-ignition Temperature	:	> 288 °C (>550.4°F)
Decomposition Temperature	:	Not available
Flammability (solid, gas)	:	Extremely flammable gas
Lower Flammable Limit	:	3 %
Upper Flammable Limit	:	17 %
Vapor Pressure	:	40 mm Hg @25°C (77°F)
Relative Vapor Density at 20 °C	:	0.6
Relative Density	:	Not available
Specific Gravity	:	Not available
Solubility	:	Not available
Log Pow	:	Not available
Log Kow	:	Not available
Viscosity, Kinematic	:	Not available
Viscosity, Dynamic	:	Not available
Explosion Data – Sensitivity to Mechanical Impact	:	Not available
Explosion Data – Sensitivity to Static Discharge	:	Not available

SECTION 10: STABILITY AND REACTIVITY

Reactivity: Hazardous reactions will not occur under normal conditions.

Chemical Stability: Extremely flammable gas.Stable at standard temperature and pressure.

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Conditions to Avoid: Direct sunlight.Extremely high or low temperatures.Open flame.Overheating.Heat.Sparks.Incompatible materials. Avoid ignition sources

Incompatible Materials: Strong acids.Strong bases.Strong oxidizers.Halogenated compounds.Chlorine

Hazardous Decomposition Products: Carbon oxides (CO, CO2).hydrocarbons. Sulfur dioxide and hydrogen sulfide are fatal and irritating gases.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on Toxicological Effects - Product

Acute Toxicity : Not classified

LD50 and LC50 Data Not available

Skin Corrosion/Irritation: Not classified

Serious Eye Damage/Irritation: Not classified

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Teratogenicity: Not available

Carcinogenicity: Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

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Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: Gas can be toxic as a simple asphyxiant by displacing oxygen from the air. Asphyxia by lack of oxygen: risk of death. May cause drowsiness or dizziness.

Symptoms/Injuries After Skin Contact: Contact with the liquid may cause cold burns/frostbite.

Symptoms/Injuries After Eye Contact: This gas is non-irritating; but direct contact with liquefied/pressurized gas or frost particles may produce severe and possibly permanent eye damage from freeze burns.

Symptoms/Injuries After Ingestion: Ingestion is not considered a potential route of exposure. Non-irritating; but solid and liquid forms of this material and pressurized gas may cause freeze burns.

Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data

Hydrogen sulfide (7783-06-4)	
LC50 Inhalation Rat (mg/l)	0.99 mg/l (Exposure time: 1 h)
ATE (gases)	100.000 ppmV/4h

Propane (74-98-6)	
LC50 Inhalation Rat (mg/l)	658 mg/l (Exposure time: 4 h)

Butane (106-97-8)	
LC50 Inhalation Rat (mg/l)	658 mg/l (Exposure time: 4 h)

Ethane (74-84-0)	
LC50 Inhalation Rat (mg/l)	658 mg/l (Exposure time: 4 h)

SECTION 12: ECOLOGICAL INFORMATION

Toxicity

Wellhead Natural Gas (CAS Mixture)	
LC50 Fish 1	0.002 mg/l (Exposure time: 96 h - Species: Coregonus clupeaformis)

Hydrogen sulfide (7783-06-4)	
LC50 Fish 1	0.0448 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [flow-through])
EC50 Daphnia 1	0.022 mg/l (Exposure time: 96 h - Species: Gammarus pseudolimnaeus)
LC 50 Fish 2	0.016 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])

Persistence and Degradability

Wellhead Natural Gas	
Persistence and Degradability	Not established.

Bioaccumulative Potential

Wellhead Natural Gas	
Bioaccumulative Potential	Not established.

Hydrogen sulfide (7783-06-4)	
BCF fish 1	(no bioaccumulation expected)
Log Pow	0.45 (at 25 °C)

Propane (74-98-6)	
Log Pow	2.3

Butane (106-97-8)	
Log Pow	2.89

Carbon dioxide (124-38-9)	
BCF fish 1	(no bioaccumulation)
Log Pow	0.83

Ethane (74-84-0)	
Log Pow	<= 2.8

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Mobility in Soil Not available

Other Adverse Effects

Other adverse effects: Can cause frost damage to vegetation. Has photochemical ozone creation potential.

Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, provincial, territorial and international regulations.

Additional Information: Handle empty containers with care because residual vapors are flammable. Empty gas cylinders should be returned to the vendor for recycling or refilling.

SECTION 14: TRANSPORT INFORMATION

In Accordance With ICAO/IATA/DOT/TDG

UN Number

UN-No.(DOT): 1971

DOT NA no.: UN1971

UN Proper Shipping Name

DOT Proper Shipping Name : Natural gas, compressed (with high methane content)

Hazard Labels (DOT) : 2.1 - Flammable gases

DOT Packaging Exceptions (49 CFR 173.xxx) : 306

DOT Packaging Non Bulk (49 CFR 173.xxx) : 302

DOT Packaging Bulk (49 CFR 173.xxx) : 302

Additional Information

Emergency Response Guide (ERG) Number : 115

Transport by sea

DOT Vessel Stowage Location : E - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length, but is prohibited from carriage on passenger vessels in which the limiting number of passengers is exceeded.

DOT Vessel Stowage Other : 40 - Stow "clear of living quarters"

Air transport

DOT Quantity Limitations Passenger Aircraft/Rail (49 CFR 173.27) : Forbidden

DOT Quantity Limitations Cargo Aircraft Only (49 CFR 175.75) : 150 kg

SECTION 15: REGULATORY INFORMATION

US Federal Regulations

Wellhead Natural Gas	
SARA Section 311/312 Hazard Classes	Fire hazard Immediate (acute) health hazard Sudden release of pressure hazard

Hydrogen sulfide (7783-06-4)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Listed on SARA Section 302 (Specific toxic chemical listings)	
Listed on SARA Section 313 (Specific toxic chemical listings)	
SARA Section 302 Threshold Planning Quantity (TPQ)	500
SARA Section 313 - Emission Reporting	1.0 %

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Propane (74-98-6)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Butane (106-97-8)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Carbon dioxide (124-38-9)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Nitrogen (7727-37-9)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Methane (74-82-8)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Ethane (74-84-0)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

US State Regulations

Hydrogen sulfide (7783-06-4)
U.S. - California - SCAQMD - Toxic Air Contaminants - Non-Cancer Acute
U.S. - California - SCAQMD - Toxic Air Contaminants - Non-Cancer Chronic
U.S. - California - Toxic Air Contaminant List (AB 1807, AB 2728)
U.S. - Colorado - Hazardous Wastes - Discarded Chemical Products, Off-Specification Species, Container and Spill Residues
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)
U.S. - Delaware - Accidental Release Prevention Regulations - Sufficient Quantities
U.S. - Delaware - Accidental Release Prevention Regulations - Threshold Quantities
U.S. - Delaware - Accidental Release Prevention Regulations - Toxic Endpoints
U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities
U.S. - Hawaii - Occupational Exposure Limits - STELs
U.S. - Hawaii - Occupational Exposure Limits - TWAs
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Emission Levels (ELs)
U.S. - Idaho - Occupational Exposure Limits - Acceptable Maximum Peak Above the Ceiling Concentration for an 8-Hour Shift
U.S. - Idaho - Occupational Exposure Limits - Ceilings
U.S. - Idaho - Occupational Exposure Limits - TWAs
U.S. - Louisiana - Reportable Quantity List for Pollutants
U.S. - Maine - Air Pollutants - Hazardous Air Pollutants
U.S. - Massachusetts - Allowable Ambient Limits (AALs)
U.S. - Massachusetts - Allowable Threshold Concentrations (ATCs)
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Right To Know List
U.S. - Massachusetts - Threshold Effects Exposure Limits (TELs)
U.S. - Michigan - Occupational Exposure Limits - STELs
U.S. - Michigan - Occupational Exposure Limits - TWAs
U.S. - Michigan - Polluting Materials List
U.S. - Michigan - Process Safety Management Highly Hazardous Chemicals
U.S. - Minnesota - Chemicals of High Concern
U.S. - Minnesota - Hazardous Substance List
U.S. - Minnesota - Permissible Exposure Limits - STELs
U.S. - Minnesota - Permissible Exposure Limits - TWAs

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U.S. - Montana - Ambient Air Quality Standards
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances
U.S. - New Jersey - Environmental Hazardous Substances List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - New Jersey - TCPA - Extraordinarily Hazardous Substances (EHS)
U.S. - New Mexico - Air Quality - Ambient Air Quality Standards
U.S. - New York - Occupational Exposure Limits - TWAs
U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances
U.S. - North Carolina - Control of Toxic Air Pollutants
U.S. - North Dakota - Ambient Air Quality Standards - Maximum Permissible Concentrations
U.S. - North Dakota - Hazardous Wastes - Discarded Chemical Products, Off-Specification Species, Container and Spill Residues
U.S. - Ohio - Accidental Release Prevention - Threshold Quantities
U.S. - Ohio - Extremely Hazardous Substances - Threshold Quantities
U.S. - Oregon - Permissible Exposure Limits - Ceilings
U.S. - Oregon - Permissible Exposure Limits - STELs
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - 1-Hour
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - 24-Hour
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - Annual
U.S. - South Carolina - Toxic Air Pollutants - Maximum Allowable Concentrations
U.S. - South Carolina - Toxic Air Pollutants - Pollutant Categories
U.S. - Tennessee - Occupational Exposure Limits - STELs
U.S. - Tennessee - Occupational Exposure Limits - TWAs
U.S. - Texas - Drinking Water Standards - Secondary Constituent Levels (SCLs)
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term
U.S. - Vermont - Hazardous Waste - Hazardous Constituents
U.S. - Vermont - Permissible Exposure Limits - STELs
U.S. - Vermont - Permissible Exposure Limits - TWAs
U.S. - Virginia - Water Quality Standards - Chronic Freshwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Chronic Saltwater Aquatic Life
U.S. - Washington - Dangerous Waste - Dangerous Waste Constituents List
U.S. - Washington - Dangerous Waste - Discarded Chemical Products List
U.S. - Washington - Permissible Exposure Limits - STELs
U.S. - Washington - Permissible Exposure Limits - TWAs
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 25 Feet to Less Than 40 Feet
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 40 Feet to Less Than 75 Feet
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 75 Feet or Greater
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights Less Than 25 Feet
U.S. - Wyoming - Process Safety Management - Highly Hazardous Chemicals
U.S. - Alaska - Water Quality Standards - Chronic Aquatic Life Criteria for Fresh Water
U.S. - Alaska - Water Quality Standards - Chronic Aquatic Life Criteria for Marine Water

Propane (74-98-6)

U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)
U.S. - Delaware - Accidental Release Prevention Regulations - Sufficient Quantities
U.S. - Delaware - Accidental Release Prevention Regulations - Threshold Quantities
U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities

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U.S. - Hawaii - Occupational Exposure Limits - TWAs
U.S. - Idaho - Occupational Exposure Limits - TWAs
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Right To Know List
U.S. - Michigan - Occupational Exposure Limits - TWAs
U.S. - Minnesota - Hazardous Substance List
U.S. - Minnesota - Permissible Exposure Limits - TWAs
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances
U.S. - New Jersey - Environmental Hazardous Substances List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - New Jersey - TCPA - Extraordinarily Hazardous Substances (EHS)
U.S. - New York - Occupational Exposure Limits - TWAs
U.S. - Ohio - Accidental Release Prevention - Threshold Quantities
U.S. - Oregon - Permissible Exposure Limits - TWAs
U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Tennessee - Occupational Exposure Limits - TWAs
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term
U.S. - Vermont - Permissible Exposure Limits - TWAs
U.S. - Washington - Permissible Exposure Limits - STELs
U.S. - Washington - Permissible Exposure Limits - TWAs

Butane (106-97-8)

U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)
U.S. - Delaware - Accidental Release Prevention Regulations - Sufficient Quantities
U.S. - Delaware - Accidental Release Prevention Regulations - Threshold Quantities
U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities
U.S. - Hawaii - Occupational Exposure Limits - TWAs
U.S. - Maine - Chemicals of High Concern
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Right To Know List
U.S. - Michigan - Occupational Exposure Limits - TWAs
U.S. - Minnesota - Chemicals of High Concern
U.S. - Minnesota - Hazardous Substance List
U.S. - Minnesota - Permissible Exposure Limits - TWAs
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances
U.S. - New Jersey - Environmental Hazardous Substances List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - New Jersey - TCPA - Extraordinarily Hazardous Substances (EHS)
U.S. - Ohio - Accidental Release Prevention - Threshold Quantities
U.S. - Oregon - Permissible Exposure Limits - TWAs
U.S. - Pennsylvania - RTK (Right to Know) List

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U.S. - Tennessee - Occupational Exposure Limits - TWAs
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term
U.S. - Vermont - Permissible Exposure Limits - TWAs
U.S. - Washington - Permissible Exposure Limits - STELs
U.S. - Washington - Permissible Exposure Limits - TWAs

Carbon dioxide (124-38-9)

U.S. - Hawaii - Occupational Exposure Limits - STELs
U.S. - Hawaii - Occupational Exposure Limits - TWAs
U.S. - Idaho - Occupational Exposure Limits - TWAs
U.S. - Maine - Air Pollutants - Greenhouse Gases (GHG)
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Right To Know List
U.S. - Massachusetts - Volatile Organic Compounds Exempt From Requirements
U.S. - Michigan - Occupational Exposure Limits - STELs
U.S. - Michigan - Occupational Exposure Limits - TWAs
U.S. - Minnesota - Hazardous Substance List
U.S. - Minnesota - Permissible Exposure Limits - STELs
U.S. - Minnesota - Permissible Exposure Limits - TWAs
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New York - Occupational Exposure Limits - TWAs
U.S. - Oregon - Permissible Exposure Limits - TWAs
U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Tennessee - Occupational Exposure Limits - STELs
U.S. - Tennessee - Occupational Exposure Limits - TWAs
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term
U.S. - Vermont - Permissible Exposure Limits - STELs
U.S. - Vermont - Permissible Exposure Limits - TWAs
U.S. - Washington - Permissible Exposure Limits - STELs
U.S. - Washington - Permissible Exposure Limits - TWAs

Nitrogen (7727-37-9)

U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Right To Know List
U.S. - Minnesota - Hazardous Substance List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Washington - Permissible Exposure Limits - Simple Asphyxiants

Methane (74-82-8)

U.S. - Delaware - Accidental Release Prevention Regulations - Sufficient Quantities
U.S. - Delaware - Accidental Release Prevention Regulations - Threshold Quantities
U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities
U.S. - Delaware - Volatile Organic Compounds Exempt from Requirements
U.S. - Maine - Air Pollutants - Greenhouse Gases (GHG)
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Right To Know List
U.S. - Massachusetts - Volatile Organic Compounds Exempt From Requirements

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U.S. - Minnesota - Hazardous Substance List
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances
U.S. - New Jersey - Environmental Hazardous Substances List
U.S. - New Jersey - Excluded Volatile Organic Compounds
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - New Jersey - TCPA - Extraordinarily Hazardous Substances (EHS)
U.S. - Ohio - Accidental Release Prevention - Threshold Quantities
U.S. - Oregon - Permissible Exposure Limits - TWAs
U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term
U.S. - Washington - Permissible Exposure Limits - Simple Asphyxiants

Ethane (74-84-0)

U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)
U.S. - Delaware - Accidental Release Prevention Regulations - Sufficient Quantities
U.S. - Delaware - Accidental Release Prevention Regulations - Threshold Quantities
U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities
U.S. - Delaware - Volatile Organic Compounds Exempt from Requirements
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Right To Know List
U.S. - Massachusetts - Volatile Organic Compounds Exempt From Requirements
U.S. - Minnesota - Hazardous Substance List
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances
U.S. - New Jersey - Environmental Hazardous Substances List
U.S. - New Jersey - Excluded Volatile Organic Compounds
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - New Jersey - TCPA - Extraordinarily Hazardous Substances (EHS)
U.S. - Ohio - Accidental Release Prevention - Threshold Quantities
U.S. - Oregon - Permissible Exposure Limits - TWAs
U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term
U.S. - Washington - Permissible Exposure Limits - Simple Asphyxiants

Canadian Regulations

Wellhead Natural Gas	
WHMIS Classification	Class B Division 1 - Flammable Gas Class A - Compressed Gas

Hydrogen sulfide (7783-06-4)

Listed on the Canadian DSL (Domestic Substances List) inventory.
Listed on the Canadian Ingredient Disclosure List

Wellhead Natural Gas

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

WHMIS Classification	Class A - Compressed Gas Class B Division 1 - Flammable Gas Class D Division 1 Subdivision A - Very toxic material causing immediate and serious toxic effects Class D Division 2 Subdivision B - Toxic material causing other toxic effects

Propane (74-98-6)	
Listed on the Canadian DSL (Domestic Substances List) inventory.	
WHMIS Classification	Class A - Compressed Gas Class B Division 1 - Flammable Gas

Butane (106-97-8)	
Listed on the Canadian DSL (Domestic Substances List) inventory. Listed on the Canadian Ingredient Disclosure List	
WHMIS Classification	Class A - Compressed Gas Class B Division 1 - Flammable Gas

Carbon dioxide (124-38-9)	
Listed on the Canadian DSL (Domestic Substances List) inventory. Listed on the Canadian Ingredient Disclosure List	
WHMIS Classification	Class A - Compressed Gas

Nitrogen (7727-37-9)	
Listed on the Canadian DSL (Domestic Substances List) inventory.	
WHMIS Classification	Class A - Compressed Gas

Methane (74-82-8)	
Listed on the Canadian DSL (Domestic Substances List) inventory.	
WHMIS Classification	Class A - Compressed Gas Class B Division 1 - Flammable Gas

Ethane (74-84-0)	
Listed on the Canadian DSL (Domestic Substances List) inventory.	
WHMIS Classification	Class A - Compressed Gas Class B Division 1 - Flammable Gas

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations **(CPR)** and the MSDS contains all of the information required by CPR.

SECTION 16: OTHER INFORMATION

Revision date : 10/02/2013

Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200

GHS Full Text Phrases:

Acute Tox. 2 (Inhalation:gas)	Acute toxicity (inhalation:gas) Category 2
Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Compressed gas	Gases under pressure Compressed gas
Flam. Gas 1	Flammable gases Category 1
Liquefied gas	Gases under pressure Liquefied gas
Simple Asphy	Simple Asphyxiant
H220	Extremely flammable gas
H280	Contains gas under pressure; may explode if heated
H330	Fatal if inhaled
H400	Very toxic to aquatic life

Party Responsible for the Preparation of This Document

Wellhead Natural Gas

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Williams, Inc.
One Williams Center
Tulsa, OK 74172, US
800-688-7507

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product

North America GHS US 2012 & WHMIS

ATTACHMENT I

Emission Units Table

"25. Fill out the **Emission Units Table** and provide it as Attachment I."

- **Emissions Unit Table**

Williams Ohio Valley Midstream LLC

FRANCIS COMPRESSOR STATION

Application for 45CSR13 NSR Construction Permit

Attachment I

EMISSION UNITS TABLE

(Include all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status.)

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified[3]	Design Capacity	Type and Date of Change[3]	Control Device[4]
CE-01	22E	CAT G3516B Compressor Engine (OxCat)	TBD	1,380 bhp	New	1-OxCat
RPC-3	23E	Rod Packing/Crankcase Leaks	TBD	2 Recip	New	---
SSM-2	24E	Start/Stop/Maintenance (i.e., Blowdown)	TBD	2 Recip	New	---
FUG-3	25E	Piping and Equipment Fugitives - Gas	TBD	---	New	LDAR

[1] For Emission Units (or Sources) use the following numbering system: 1S, 2S, 3S, ... or other appropriate designation.
[2] For Emission Points use the following numbering system: 1E, 2E, 3E, ... or other appropriate designation.
[3] New, modification, removal, etc.
[4] For Control Devices use the following numbering system: 1C, 2C, 3C, ... or other appropriate designation.

ATTACHMENT J

Emission Points Data Summary Sheet

"26. Fill out the **Emission Points Data Summary Sheet** (Table 1 and Table 2) and provide it as Attachment J."

- **Table 1 – Emissions Data**
  - Compressor Engine Emissions – 1,380 bhp CAT G3516B (CE-01/22E)
  - Compressor Rod Packing and Engine Crankcase Leaks (RPC-3/23E)
  - Startup/Shutdown/Maintenance (Including Blowdown) (SSM-2/24E)
  - Piping and Equipment Fugitives (FUG-3/25E)
  - FRANCIS COMPRESSOR STATION (FCS) – FACILITY-WIDE SUMMARY
  - OAK GROVE GAS PLANT (OGGP) – FACILITY-WIDE SUMMARY
- **Table 2 – Release Parameter Data**

Attachment J - Emission Points Data Summary Sheet

Compressor Engine Emissions – 1,380 bhp CAT G3516B (CE-01/22E)

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
		1,380 bhp CAT G3516B (4SLB@1,400 rpm) Compressor Engine 01/22E						NOx	1.52	6.66	1.52	6.66	Gas	Vendor	
								CO	8.88	38.91	0.89	3.89	Gas	Vendor	
								VOC	4.29	18.79	1.29	5.64	Gas	Vendor	
								SO2	0.01	0.03	0.01	0.03	Gas	AP-42	
								PM10/2.5	0.11	0.49	0.11	0.49	Liq/Solid	AP-42	
								Acetaldehyde	0.09	0.41	0.03	0.12	Gas	AP-42	
								Acrolein	0.06	0.25	0.02	0.08	Gas	AP-42	
								Benzene	0.01	0.02	1.5E-03	0.01	Gas	AP-42	
								Ethylbenzene	4.5E-04	2.0E-03	1.3E-04	5.9E-04	Gas	AP-42	
								Formaldehyde	1.22	5.33	0.37	1.60	Gas	Vendor	
								n-Hexane	0.01	0.05	0.00	0.02	Gas	AP-42	
CE-01/ 22E	Upward Vertical	CE-01/ 22E	CE-01/ 22E	01-OxCat	OxCat	C	8,760	Methanol	0.03	0.12	0.01	0.04	Gas	AP-42	
								Toluene	4.6E-03	0.02	1.4E-03	0.01	Gas	AP-42	
								2,2,4-TMP	2.8E-03	0.01	8.5E-04	3.7E-03	Gas	AP-42	
								Xylenes	2.1E-03	0.01	6.2E-04	2.7E-03	Gas	AP-42	
								Other HAP	0.01	0.05	3.2E-03	0.01	Gas	AP-42	
								Total HAP	1.44	6.29	0.43	1.89	Gas	Sum	
								CO2	1,530	6,703	1,530	6,703	Gas	Vendor	
								CH4	7	32	7	32	Gas	Vendor	
								N2O	2.5E-03	0.01	2.5E-03	0.01	Gas	AP-42	
								CO2e	1,713	7,502	1,713	7,502	Gas	Wgt Sum	

Continued ...

Attachment J - Emission Points Data Summary Sheet

Compressor Rod Packing and Engine Crankcase Leaks (RPC-3/23E)

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
		Compressor Rod Packing and Engine Crankcase Leaks (RPC-3/23E)						NOx	—	—	—	—	Gas	Vendor	
								CO	—	—	—	—	Gas	Vendor	
								VOC	1.32	5.76	1.32	5.76	Gas	Vendor	
								SO2	—	—	—	—	Gas	AP-42	
								PM10/2.5	—	—	—	—	Liq/Solid	AP-42	
								Acetaldehyde	—	—	—	—	Gas	AP-42	
								Acrolein	—	—	—	—	Gas	AP-42	
								Benzene	1.8E-03	0.01	1.8E-03	0.01	Gas	AP-42	
								Ethylbenzene	1.8E-03	0.01	1.8E-03	0.01	Gas	AP-42	
								Formaldehyde	0.01	0.05	0.01	0.05	Gas	Vendor	
								n-Hexane	0.02	0.07	0.02	0.07	Gas	AP-42	
								Methanol	—	—	—	—	Gas	AP-42	
RPC/ 23E	Varies	RPC/ 23E	RPC/ 23E	—	—	C	8,760	Toluene	1.8E-03	0.01	1.8E-03	0.01	Gas	AP-42	
								2,2,4-TMP	1.8E-03	0.01	1.8E-03	0.01	Gas	AP-42	
								Xylenes	1.8E-03	0.01	1.8E-03	0.01	Gas	AP-42	
								Other HAP	—	—	—	—	Gas	AP-42	
								Total HAP	0.04	0.15	0.04	0.15	Gas	Sum	
								CO2	13	58	13	58	Gas	Vendor	
								CH4	3	12	3	12	Gas	Vendor	
								N2O	—	—	—	—	Gas	AP-42	
								CO2e	79	347	79	347	Gas	Wgt Sum	

Continued ...

Attachment J - Emission Points Data Summary Sheet

Start/Stop/Maintenance (Including Blowdown) (SSM-2/24E)

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
		Startup/Shutdown/Maintenance (Including Blowdown) (SSM-2/24E)						NOx	---	---	---	---	Gas	Vendor	
								CO	---	---	---	---	Gas	Vendor	
								VOC	---	16.02	---	16.02	Gas	Vendor	
								SO2	---	---	---		Gas	AP-42	
								PM10/2.5	---	---	---		Liq/Solid	AP-42	
								Acetaldehyde	---	---	---	---	Gas	AP-42	
								Acrolein	---	---	---	---	Gas	AP-42	
								Benzene	---	0.02	---	0.02	Gas	AP-42	
								Ethylbenzene	---	0.02	---	0.02	Gas	AP-42	
								Formaldehyde	---	---	---	---	Gas	Vendor	
								n-Hexane	---	0.19	---	0.19	Gas	AP-42	
								Methanol	---	---	---	---	Gas	AP-42	
SSM-2/ 24E	Varies	SSM-2/ 24E	SSM-2/ 24E	---	---	Varies	na	Toluene	---	0.02	---	0.02	Gas	AP-42	
								2,2,4-TMP	---	0.02	---	0.02	Gas	AP-42	
								Xylenes	---	0.02	---	0.02	Gas	AP-42	
								Other HAP	---	---	---	---	Gas	AP-42	
								Total HAP	---	0.29	---	0.29	Gas	Sum	
								CO2	---	---	---	---	Gas	Vendor	
								CH4	---	35	---	35	Gas	Vendor	
								N2O	---	---	---	---	Gas	AP-42	
								CO2e	---	881	---	881	Gas	Wgt Sum	

Continued ...

Piping and Equipment Fugitives (FUG-3/25E)

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
		Piping and Equipment Fugitives (FUG-3/25E)						NOx	---	---	---	---	Gas	Vendor	
								CO	---	---	---	---	Gas	Vendor	
								VOC	1.32	5.77	0.63	2.77	Gas	Vendor	
								SO2	---	---	---	---	Gas	AP-42	
								PM10/2.5	---	---	---	---	Liq/Solid	AP-42	
								Acetaldehyde	---	---	---	---	Gas	AP-42	
								Acrolein	---	---	---	---	Gas	AP-42	
								Benzene	4.2E-03	0.02	3.1E-03	0.01	Gas	AP-42	
								Ethylbenzene	4.2E-03	0.02	3.1E-03	0.01	Gas	AP-42	
								Formaldehyde	---	---	---	---	Gas	Vendor	
								n-Hexane	0.03	0.12	1.8E-02	0.08	Gas	AP-42	
								Methanol	---	---	---	---	Gas	AP-42	
FUG-3/ 25E	Fugitive	FUG-3/ 25E	FUG-3/ 25E	LDAR	LDAR	C	8,760	Toluene	4.2E-03	0.02	3.1E-03	0.01	Gas	AP-42	
								2,2,4-TMP	4.2E-03	0.02	3.1E-03	0.01	Gas	AP-42	
								Xylenes	4.2E-03	0.02	3.1E-03	0.01	Gas	AP-42	
								Other HAP	---	---	---	---	Gas	AP-42	
								Total HAP	0.05	0.21	0.03	0.15	Gas	Sum	
								CO2	0.02	0.08	0.01	0.03	Gas	Vendor	
								CH4	1	2	0.2	1	Gas	Vendor	
								N2O	---	---	---	---	Gas	AP-42	
								CO2e	13	57	6	21	Gas	Wgt Sum	

Continued ...

FACILITY-WIDE SUMMARY

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
								NOx	1.52	6.66	1.52	6.66	Gas	Sum	
								CO	8.88	38.91	0.89	3.89	Gas	Sum	
								VOC - Point	5.61	40.57	2.60	27.42	Gas	Sum	
								VOC - Fug	1.32	5.77	0.63	2.77	Gas	Sum	
								VOC - Total	6.92	46.34	3.24	30.19	Gas	Sum	
								SO2	0.01	0.03	0.01	0.03	Gas	Sum	
								PM10/2.5	0.11	0.49	0.11	0.49	Solid/Gas	Sum	
								Acetaldehyde	0.09	0.41	0.03	0.12	Gas	Sum	
								Acrolein	0.06	0.25	0.02	0.08	Gas	Sum	
								Benzene	0.01	0.07	6.4E-03	0.05	Gas	Sum	
								Ethylbenzene	6.4E-03	0.05	5.0E-03	0.04	Gas	Sum	
								Formaldehyde	1.23	5.38	0.38	1.65	Gas	Sum	
								n-Hexane	0.06	0.44	0.04	0.36	Gas	Sum	
								Methanol	0.03	0.12	0.01	0.04	Gas	---	
na	na	na	na	na	na	na	na	Toluene	0.01	0.07	6.3E-03	0.05	Gas	Sum	
								2,2,4-TMP	0.01	0.06	5.7E-03	0.04	Gas	Sum	
								Xylenes	0.01	0.05	5.5E-03	0.04	Gas	Sum	
								Other HAP	0.01	0.05	3.2E-03	0.01	Gas	Sum	
								Total HAP	1.52	6.94	0.50	2.48	Gas	Sum	
								CO2	1,544	6,761	1,544	6,761	Gas	Sum	
								CH4	10	81	10	80	Gas	Sum	
								N2O	2.5E-03	0.01	2.5E-03	0.01	Gas	Sum	
								CO2e	1,805	8,788	1,798	8,751	Gas	Wgt Sum	

FRANCIS COMPRESSOR STATION (FCS)
FACILITY-WIDE SUMMARY
(Including Fugitives (FUG-3/25E))

Attachment J - Emission Points Data Summary Sheet

OAK GROVE GAS PLANT - FACILITY-WIDE SUMMARY

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(Chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] *(ppmv or mg/m^3)*
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
								NOx	651.48	132.01	651.48	127.93	Gas	Sum	
								CO	1,295	235.64	1,287	196.47	Gas	Sum	
								VOC - Point	17,769	2,128	215.05	98.36	Gas	Sum	
								VOC - Fug	29.91	131.00	14.07	45.34	Gas	Sum	
								VOC - Total	17,799	2,259	229.12	143.69	Gas	Sum	
								SO2	1.68	0.80	1.68	0.79	Gas	Sum	
								PM10/2.5	21.55	11.35	21.55	11.18	Solid/Gas	Sum	
								Acetaldehyde	0.03	0.12	0.03	0.12	Gas	Sum	
								Acrolein	0.02	0.08	0.02	0.08	Gas	Sum	
								Benzene	449.99	53.02	5.59	1.97	Gas	Sum	
								Ethylbenzene	610.24	71.40	7.19	2.14	Gas	Sum	
								Formaldehyde	0.44	1.91	0.79	1.77	Gas	Sum	
								n-Hexane	549.76	66.48	7.00	4.12	Gas	Sum	
								Methanol	0.01	0.04	0.01	0.04	Gas	---	
na	na	na	na	na	na	na	na	Toluene	531.15	62.33	6.40	2.06	Gas	Sum	
								2,2,4-TMP	656.51	76.71	7.65	2.20	Gas	Sum	
								Xylenes	612.23	71.63	7.21	2.15	Gas	Sum	
								Other HAP	0.01	0.02	0.03	0.02	Gas	Sum	
								Total HAP	3,410.41	403.83	41.90	16.67	Gas	Sum	
								CO2	32,714	143,286	51,395	225,108	Gas	Sum	
								CH4	812	3,555	180	788	Gas	Sum	
								N2O	0.05	0.23	15.66	68.60	Gas	Sum	
								CO2e	53,019	232,224	60,557	265,241	Gas	Wgt Sum	

OAK GROVE GAS PLANT (OGGP)
FACILITY-WIDE SUMMARY
(Including Francis CS and Independence CS)
(Including Fugitives)

Attachment J - Emission Points Data Summary Sheet

Notes

Criteria Pollutants	
Pollutant	**CAS**
NO2	10024-97-2
CO	630-08-0
VOC	varies
Propane	74-98-6
i-Butane	75-28-5
n-Butane	106-97-8
SO2	7446-09-5
PM10/2.5	varies

Hazardous Air Pollutants (HAPs)	
Pollutant	**CAS**
Acetaldehyde	75-07-0
Acrolein	107-02-8
Benzene	71-43-2
Ethylbenzene	100-41-4
Formaldehyde	50-00-0
n-Hexane	110-54-3
Methanol	67-56-1
Toluene	108-88-3
2,2,4-TMP	540-84-1
Xylenes	1330-20-7

Greenhouse Gas (GHG) Pollutants	
Pollutant	**CAS**
CO2	124-38-9
CH4	74-82-8
N2O	10024-97-2
CO2e	na

Table 1: Notes

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

1 Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.
2 Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).
3 List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS2, VOCs, H2S, Inorganics, Lead, Organics, O3, NO, NO2, SO2, SO3, all applicable Greenhouse Gases (including CO2 and methane), etc. DO NOT LIST H2, H2O, N2, O2, and Noble Gases.
4 Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).
5 Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).
6 Indicate method used to determine emission rate as follows:
MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).
7 Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO2, use units of ppmv (See 45CSR10).

Williams Ohio Valley Midstream LLC

FRANCIS COMPRESSOR STATION

Application for 45CSR13 NSR Construction Permit

Attachment J - Emission Points Data Summary Sheet

Release Parameter Data

Table 2: Release Parameter Data

Emission Point ID No. *(Must match Emission Units Table)*		Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
			Temp. (oF)	Volumetric Flow[1] (acfm) *(At operating conditions)*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height[2] *(Release height of emissions above ground level)*	Northing	Easting
CE-01	22E	1.0	1,007	9,216	---	1,200	20	4,413.81	526.24
RPC-3	23E	NA	100	---	---	1,200	4	4,413.81	526.24
SSM-2	24E	NA	100	---	---	1,200	4	4,413.81	526.24
FUG-3	25E	NA	100	---	---	1,200	4	4,413.81	526.24

[1] Give at operating conditions. Include inerts.
2 Release height of emissions above ground level.

ATTACHMENT K

Fugitive Emissions Data Summary Sheet

"27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as Attachment K."

- **Application Forms Checklist**
- **Fugitive Emissions Summary**
- **Leak Source Data Sheet**

Williams Ohio Valley Midstream LLC

FRANCIS COMPRESSOR STATION

Application for 45CSR13 NSR Construction Permit

Attachment K - Fugitive Emissions

Fugitive Emissions Data Summary Sheet

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS
1.) Will there be haul road activities? ☐ Yes ☑ No ☐ If Yes, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.) Will there be Storage Piles? ☐ Yes ☑ No ☐ If Yes, then complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.) Will there be Liquid Loading/Unloading Operations? ☐ Yes ☑ No ☐ If Yes, then complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation? ☐ Yes ☑ No ☐ If Yes, then complete the GENERAL EMISSIONS UNIT DATA SHEET.
5.) Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)? **☑ Yes** ☐ No **☑ If Yes, then complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.**
6.) Will there be General Clean-up VOC Operations? ☐ Yes ☑ No ☐ If Yes, then complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.) Will there be any other activities that generate fugitive emissions? ☐ Yes ☑ No ☐ If Yes, then complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.
If you answered "NO" to all of the items above, it is not necessary to complete the following table, "Fugitive Emissions Summary."

Fugitive Emissions Data Summary Sheet - Continued

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.
Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions.

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants Chemical Name/CAS[1]	Maximum Potential Pre-Controlled Emissions[2]		Maximum Potential Controlled Emissions[3]		Est. Method Used[4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Paved Haul Roads	na	---	---	---	---	---
Unpaved Haul Roads	na	---	---	---	---	---
Storage Pile Emissions	na.	---	---	---	---	---
Loading/Unloading Operations	na	---	---	---	---	---
Wastewater Treatment	na	---	---	---	---	---
Equipment Leaks (FUG-3/25E)	**VOC**	**1.32**	**5.77**	**0.63**	**2.77**	**AP-42**
	Acetaldehyde	---	---	---	---	**AP-42/MB**
	Acrolein	---	---	---	---	**AP-42/MB**
	Benzene	**4.2E-03**	**0.02**	**3.1E-03**	**0.01**	**AP-42/MB**
	Ethylbenzene	**4.2E-03**	**0.02**	**3.1E-03**	**0.01**	**AP-42/MB**
	Formaldehyde	---	---	---	---	**AP-42/MB**
	n-Hexane	**0.03**	**0.12**	**0.02**	**0.08**	**AP-42/MB**
	Methanol	---	---	---	---	**AP-42/MB**
	Toluene	**4.2E-03**	**0.02**	**3.1E-03**	**0.01**	**AP-42/MB**
	2,2,4-TMP	**4.2E-03**	**0.02**	**3.1E-03**	**0.01**	**AP-42/MB**
	Xylenes	**4.2E-03**	**0.02**	**3.1E-03**	**0.01**	**AP-42/MB**
	Other HAP	---	---	---	---	**AP-42/MB**
	Total HAP	**0.05**	**0.21**	**0.03**	**0.15**	**SUM**
	CO2	**0.02**	**0.1**	**0.01**	**0.03**	**AP-42**
	CH4	**2.3**	**9.9**	**0.8**	**3.6**	**AP-42**
	N2O	---	---	---	---	---
	CO2e	**57**	**248**	**21**	**90**	**Wgt Sum**
General Clean-up - VOC Emissions	na	---	---	---	---	---
Other	na	---	---	---	---	---

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases, etc. DO NOT LIST H_2, H_2O, N_2, O_2, and Noble Gases.

[2] Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in min (e.g. 5 lb VOC/20 min batch).

[3] Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in min (e.g. 5 lb VOC/20 min batch).

[4] Indicate method used to determine emission rate as follows:
MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

Fugitive Emissions Data Summary Sheet - Continued

LEAK SOURCE DATA SHEET					
Soure Category	Pollutant	Number of Source Components[1]	Number of Components Monitored by Frequency[2]	Average Time to Repair (Days)[3]	Estimated Annual Emission Rate (lb/yr)[4]
Pumps[5]	Light Liquid VOC[6,7]	6	6/0/0/0/0/0 na	≤ 5	1
	Heavy Liquid VOC[8]	---	---	---	---
	Non-VOC[9] (Water/Oil)	---	---	---	---
Valves[10]	Gas VOC	257	257/0/0/0/0/0 na	≤ 5	822
	Light Liquid VOC	64	64/0/0/0/0/0 na	≤ 5	19
	Heavy Liquid VOC	---	---	---	---
	Non-VOC[9] (Water/Oil)	---	---	---	---
Safety Relief Valves[11]	Gas VOC	See "Other"	---	---	---
	Light Liquid VOC	---	---	---	---
	Non-VOC[9] (Water/Oil)	---	---	---	---
Open Ended Lines[12]	Gas VOC	14	0	---	153
	Light Liquid VOC	4	0	---	17
	Non-VOC[9] (Water/Oil)	---	---	---	---
Sampling Connections[13]	Gas VOC	See "Open Ended Lines"	---	---	---
	Light Liquid VOC	---	---	---	---
	Non-VOC[9] (Water/Oil)	---	---	---	---
Compressors	Gas VOC	See "Other"	---	---	---
	Non-VOC[9] (Water/Oil)	---	---	---	---
Flanges	Gas VOC	120	120/0/0/0/0/0 na	≤ 5	256
	Light Liquid VOC	30	30/0/0/0/0/0 na	≤ 5	2
	Non-VOC[9] (Water/Oil)	---	---	---	---
Other (Connectors)	Gas VOC	767	0/0/0/0/767/0 na	≤ 5	1,982
	Light Liquid VOC	192	0/0/0/0/192/0 na	≤ 5	2,290
	Non-VOC[9] (Water/Oil)	---	---	---	---
				TOTAL (lb/yr)	**5,542**
				TOTAL (tpy)	**2.77**

Attachment K
FUGITIVE EMISSIONS DATA SUMMARY SHEET - Continued

Notes for Leak Source Data Sheet

1. For VOC sources include components on streams and equipment that contain greater than 10% VOC, including feed streams, reaction/separation facilities, and product/by-product delivery lines. Do not include certain leakless equipment as defined below by category.

2. By monitoring frequency, give the number of sources routinely monitored for leaks, using a portable detection device that measures concentration in visual or soap-bubble leak detection ppm. Do not include monitoring by methods. "M/Q(M)/Q/SA/A/0" means the time period between inspections as follows:
Monthly/Quarterly, with Monthly follow-up of repaired leakers/Quarterly/Semi-annual/Annually/other (specify time period)

If source category is not monitored, a single zero in the space will suffice. For example, if 50 gas-service valves are monitored quarterly, with monthly follow-up of those repaired, 75 are monitored semi-annually, and 50 are checked bimonthly (alternate months), with non checked at any other frequency, you would put in the category valves, gas service: 0/50/0/75/0/50 (bimonthly).

3. Give the average number of days, after a leak is discovered, that an attempt will be made to repair the leak.

4. Note the method used: MB - material balance; EE - engineering estimate; EPA - emission factors established by EPA (cite document used); 0 - other method, such as in-house emission factor (specify).

5. Do not include in the equipment count seal-less pumps (canned motor or diaphragm) or those with enclosed venting to a control device. (Emissions from vented equipment should be included in the estimates given in the Emission Points Data Sheet.)

6. Volatile organic compounds (VOC) means the term as defined in 40 CFR. 51.100 (s).

7. A light liquid is defined as a fluid with vapor pressure equal to or greater than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if 20% w/w or more of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20°C, then the fluid is defined as a light liquid.

8. A heavy liquid is defined as a fluid with a vapor pressure less than 0.04 psi (0.3 Kpa) at 20°c. For mixtures, if less than 20% w/w of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20°C. then the fluid is defined as a heavy liquid.

9. LIST CO, H2S, mineral acids, NO, NO, SO, etc. DO NOT LIST CO, H, H20, N, O, and Noble Gases.

10. Include all process valves whether in-line or on an open-ended line such as sample, drain and purge valves. Do not include safety-relief valves, or leakless valves such as check, diaphragm, and bellows seal valves.

11. Do not include a safety-relief valve if there is a rupture disk in place upstream of the valve, or ifthe valve vents to a control device.

12. Open-ended lines include purge, drain and vent lines. Do not include sampling connections, or lines sealed by plugs, caps, blinds or second valves.

13. Do not include closed-purge sampling connections.

ATTACHMENT L

Emissions Unit Data Sheet(s)

"28. Fill out the **Emissions Unit Data Sheet(s)** as Attachment L."

- **NATURAL GAS COMPRESSOR/GENERATOR ENGINE (CE-01/22E)**
  - 1,380 BHP CAT G3516B ENGINE - VENDOR DATA

- **ELECTRIC MOTOR DRIVEN COMPRESSOR (RPC-3/23E)**
  - LEROI LRG9-DP - VENDOR DATA

Williams Ohio Valley Midstream LLC

FRANCIS COMPRESSOR STATION

Application for 45CSR13 NSR Construction Permit

Attachment L - Emission Unit Data Sheet

NATURAL GAS COMPRESSOR/GENERATOR ENGINE DATA SHEET

Facility		**Francis**					
Source Identification Number[1]		**CE-01/22E**					
Engine Manufacturer and Model		**CAT G3516B**					
Manufacturer's Rated bhp/rpm		**1,380 / 1,400**					
Source Status[2]		**NS**					
Date Installed/Modified/Removed[3]		**TBD**					
Manufactured/Reconstruction Date[4]		**After 06/12/06**					
Certified Engine (40CFR60 NSPS JJJJ)[5]		**No**					
Engine, Fuel and Combustion Data	Engine Type[6]	**LB4S**					
	APCD Type[7]	**OXCAT**					
	Fuel Type[8]	**RG**					
	H_2S (gr/100 scf)	**0.2**					
	Operating bhp/rpm	**1,380 / 1,400**					
	BSFC (Btu/bhp-hr)	**8,182**					
	Fuel (ft^3/hr)	**11,070**					
	Fuel ($MMft^3$/yr)	**96.97**					
	Operation (hrs/yr)	**8,760**					
Reference[9]	PTE[10]	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
MD	NOx	**1.52**	**6.66**				
MD	CO	**0.89**	**3.89**				
MD	VOC	**1.29**	**5.64**				
AP	SO2	**0.01**	**0.03**				
AP	PM10/2.5	**0.11**	**0.49**				
MD	HCHO	**0.37**	**1.60**				
MD/AP	Total HAP	**0.43**	**1.89**				
MD/40CFR98	CO2e	**1,713**	**7,502**				

G3516B

GAS COMPRESSION APPLICATION

GAS ENGINE SITE SPECIFIC TECHNICAL DATA
Francis 1

CATERPILLAR®

ENGINE SPEED (rpm):	1400	RATING STRATEGY:	STANDARD
COMPRESSION RATIO:	8	RATING LEVEL:	CONTINUOUS
AFTERCOOLER TYPE:	SCAC	FUEL SYSTEM:	CAT WIDE RANGE WITH AIR FUEL RATIO CONTROL
AFTERCOOLER - STAGE 2 INLET (°F):	130		
AFTERCOOLER - STAGE 1 INLET (°F):	201	**SITE CONDITIONS:**	
JACKET WATER OUTLET (°F):	210	FUEL:	Gas Analysis
ASPIRATION:	TA	FUEL PRESSURE RANGE(psig):	7.0-40.0
COOLING SYSTEM:	JW+OC+1AC, 2AC	FUEL METHANE NUMBER:	57.3
CONTROL SYSTEM:	ADEM3	FUEL LHV (Btu/scf):	1181
EXHAUST MANIFOLD:	DRY	ALTITUDE(ft):	1500
COMBUSTION:	LOW EMISSION	MAXIMUM INLET AIR TEMPERATURE(°F):	100
NOx EMISSION LEVEL (g/bhp-hr NOx):	0.5	STANDARD RATED POWER:	1380 bhp@1400rpm
SET POINT TIMING:	28		

RATING		NOTES	LOAD	MAXIMUM RATING	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE		
ENGINE POWER	(WITHOUT FAN)	(1)	bhp	1380	1380	1035	690
INLET AIR TEMPERATURE			°F	100	100	100	100
ENGINE DATA							
FUEL CONSUMPTION (LHV)		(2)	Btu/bhp-hr	7425	7425	7953	8542
FUEL CONSUMPTION (HHV)		(2)	Btu/bhp-hr	8182	8182	8763	9412
AIR FLOW (@inlet air temp, 14.7 psia)	(WET)	(3)(4)	ft3/min	3284	3284	2576	1801
AIR FLOW	(WET)	(3)(4)	lb/hr	13962	13962	10953	7657
FUEL FLOW (60°F, 14.7 psia)			scfm	145	145	116	83
INLET MANIFOLD PRESSURE		(5)	in Hg(abs)	93.3	93.3	75.7	53.2
EXHAUST TEMPERATURE - ENGINE OUTLET		(6)	°F	1007	1007	1000	1020
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(WET)	(7)(4)	ft3/min	9216	9216	7207	5113
EXHAUST GAS MASS FLOW	(WET)	(7)(4)	lb/hr	14454	14454	11348	7940
EMISSIONS DATA - ENGINE OUT							
NOx (as NO2)		(8)(9)	g/bhp-hr	0.50	0.50	0.50	0.50
CO		(8)(9)	g/bhp-hr	2.92	2.92	3.13	3.08
THC (mol. wt. of 15.84)		(8)(9)	g/bhp-hr	4.53	4.53	4.86	4.93
NMHC (mol. wt. of 15.84)		(8)(9)	g/bhp-hr	2.14	2.14	2.29	2.32
NMNEHC (VOCs) (mol. wt. of 15.84)		(8)(9)(10)	g/bhp-hr	1.01	1.01	1.08	1.10
HCHO (Formaldehyde)		(8)(9)	g/bhp-hr	0.40	0.40	0.39	0.39
CO2		(8)(9)	g/bhp-hr	503	503	537	584
EXHAUST OXYGEN		(8)(11)	% DRY	9.1	9.1	8.8	8.4
HEAT REJECTION							
HEAT REJ. TO JACKET WATER (JW)		(12)	Btu/min	22309	22309	20744	19351
HEAT REJ. TO ATMOSPHERE		(12)	Btu/min	6110	6110	5092	4074
HEAT REJ. TO LUBE OIL (OC)		(12)	Btu/min	4475	4475	3978	3363
HEAT REJ. TO A/C - STAGE 1 (1AC)		(12)(13)	Btu/min	12348	12348	10260	3630
HEAT REJ. TO A/C - STAGE 2 (2AC)		(12)(13)	Btu/min	5637	5637	5297	3438

COOLING SYSTEM SIZING CRITERIA			
TOTAL JACKET WATER CIRCUIT (JW+OC+1AC)	(13)(14)	Btu/min	42875
TOTAL AFTERCOOLER CIRCUIT (2AC)	(13)(14)	Btu/min	5919
A cooling system safety factor of 0% has been added to the cooling system sizing criteria.			

CONDITIONS AND DEFINITIONS

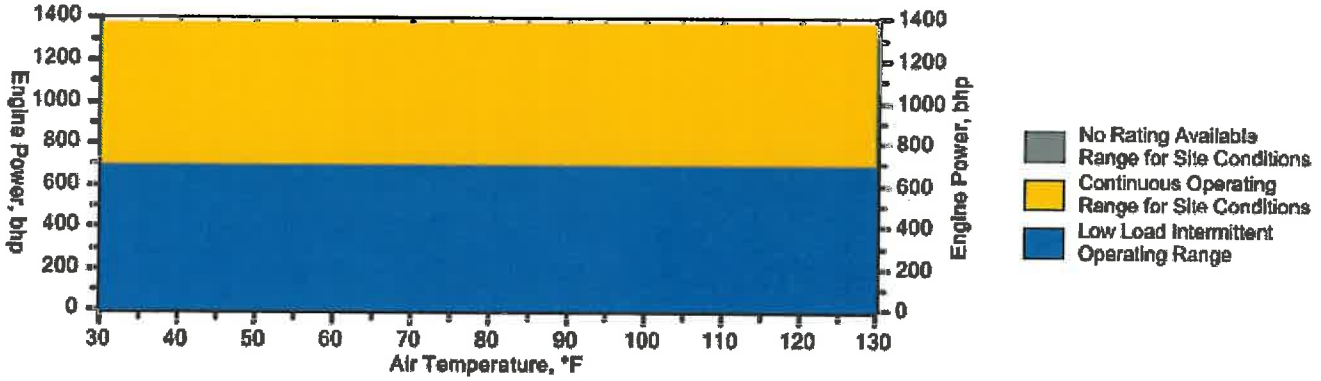
Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site inlet air temperature. 100% rating at maximum inlet air temperature is the maximum engine capability for the specified fuel at site altitude and maximum site inlet air temperature. Maximum rating is the maximum capability at the specified aftercooler inlet temperature for the specified fuel at site altitude and reduced inlet air temperature. Lowest load point is the lowest continuous duty operating load allowed. No overload permitted at rating shown.

For notes information consult page three.

PREPARED BY: Brian Jackson, Williams Compression
Data generated by Gas Engine Rating Pro Version 5.05.00
Ref. Data Set DM8800-07-001, Printed 06Nov2015

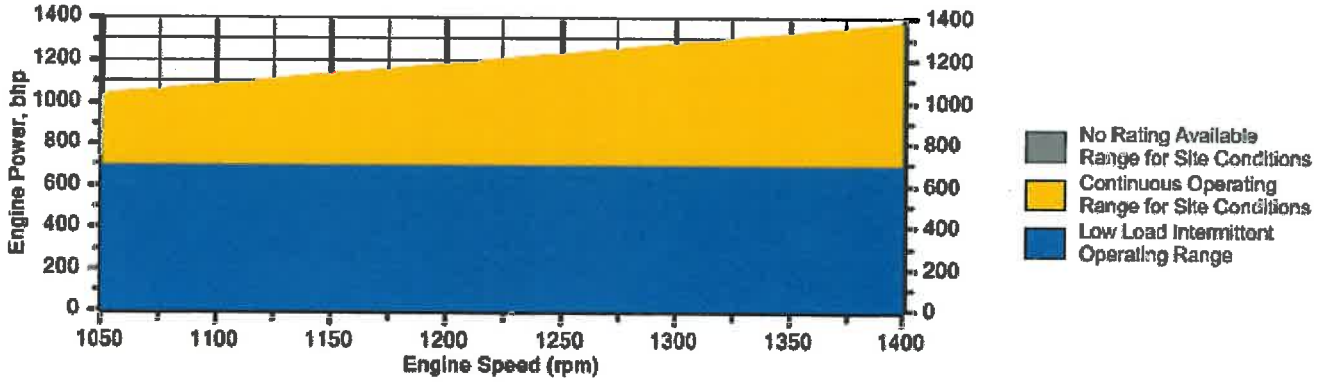
Engine Power vs. Inlet Air Temperature

Data represents temperature sweep at 1500 ft and 1400 rpm



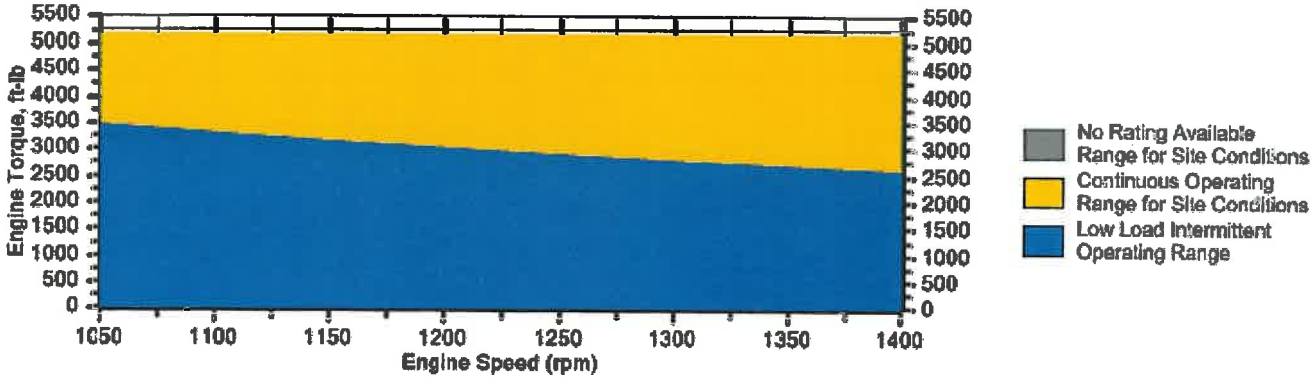
Engine Power vs. Engine Speed

Data represents speed sweep at 1500 ft and 100 °F



Engine Torque vs. Engine Speed

Data represents speed sweep at 1500 ft and 100 °F



Note: At site conditions of 1500 ft and 100°F inlet air temp., constant torque can be maintained down to 1050 rpm. The minimum speed for loading at these conditions is 1050 rpm.

NOTES

1. Engine rating is with two engine driven water pumps. Tolerance is ± 3% of full load.

2. Fuel consumption tolerance is ± 3.0% of full load data.

3. Air flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of ± 5 %.

4. Inlet and Exhaust Restrictions must not exceed A&I limits based on full load flow rates from the standard technical data sheet.

5. Inlet manifold pressure is a nominal value with a tolerance of ± 5 %.

6. Exhaust temperature is a nominal value with a tolerance of (+)63°F, (-)54°F.

7. Exhaust flow value is on a "wet" basis. Flow is a nominal value with a tolerance of ± 6 %.

8. Emissions data is at engine exhaust flange prior to any after treatment.

9. Emission values are based on engine operating at steady state conditions. Fuel methane number cannot vary more than ± 3. Values listed are higher than nominal levels to allow for instrumentation, measurement, and engine-to-engine variations. They indicate "Not to Exceed" values. THC, NMHC, and NMNEHC do not include aldehydes. An oxidation catalyst may be required to meet Federal, State or local CO or HC requirements.

10. VOCs - Volatile organic compounds as defined in US EPA 40 CFR 60, subpart JJJJ

11. Exhaust Oxygen level is the result of adjusting the engine to operate at the specified NOx level. Tolerance is ± 0.5.

12. Heat rejection values are nominal. Tolerances, based on treated water, are ± 10% for jacket water circuit, ± 50% for radiation, ± 20% for lube oil circuit, and ± 5% for aftercooler circuit.

13. Aftercooler heat rejection includes an aftercooler heat rejection factor for the site elevation and inlet air temperature specified. Aftercooler heat rejection values at part load are for reference only. Do not use part load data for heat exchanger sizing.

14. Cooling system sizing criteria are maximum circuit heat rejection for the site, with applied tolerances.

Constituent	Abbrev	Mole %	Norm
Water Vapor	H2O	0.1010	0.1011
Methane	CH4	72.9370	73.0283
Ethane	C2H6	17.1740	17.1955
Propane	C3H8	6.2900	6.2979
Isobutane	iso-C4H1O	0.6170	0.6178
Norbutane	nor-C4H1O	1.4920	1.4939
Isopentane	iso-C5H12	0.2500	0.2503
Norpentane	nor-C5H12	0.3110	0.3114
Hexane	C6H14	0.0610	0.0611
Heptane	C7H16	0.0170	0.0170
Nitrogen	N2	0.4630	0.4636
Carbon Dioxide	CO2	0.1570	0.1572
Hydrogen Sulfide	H2S	0.0000	0.0000
Carbon Monoxide	CO	0.0000	0.0000
Hydrogen	H2	0.0000	0.0000
Oxygen	O2	0.0000	0.0000
Helium	HE	0.0000	0.0000
Neopentane	neo-C5H12	0.0000	0.0000
Octane	C8H18	0.0040	0.0040
Nonane	C9H20	0.0010	0.0010
Ethylene	C2H4	0.0000	0.0000
Propylene	C3H6	0.0000	0.0000
TOTAL (Volume %)		99.8750	100.0000

Fuel Makeup:	Gas Analysis
Unit of Measure:	English
Calculated Fuel Properties	
Caterpillar Methane Number:	57.3
Lower Heating Value (Btu/scf):	1181
Higher Heating Value (Btu/scf):	1301
WOBBE Index (Btu/scf):	1367
THC: Free Inert Ratio:	159.92
Total % Inerts (% N2, CO2, He):	0.62%
RPC (%) (To 905 Btu/scf Fuel):	100%
Compressibility Factor:	0.996
Stoich A/F Ratio (Vol/Vol):	12.23
Stoich A/F Ratio (Mass/Mass):	16.41
Specific Gravity (Relative to Air):	0.745
Specific Heat Constant (K):	1.275

CONDITIONS AND DEFINITIONS

Caterpillar Methane Number represents the knock resistance of a gaseous fuel. It should be used with the Caterpillar Fuel Usage Guide for the engine and rating to determine the rating for the fuel specified. A Fuel Usage Guide for each rating is included on page 2 of its standard technical data sheet.

RPC always applies to naturally aspirated (NA) engines, and turbocharged (TA or LE) engines only when they are derated for altitude and ambient site conditions.

Project specific technical data sheets generated by the Caterpillar Gas Engine Rating Pro program take the Caterpillar Methane Number and RPC into account when generating a site rating.

Fuel properties for Btu/scf calculations are at 60F and 14.696 psia.

Caterpillar shall have no liability in law or equity, for damages, consequently or otherwise, arising from use of program and related material or any part thereof.

FUEL LIQUIDS

Field gases, well head gases, and associated gases typically contain liquid water and heavy hydrocarbons entrained in the gas. To prevent detonation and severe damage to the engine, hydrocarbon liquids must not be allowed to enter the engine fuel system. To remove liquids, a liquid separator and coalescing filter are recommended, with an automatic drain and collection tank to prevent contamination of the ground in accordance with local codes and standards.

To avoid water condensation in the engine or fuel lines, limit the relative humidity of water in the fuel to 80% at the minimum fuel operating temperature.

PREPARED BY: Brian Jackson, Williams Compression
Data generated by Gas Engine Rating Pro Version 5.05.00
Ref. Data Set DM8800-07-001, Printed 06Nov2015

LeROI® Gas Compressors

by Rotary Compression Technologies, Inc.

211 East Russell Rd
Sidney, OH 45365
ph: +1 (937) 498-2555

LRG9-DP Series Reciprocating Compressor

PERFORMANCE

• Brake HP	55 Max.
• Flow (MSCFD)	1000 Max @ STD Inlet Conditions
• Inlet Pressure	Vacuum to 1200 PSIG Max
• Discharge Pressures	1500 PSIG MAOP
• Speed Range	560-1200 RPM's
• Rod Loads	6000 lbs. Max
• Rotation	CW or CCW
• Frame Lubrication	Pump with Spin-on Filter
• Cylinders	Non lubricated

• Suction Valve un-loaders available upon request.

BENEFITS

The LeROI LRG9-DP non-lubricated reciprocating compressors are very cost-effective for handling gas in field gathering, vapor recovery, gas to pipeline sales to 1500 PSIG and other applications. The LRG9-DP compressor comes with a true distance piece and packing case with a 3-seal design standard. The compressor is available in a 35 and 55 horsepower frame with non-lubricated cylinders.

The LeROI LRG9 doesn't restrict you to fixed cylinder configurations. We offer 12 cylinder sizes from 1.50" to 8.50" for unmatched flexibility in a belt-driven compressor.

FEATURES

The **LRG9-DP** can be configured as a single stage compressor with 1, 2, or 3 cylinders. 2-stage compressor with 2 or 3 cylinders and a 3-stage with 3-cylinders. There are two standard packing case designs available Vac-100 PSIG cylinder flange suction pressure and a 50 to 800 PSIG cylinder flange suction pressure. The valves and piston rings are Hoerbiger designs. The piston rings are a two-piece design and the valves are non-metallic and tailored to optimize valve life and performance based on customer supplied conditions. The cylinder heads include two ½" FNPT ports for temperature and or pressure measurements. The cylinder heads include two discharge ports and are reversible for packaging flexibility. The compressor can be configured for future cylinder additions or fixed reduce cylinder number designs. The LRG9-DP is non-lubricated and ideal for wet gas streams and eliminates the need for a crankcase oil make-up system. The lube oil system comes with a spin-on filter and doesn't require additional cooling.

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LeROI is an ISO 9001:2000 registered company

ATTACHMENT M

Air Pollution Control Device Sheet(s)

"29. Fill out the **Air Pollution Control Device Sheet(s)** as Attachment M."

- **OXIDATION CATALYST (1-OXCAT) FOR COMPRESSOR ENGINE CE-01/22E**
  - OXIDATION CATALYST - VENDOR DATA

Williams Ohio Valley Midstream LLC

FRANCIS COMPRESSOR STATION

Application for 45CSR13 NSR Construction Permit

Attachment M - Air Pollution Control Device Sheet

Control Device ID No. (must match Emission Units Table): **1-OXCAT**

Equipment Information

1. Manufacturer: **Catalytic Combustion Corporation**	2. Control Device Name: **OXIDATION CATALYST (1-OXCAT)**
3. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.	
4. On a separate sheet(s) supply all data and calculations used in selecting or designing this collection device.	
5. Provide a scale diagram of the control device showing internal construction.	
6. Submit a schematic and diagram with dimensions and flow rates.	
7. Guaranteed minimum collection efficiency for each pollutant collected: **CO 90%** **NMNEHC 70%** **HCHO 70%**	
8. Attached efficiency curve and/or other efficiency information.	
9. Design inlet volume: **9,216 SCFM**	10. Capacity: **NA**
11. Indicate the liquid flow rate and describe equipment provided to measure pressure drop and flow rate, if any. **NA**	
12. Attach any additional data including auxiliary equipment and operation details to thoroughly evaluate the control equipment.	
13. Description of method of handling the collected material(s) for reuse of disposal. **NA**	

Gas Stream Characteristics

14. Are halogenated organics present?	☐ Yes	☑ No
Are particulates present?	☐ Yes	☑ No
Are metals present?	☐ Yes	☑ No

15. Inlet emission stream parameters:	Maximum	Typical
Pressure (mmHg):	**NA**	**NA**
Heat Content (BTU/scf):	**NA**	**NA**
Oxygen Content (%):	**NA**	**NA**
Moisture Content (%):	**NA**	**NA**
Relative Humidity (%):	**NA**	**NA**

Attachment M - Air Pollution Control Device Sheet - Continued

16. Type of pollutant(s) controlled:	☐ SO2	☐ Odor	
	☐ PM	☑ Other:	**CO, NMNEHC, HCHO**

17. Inlet gas velocity: **NA**	18. Pollutant specific gravity: **VARIES**
19. Gas flow into the collector: **9,216 ACFM**	20. Gas stream temperature: Inlet: **1,007 oF** Outlet: **NA oF**
21. Gas flow rate: Design Maximum: **9,216 ACFM** Average Expected: **9,216 ACFM**	22. Particulate Grain Loading: Inlet: **NA grains/scf** Outlet: **NA grains/scf**

23. Emission rate of each pollutant (specify) into and out of collector:

Pollutant	IN Pollutant g/bhp-hr	IN Pollutant lb/hr	Capture Efficiency	OUT Pollutant g/bhp-hr	OUT Pollutant lb/hr	Control Efficiency
CO	**2.92**	**8.88**	**100%**	**0.29**	**0.89**	**90%**
NMNEHC (VOC w/o HCHO)	**1.01**	**3.07**	**100%**	**0.30**	**0.92**	**70%**
VOC (including HCHO)	**1.41**	**4.29**	**100%**	**0.42**	**1.29**	**70%**
HCHO	**0.40**	**1.22**	**100%**	**0.12**	**0.37**	**70%**

24. Dimensions of stack: **Height NA ft** **Diameter NA ft**

25. Supply a curve showing proposed collection efficiency versus gas volume from 25 to 130 percent of design rating of collector.

26. Complete the table:	Particle Size Distribution	Fraction Efficiency of Collector
Particulate Size Range (microns)	Weight % for Size Range	Weight % for Size Range
0 – 2	**NA**	**NA**
2 – 4	**NA**	**NA**
4 – 6	**NA**	**NA**
6 – 8	**NA**	**NA**
8 – 10	**NA**	**NA**
10 – 12	**NA**	**NA**
12 – 16	**NA**	**NA**
16 – 20	**NA**	**NA**
20 – 30	**NA**	**NA**
30 – 40	**NA**	**NA**
40 – 50	**NA**	**NA**
50 – 60	**NA**	**NA**
60 – 70	**NA**	**NA**
70 – 80	**NA**	**NA**
80 – 90	**NA**	**NA**
90 – 100	**NA**	**NA**
>100	**NA**	**NA**

Attachment M - Air Pollution Control Device Sheet - Continued

27. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):

NA

28. Describe the collection material disposal system:

NA

29. Describe the collection material disposal system: **NA**

30. Proposed Monitoring, Recordkeeping, Reporting, and Testing

Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
REPORTING:	TESTING:

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING	Please describe any proposed emissions testing for this process equipment on air pollution control device.

31. Manufacturer's Guaranteed Collection Efficiency for each air pollutant.

CO ~100% **NMNEHC ~100%** **HCHO ~100%**

32. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

CO ≥90% **NMNEHC ≥70%** **HCHO ≥70%**

33. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

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E-mail : bweninger@catalyticcombustion.com

CATALYTIC COMBUSTION
EMISSION TECHNOLOGIES

To Williams
Attn
Via E-mail

Our Ref. QT-115-2264-1
Date : 12/7/2015

PERFORMANCE EXPECTATION

For: Location: Francis 1,2,3

Engine Operating Parameters and Catalyst Descpription

Engine Manufacturer	Caterpillar		Substrate Type	Folded Metal Foil
Engine Model	G3516B		Cell Pattern	320 cpsi Herringbone
Horsepower	1380	bhp	Banding	CCC C-Channel Design
Speed	1400	rpm	Catalyst Dimensions	23.875 x 14.875 x 3.50"
Exhaust Flowrate	9,216	acfm	Quantity Required	3 per Unit
Exhaust Temperature	1007	°F	Formulation	HFX4
Fuel	Field Gas			

Engine Output, Fresh Catalyst Performance Expectation and Warranted Emissions

	Raw Exhuast	Performance	Performance
NOx	0.5 g/bhp-hr		
CO	2.92 g/bhp-hr	90 % Conversion	0.29 g/bhp-hr
THC	4.53 g/bhp-hr		
NMNEHC	1.01 g/bhp-hr	70 % Conversion	0.30 g/bhp-hr
HCHO	0.4 g/bhp-hr	70 % Conversion	0.12 g/bhp-hr
Oxygen	9.1 %		

* Per user supplied information

Notes and Cautions

Note: Catalyst performance is dependent upon the engine being run in accordance with the manufacturer's specifications for new engines.

Issued by

Name : Brian Weninger

Date : 12/7/15

ATTACHMENT N

Supporting Emissions Calculations

"30. Provide all **Supporting Emissions Calculations** as Attachment N."

- **Emission Summary Spreadsheets**
  - Potential to Emit (PTE) – CRITERIA – CONTROLLED
  - Potential to Emit (PTE) – CRITERIA – PRE-CONTROLLED
  - Potential to Emit (PTE) – HAZARDOUS AIR POLLUTANTS (HAP) – CONTROLLED
  - Potential to Emit (PTE) – HAZARDOUS AIR POLLUTANTS (HAP) – PRE-CONTROLLED
  - Potential to Emit (PTE) – GREENHOUSE GASES (GHG) – CONTROLLED
  - Potential to Emit (PTE) – GREENHOUSE GASES (GHG) – PRE-CONTROLLED
- **Unit-Specific Emission Spreadsheets**
  - Compressor Engine Emissions – 1,380 bhp CAT G3516B (CE-01/22E)
  - Compressor Rod Packing and Engine Crankcase Leaks (RPC-3/23E)
  - Start/Stop/Maintenance (Including Blowdown) (SSM-2/24E)
- **Fugitive Emissions**
  - Piping and Equipment Fugitives (FUG-3/25E)
- **AP-42 and GHG Emission Factors**

Potential to Emit (PTE) – CRITERIA – CONTROLLED

Unit ID	Point ID	Description	Site Rating	NOX		CO		VOC		SO2		PM10/2.5	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CE-01	22E	CAT G3516B Compressor Engine (OxCat)	1,380 bhp	1.52	6.66	0.89	3.89	1.29	5.64	0.01	0.03	0.11	0.49
RPC-3	23E	Rod Packing/Crankcase Leaks	2 Recip	---	---	---	---	1.32	5.76	---	---	---	---
SSM-2	24E	Start/Stop/Maintenance (i.e., Blowdown)	2 Recip	---	---	---	---	---	16.02	---	---	---	---
		POINT SOURCE SUBTOTAL - FRANCIS CS:		**1.52**	**6.66**	**0.89**	**3.89**	**2.60**	**27.42**	**0.01**	**0.03**	**0.11**	**0.49**
		POINT SOURCE SUBTOTAL - OAK GROVE GP:		649.96	121.26	1,285.92	192.57	212.22	69.94	1.67	0.76	21.43	10.68
		POINT SOURCE SUBTOTAL - INDEPENDENCE CS:		---	---	---	---	0.23	1.00	---	---	---	---
		TOTAL - POINT SOURCE EMISSIONS:		**651.48**	**127.93**	**1,286.81**	**196.47**	**215.05**	**98.36**	**1.68**	**0.79**	**21.55**	**11.18**
		PSD THRESHOLD:			250 tpy		250 tpy		250 tpy		250 tpy		250 tpy
FUG-3	25E	Piping and Equipment Fugitives - Gas	---	---	---	---	---	0.63	2.77	---	---	---	---
		FUGITIVE SOURCE SUBTOTAL - FRANCIS CS:		---	---	---	---	**0.63**	**2.77**	---	---	---	---
		FUGITIVE SOURCE SUBTOTAL - OAK GROVE GP:		---	---	---	---	13.43	42.50	---	---	---	---
		FUGITIVE SOURCE SUBTOTAL - INDEPENDENCE CS:		---	---	---	---	0.01	0.06	---	---	---	---
		TOTAL - FUGITIVE EMISSIONS:		---	---	---	---	**14.07**	**45.34**	---	---	---	---
		GRAND TOTAL - FRANCIS CS:		**1.52**	**6.66**	**0.89**	**3.89**	**3.24**	**30.19**	**0.01**	**0.03**	**0.11**	**0.49**
		GRAND TOTAL - OAK GROVE GP:		649.96	121.26	1285.92	192.57	225.64	112.44	1.67	0.76	21.43	10.68
		GRAND TOTAL - INDEPENDENCE CS:		---	---	---	---	0.24	1.06	---	---	---	---
		GRAND TOTAL - PLANT-WIDE EMISSIONS:		**651.48**	**127.93**	**1,286.81**	**196.47**	**229.12**	**143.69**	**1.68**	**0.79**	**21.55**	**11.18**
		WV NSR THRESHOLD:		6 lb/hr *AND* 10 tpy		6 lb/hr *AND* 10 tpy		6 lb/hr *AND* 10 tpy		6 lb/hr *AND* 10 tpy		6 lb/hr *AND* 10 tpy	
		TVOP THRESHOLD:			100 tpy		100 tpy		100 tpy		100 tpy		100 tpy

Notes: 1 - Emissions are based on operation at 100% of rated load for 8,760 hr/yr; except.

a - Start/Stop/Maintenance (SSM-2/24E) is intermittent and infrequent.

2 - VOC is volatile organic compounds, as defined by EPA, and includes HCHO (formaldehyde).

3 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5.

4 - Intermittent Flare Operations distorts the lb/hr emission calculations from the OGGP.

Potential to Emit (PTE) – CRITERIA – PRE-CONTROLLED

Unit ID	Point ID	Description	Site Rating	NOX		CO		VOC		SO2		PM10/2.5	
				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CE-01	22E	CAT G3516B Compressor Engine (OxCat)	1,380 bhp	1.52	6.66	8.88	38.91	4.29	18.79	0.01	0.03	0.11	0.49
RPC-3	23E	Rod Packing/Crankcase Leaks	2 Recip	---	---	---	---	1.32	5.76	---	---	---	---
SSM-2	24E	Start/Stop/Maintenance (i.e., Blowdown)	2 Recip	---	---	---	---	---	16.02	---	---	---	---
		POINT SOURCE SUBTOTAL - FRANCIS CS:		**1.52**	**6.66**	**8.88**	**38.91**	**5.61**	**40.57**	**0.01**	**0.03**	**0.11**	**0.49**
		POINT SOURCE SUBTOTAL - OAK GROVE GP:		649.96	125.34	1,285.92	196.73	17,763.49	2,087.61	1.67	0.77	21.43	10.86
		POINT SOURCE SUBTOTAL - INDEPENDENCE CS:		---	---	---	---	0.06	0.06	---	---	---	---
		TOTAL - POINT SOURCE EMISSIONS:		**651.48**	**132.01**	**1,294.81**	**235.64**	**17,769.15**	**2,128.23**	**1.68**	**0.80**	**21.55**	**11.35**
		PSD THRESHOLD:			250 tpy		250 tpy		250 tpy		250 tpy		250 tpy
FUG-3	25E	Piping and Equipment Fugitives - Gas	---	---	---	---	---	1.32	5.77	---	---	---	---
		FUGITIVE SOURCE SUBTOTAL - FRANCIS CS:		---	---	---	---	**1.32**	**5.77**	---	---	---	---
		FUGITIVE SUBTOTAL - OAK GROVE GP:		---	---	---	---	28.58	125.17	---	---	---	---
		FUGITIVE SOURCE SUBTOTAL - INDEPENDENCE CS:		---	---	---	---	0.01	0.06	---	---	---	---
		TOTAL - FUGITIVE EMISSIONS:		---	---	---	---	**29.91**	**131.00**	---	---	---	---
		GRAND TOTAL - FRANCIS CS:		**1.52**	**6.66**	**8.88**	**38.91**	**6.92**	**46.34**	**0.01**	**0.03**	**0.11**	**0.49**
		GRAND TOTAL - OAK GROVE GP:		649.96	125.34	1,285.92	196.73	17,792.07	2,212.78	1.67	0.77	21.43	10.86
		GRAND TOTAL - INDEPENDENCE CS:		---	---	---	---	0.07	0.12	---	---	---	---
		GRAND TOTAL - PLANT-WIDE EMISSIONS:		**651.48**	**132.01**	**1,294.81**	**235.64**	**17,799.06**	**2,259.24**	**1.68**	**0.80**	**21.55**	**11.35**
		WV NSR THRESHOLD:		**6 lb/hr *AND* 10 tpy**		**6 lb/hr *AND* 10 tpy**		**6 lb/hr *AND* 10 tpy**		6 lb/hr *AND* 10 tpy		**6 lb/hr *AND* 10 tpy**	
		TVOP THRESHOLD:			**100 tpy**		**100 tpy**		**100 tpy**		100 tpy		100 tpy

Notes: 1 - Emissions are based on operation at 100% of rated load for 8,760 hr/yr; except.

a - Start/Stop/Maintenance (SSM-2/24E) is intermittent and infrequent.

2 - VOC is volatile organic compounds, as defined by EPA, and includes HCHO (formaldehyde).

3 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5.

4 - Intermittent Flare Operations distorts the lb/hr emission calculations from the OGGP.

Potential to Emit (PTE) – HAZARDOUS AIR POLLUTANTS (HAP) – CONTROLLED

Unit ID	Acetaldehyde		Acrolein		Benzene		Ethylbenzene		Formaldehyde		n-Hexane		Methanol		Toluene		2,2,4-TMP		Xylenes		Other HAP		Total HAP	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CE-01	0.03	0.12	0.02	0.08	1.5E-03	0.01	1.3E-04	5.9E-04	0.37	1.60	3.8E-03	0.02	0.01	0.04	1.4E-03	0.01	8.5E-04	3.7E-03	6.2E-04	2.7E-03	3.2E-03	0.01	0.43	1.89
RPC-3	---	---	---	---	1.8E-03	0.01	1.8E-03	0.01	0.01	0.05	0.02	0.07	---	---	1.8E-03	0.01	1.8E-03	0.01	1.8E-03	0.01	---	---	0.04	0.15
SSM-2	---	---	---	---	---	0.02	---	0.02	---	---	---	0.19	---	---	---	0.02	---	0.02	---	0.02	---	---	---	0.29
FCS:	**0.03**	**0.12**	**0.02**	**0.08**	**3.3E-03**	**0.03**	**1.9E-03**	**0.03**	**0.38**	**1.65**	**0.02**	**0.28**	**0.01**	**0.04**	**3.2E-03**	**0.03**	**2.6E-03**	**0.03**	**2.4E-03**	**0.03**	**3.2E-03**	**0.01**	**0.47**	**2.33**
OGGP:	---	---	---	---	5.55	1.76	7.14	1.94	0.41	0.12	6.93	3.60	---	---	6.36	1.86	7.60	2.00	7.16	1.95	0.03	0.01	41.18	13.24
ICS:	---	---	---	---	0.01	0.06	0.01	0.06	---	---	0.01	0.06	---	---	0.01	0.06	0.01	0.06	0.01	0.06	---	---	0.08	0.33
PS-TOT:	**0.03**	**0.12**	**0.02**	**0.08**	**5.56**	**1.85**	**7.16**	**2.03**	**0.79**	**1.77**	**6.96**	**3.93**	**0.01**	**0.04**	**6.37**	**1.94**	**7.62**	**2.08**	**7.18**	**2.03**	**0.03**	**0.02**	**41.73**	**15.90**
PSD:		na		na		na		na		na		na		na		na		na		na		na		na
FUG-3	---	---	---	---	3.1E-03	0.01	3.1E-03	0.01	---	---	1.8E-02	0.08	---	---	3.1E-03	0.01	3.1E-03	0.01	3.1E-03	0.01	---	---	0.03	0.15
FCS:	**---**	**---**	**---**	**---**	**3.1E-03**	**0.01**	**3.1E-03**	**0.01**	**---**	**---**	**1.8E-02**	**0.08**	**---**	**---**	**3.1E-03**	**0.01**	**3.1E-03**	**0.01**	**3.1E-03**	**1.4E-02**	**---**	**---**	**0.03**	**0.15**
OGGP:	---	---	---	---	0.02	0.10	0.02	0.10	---	---	0.02	0.10	---	---	0.02	0.10	0.02	0.10	0.02	0.10	---	---	0.14	0.60
ICS:	---	---	---	---	8.1E-04	3.5E-03	8.1E-04	3.5E-03	---	---	8.1E-04	3.5E-03	---	---	8.1E-04	3.5E-03	8.1E-04	3.5E-03	8.1E-04	3.5E-03	---	---	4.9E-03	0.02
FUG-TOT:	**---**	**---**	**---**	**---**	**0.03**	**0.12**	**0.03**	**0.12**	**---**	**---**	**0.04**	**0.18**	**---**	**---**	**0.03**	**0.12**	**0.03**	**0.12**	**0.03**	**0.12**	**---**	**---**	**0.18**	**0.77**
FCS:	**0.03**	**0.12**	**0.02**	**0.08**	**6.4E-03**	**0.05**	**5.0E-03**	**0.04**	**0.38**	**1.65**	**0.04**	**0.36**	**0.01**	**0.04**	**6.3E-03**	**0.05**	**5.7E-03**	**0.04**	**5.5E-03**	**0.04**	**3.2E-03**	**0.01**	**0.50**	**2.48**
OGGP:	---	---	---	---	5.57	1.86	7.17	2.04	0.41	0.12	6.95	3.70	---	---	6.38	1.96	7.63	2.10	7.19	2.05	0.03	0.01	41.32	13.84
ICS:	---	---	---	---	0.01	0.06	0.01	0.06	---	---	0.01	0.06	---	---	0.01	0.06	0.01	0.06	0.01	0.06	---	---	0.08	0.35
TOTAL:	**0.03**	**0.12**	**0.02**	**0.08**	**5.59**	**1.97**	**7.19**	**2.14**	**0.79**	**1.77**	**7.00**	**4.12**	**0.01**	**0.04**	**6.40**	**2.06**	**7.65**	**2.20**	**7.21**	**2.15**	**0.03**	**0.02**	**41.90**	**16.67**
NSR:	2 lb/hr *OR* 5 tpy		2 lb/hr *OR* 5 tpy		2 lb/hr *OR* 0.5 tpy		2 lb/hr *OR* 5 tpy		2 lb/hr *OR* 0.5 tpy		2 lb/hr *OR* 5 tpy		2 lb/hr *OR* 5 tpy		2 lb/hr *OR* 5 tpy		2 lb/hr *OR* 5 tpy		2 lb/hr *OR* 5 tpy		2 lb/hr *OR* 5 tpy		2 lb/hr *OR* 5 tpy	
TVOP:		10		10		10		10		10		10		10		10		10		10		10		25

Potential to Emit (PTE) – HAZARDOUS AIR POLLUTANTS (HAP) – PRE-CONTROLLED

Unit ID	Acetaldehyde		Acrolein		Benzene		Ethylbenzene		Formaldehyde		n-Hexane		Methanol		Toluene		2,2,4-TMP		Xylenes		Other HAP		Total HAP	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CE-01	0.03	0.12	0.02	0.08	1.5E-03	0.01	1.3E-04	5.9E-04	0.37	1.60	3.8E-03	0.02	0.01	0.04	1.4E-03	0.01	8.5E-04	3.7E-03	6.2E-04	2.7E-03	3.2E-03	0.01	0.43	1.89
RPC-3	---	---	---	---	1.8E-03	0.01	1.8E-03	0.01	0.01	0.05	0.02	0.07	---	---	1.8E-03	0.01	1.8E-03	0.01	1.8E-03	0.01	---	---	0.04	0.15
SSM-2	---	---	---	---	---	0.02	---	0.02	---	---	---	0.19	---	---	---	0.02	---	0.02	---	0.02	---	---	---	0.29
FCS:	**0.03**	**0.12**	**0.02**	**0.08**	**3.3E-03**	**0.03**	**1.9E-03**	**0.03**	**0.38**	**1.65**	**0.02**	**0.28**	**0.01**	**0.04**	**3.2E-03**	**0.03**	**2.6E-03**	**0.03**	**2.4E-03**	**0.03**	**3.2E-03**	**0.01**	**0.47**	**2.33**
OGGP:	---	---	---	---	449.95	52.81	610.20	71.19	0.06	0.27	549.68	65.92	---	---	531.11	62.12	656.47	76.51	612.19	71.42	0.01	0.00	3409.68	400.33
ICS:	---	---	---	---	0.01	0.06	0.01	0.06	---	---	0.01	0.06	---	---	0.01	0.06	0.01	0.06	0.01	0.06	---	---	0.08	0.33
PS-TOT:	**0.03**	**0.12**	**0.02**	**0.08**	**449.97**	**52.90**	**610.22**	**71.28**	**0.44**	**1.91**	**549.71**	**66.26**	**0.01**	**0.04**	**531.13**	**62.21**	**656.48**	**76.59**	**612.20**	**71.51**	**0.01**	**0.02**	**3410.22**	**403.00**
PSD:		na		na		na		na		na		na		na		na		na		na		na		na
FUG-3	---	---	---	---	4.2E-03	0.02	4.2E-03	0.02	---	---	0.03	0.12	---	---	4.2E-03	0.02	4.2E-03	0.02	4.2E-03	0.02	---	---	0.05	0.21
FCS:	---	---	---	---	**4.2E-03**	**0.02**	**4.2E-03**	**0.02**	---	---	**0.03**	**0.12**	---	---	**4.2E-03**	**0.02**	**4.2E-03**	**0.02**	**4.2E-03**	**0.02**	---	---	**0.05**	**0.21**
OGGP:	---	---	---	---	0.02	0.10	0.02	0.10	---	---	0.02	0.10	---	---	0.02	0.10	0.02	0.10	0.02	0.10	---	---	0.14	0.60
ICS:	---	---	---	---	8.1E-04	3.5E-03	8.1E-04	3.5E-03	---	---	8.1E-04	3.5E-03	---	---	8.1E-04	3.5E-03	8.1E-04	3.5E-03	8.1E-04	3.5E-03	---	---	4.9E-03	0.02
FUG-TOT:	---	---	---	---	**0.03**	**0.12**	**0.03**	**0.12**	---	---	**0.05**	**0.22**	---	---	**0.03**	**0.12**	**0.03**	**0.12**	**0.03**	**0.12**	---	---	**0.19**	**0.83**
FCS:	**0.03**	**0.12**	**0.02**	**0.08**	**7.5E-03**	**0.05**	**6.1E-03**	**0.05**	**0.38**	**1.65**	**0.05**	**0.40**	**0.01**	**0.04**	**7.3E-03**	**0.05**	**6.8E-03**	**0.05**	**6.6E-03**	**0.05**	**3.2E-03**	**0.01**	**0.51**	**2.54**
OGGP:	---	---	---	---	449.97	52.91	610.22	71.29	0.06	0.27	549.70	66.02	---	---	531.13	62.22	656.49	76.61	612.21	71.52	0.01	0.00	3409.82	400.94
ICS:	---	---	---	---	0.01	0.06	0.01	0.06	---	---	0.01	0.06	---	---	0.01	0.06	0.01	0.06	0.01	0.06	---	---	0.08	0.35
TOTAL:	**0.03**	**0.12**	**0.02**	**0.08**	**449.99**	**53.02**	**610.24**	**71.40**	**0.44**	**1.91**	**549.76**	**66.48**	**0.01**	**0.04**	**531.15**	**62.33**	**656.51**	**76.71**	**612.23**	**71.63**	**0.01**	**0.02**	**3410.41**	**403.83**
NSR:	2 lb/hr *OR* 5 tpy		2 lb/hr *OR* 5 tpy		2 lb/hr *OR* 0.5 tpy		2 lb/hr *OR* 5 tpy		2 lb/hr *OR* 0.5 tpy		2 lb/hr *OR* 5 tpy		2 lb/hr *OR* 5 tpy		2 lb/hr *OR* 5 tpy		2 lb/hr *OR* 5 tpy		2 lb/hr *OR* 5 tpy		2 lb/hr *OR* 5 tpy		2 lb/hr *OR* 5 tpy	
TVOP:		10		10		10		10		10		10		10		10		10		10		10		10

Potential to Emit (PTE) – GREENHOUSE GASES (GHG) – CONTROLLED

Unit ID	Point ID	Description	Heat Input MMBtu/hr (HHV)	Hours of Operation hr/yr	kg/MMBtu: GWP: CO2 tpy	53.06 1 CO2e tpy	kg/MMBtu: GWP: CH4 tpy	1.00E-03 25 CO2e tpy	kg/MMBtu: GWP: N2O tpy	1.00E-04 298 CO2e tpy	TOTAL CO2e tpy
CE-01	22E	CAT G3516B Compressor Engine (OxCat)	11.29	8,760	6,703	6,703	32	796	0.01	3	7,502
RPC-3	23E	Rod Packing/Crankcase Leaks	---	8,760	58	58	12	289	---	---	347
SSM-2	24E	Start/Stop/Maintenance (i.e., Blowdown)	---	---	---	---	35.3	881	---	---	881
		POINT SOURCE SUBTOTAL - FRANCIS CS:			**6,761**	**6,761**	**79**	**1,966**	**0.01**	**3**	**8,731**
		POINT SOURCE SUBTOTAL - OAK GROVE GP:			218,331	218,331	371	9,273	69	20,441	248,045
		POINT SOURCE SUBTOTAL - INDEPENDENCE CS:			16	16	262	6,561	---	---	6,577
		TOTAL - POINT SOURCE EMISSIONS:			**225,108**	**225,108**	**712**	**17,801**	**69**	**20,444**	**263,352**
FUG-3	25E	Piping and Equipment Fugitives - Gas	---	8,760	0.03	0.03	1	21	---	---	21
		FUGITIVE SOURCE SUBTOTAL - FRANCIS CS:			**0.03**	**0.03**	**1**	**21**	**---**	**---**	**21**
		FUGITIVE SOURCE SUBTOTAL - OAK GROVE GP:			0.4	0.4	45	1,118	---	---	1,118
		FUGITIVE SOURCE SUBTOTAL - INDEPENDENCE CS:			0.2	0.2	30	750	---	---	750
		TOTAL - FUGITIVE EMISSIONS:			**0.6**	**0.6**	**76**	**1,888**	**---**	**---**	**1,889**
		GRAND TOTAL - FRANCIS CS:			**6,761**	**6,761**	**80**	**1,987**	**0.01**	**3**	**8,751**
		GRAND TOTAL - OAK GROVE GP:			218,331	218,331	416	10,391	69	20,441	249,163
		GRAND TOTAL - INDEPENDENCE CS:			16	16	292	7,311	---	---	7,327
		GRAND TOTAL - PLANT-WIDE EMISSIONS:			**225,108**	**225,108**	**788**	**19,689**	**69**	**20,444**	**265,241**
		TVOP THRESHOLD:			na		na		na		**100,000**
		PSD THRESHOLD:			(na	OR	na	OR	na	) AND	na

Notes: 1 - PSD Thresholds and Title V Major Source Thresholds are only applicable if other regulated air pollutants exceed the corresponding Thresholds.

Potential to Emit (PTE) – GREENHOUSE GASES (GHG) – PRE-CONTROLLED

Unit ID	Point ID	Description	Heat Input MMBtu/hr (HHV)	Hours of Operation hr/yr	kg/MMBtu: 53.06 GWP: 1 CO2 tpy	CO2e tpy	kg/MMBtu: 1.00E-03 GWP: 25 CH4 tpy	CO2e tpy	kg/MMBtu: 1.00E-04 GWP: 298 N2O tpy	CO2e tpy	TOTAL CO2e tpy
CE-01	22E	CAT G3516B Compressor Engine (OxCat)	11.29	8,760	6,703	6,703	32	796	0.01	3	7,502
RPC-3	23E	Rod Packing/Crankcase Leaks	---	8,760	58	58	12	289	---	---	347
SSM-2	24E	Start/Stop/Maintenance (i.e., Blowdown)	---	---	---	---	35.3	881	---	---	881
		POINT SOURCE SUBTOTAL - FRANCIS CS:			**6,761**	**6,761**	**79**	**1,966**	**0.01**	**3**	**8,731**
		POINT SOURCE SUBTOTAL - OAK GROVE GP:			136,520	136,520	2,841	70,962	0	64	207,600
		POINT SOURCE SUBTOTAL - INDEPENDENCE CS:			3	3	468	11,704	0.0	0	11,707
		TOTAL - POINT SOURCE EMISSIONS:			**143,285**	**143,285**	**3,387**	**84,632**	**0**	**68**	**228,037**
FUG-3	25E	Piping and Equipment Fugitives - Gas	---	8,760	0.08	0.08	2	57	---	---	57
		FUGITIVE SOURCE SUBTOTAL - FRANCIS CS:			**0.08**	**0.08**	**2**	**57**	**0**	**0**	**57**
		FUGITIVE SOURCE SUBTOTAL - OAK GROVE GP:			1.1	0.4	135	1,118	---	---	3,380
		FUGITIVE SOURCE SUBTOTAL - INDEPENDENCE CS:			0.2	0.2	30	750	---	---	750
		TOTAL - FUGITIVE EMISSIONS:			**1.4**	**0.7**	**167**	**1,925**	**---**	**---**	**4,187**
		GRAND TOTAL - FRANCIS CS:			**6,761**	**6,761**	**81**	**2,023**	**0.01**	**3**	**8,788**
		GRAND TOTAL - OAK GROVE GP:			136,521	136,521	2,976	72,080	0	64	210,979
		GRAND TOTAL - INDEPENDENCE CS:			4	4	498	12,454	---	---	12,457
		GRAND TOTAL - PLANT-WIDE EMISSIONS:			**143,286**	**143,285**	**3,555**	**86,557**	**0**	**68**	**232,224**
		TVOP THRESHOLD:			na		na		na		**100,000**
		PSD THRESHOLD: (			na	OR	na	OR	na	) AND	na

Notes: 1 - PSD Thresholds and Title V Major Source Thresholds are only applicable if other regulated air pollutants exceed the corresponding Thresholds.

Compressor Engine Emissions – 1,380 bhp CAT G3516B (CE-01/22E)

Unit ID (Point ID)	Description	Reference	Pollutant	Pre-Controlled Emissions				Control Efficiency	Controlled Emissions			
				g/bhp-hr	lb/MMBtu	lb/hr	tpy		g/bhp-hr	lb/MMBtu	lb/hr	tpy
CE-01/22E	Engine 01 Caterpillar (CAT) G3516B 1,380 bhp 1,400 rpm 4SLB / AFRC Oxidation Catalyst Manufactured/Modified After July 1, 2010 NSPS JJJJ Affected 8,760 hr/yr 1,020 Btu/scf (HHV) 8,182 Btu/bhp-hr 11.29 MMBtu/hr (HHV) 98,911 MMBtu/yr (HHV) 11,070 scf/hr 0.27 MMscfd 1.86 MMscf/wk 96.97 MMscf/yr	Vendor Data	NOx	0.50	0.13	1.52	6.66	0.0%	0.50	0.13	1.52	6.66
		Vendor Data	CO	2.92	0.79	8.88	38.91	90.0%	0.29	0.08	0.89	3.89
		Vendor Data	THC	4.53	1.22	13.78	60.37	15.6%	3.82	1.03	11.63	50.94
		Vendor Data	NMHC	2.14	0.58	6.51	28.52	33.0%	1.43	0.39	4.36	19.10
		Vendor Data	NMNEHC	1.01	0.27	3.07	13.46	70.0%	0.30	0.08	0.92	4.04
		NMNEHC+HCHO	VOC	1.41	0.38	4.29	18.79	70.0%	0.42	0.11	1.29	5.64
		AP-42 Table 3.2-2	SO2	2.2E-03	5.88E-04	0.01	0.03	---	2.2E-03	5.88E-04	0.01	0.03
		AP-42 Table 3.2-2	PM10/2.5	0.04	9.99E-03	0.11	0.49	---	0.04	9.99E-03	0.11	0.49
		AP-42 Table 3.2-2	Acetaldehyde	0.03	8.36E-03	0.09	0.41	70.0%	0.01	2.51E-03	0.03	0.12
		AP-42 Table 3.2-2	Acrolein	0.02	5.14E-03	0.06	0.25	70.0%	0.01	1.54E-03	0.02	0.08
		AP-42 Table 3.2-2	Benzene	1.6E-03	4.40E-04	5.0E-03	0.02	70.0%	4.9E-04	1.32E-04	1.5E-03	0.01
		AP-42 Table 3.2-2	Ethylbenzene	1.5E-04	3.97E-05	4.5E-04	2.0E-03	70.0%	4.4E-05	1.19E-05	1.3E-04	5.9E-04
		Vendor Data	Formaldehyde	0.40	0.05	1.22	5.33	70.0%	0.12	0.02	0.37	1.60
		AP-42 Table 3.2-2	n-Hexane	4.1E-03	1.11E-03	0.01	0.05	70.0%	1.2E-03	3.33E-04	3.8E-03	0.02
		AP-42 Table 3.2-2	Methanol	0.01	2.50E-03	0.03	0.12	70.0%	2.8E-03	7.50E-04	0.01	0.04
		AP-42 Table 3.2-2	Toluene	1.5E-03	4.08E-04	4.6E-03	0.02	70.0%	4.5E-04	1.22E-04	1.4E-03	0.01
		AP-42 Table 3.2-2	2,2,4-TMP	9.3E-04	2.50E-04	2.8E-03	0.01	70.0%	2.8E-04	7.50E-05	8.5E-04	3.7E-03
		AP-42 Table 3.2-2	Xylenes	6.8E-04	1.84E-04	2.1E-03	0.01	70.0%	2.0E-04	5.52E-05	6.2E-04	2.7E-03
		AP-42 Table 3.2-2	Other HAP	3.5E-03	9.34E-04	0.01	0.05	70.0%	1.0E-03	2.80E-04	3.2E-03	0.01
		Sum	Total HAP	0.47	0.07	1.44	6.29	70.0%	0.14	0.02	0.43	1.89
		Vendor Data	CO2	503	116.89	1,530	6,703	---	503	116.89	1,530	6,703
		THC-NMHC	CH4	2.39	0.64	7.27	31.85	---	2.39	0.64	7.27	31.85
		40CFR98 - Table C-2	N2O	8.2E-04	2.20E-04	2.5E-03	0.01	---	8.2E-04	2.20E-04	2.5E-03	0.01
		40CFR98 - Table A-1	CO2e	563	133.05	1,713	7,502	---	563	133.05	1,713	7,502

Notes: 1) Fuel Heating Value may vary; 1,020 MMBtu/scf is at the low end of the range and results in a conserservative fule consumption estimate.
2) VOC is the sum of NMNEHC (non-methane non-ethane hydrocarbons) and formaldehyde (HCHO).

Compressor Rod Packing and Engine Crankcase Leaks (RPC-3/23E)

Inlet Gas and Flash Gas

Unit ID	Unit Description	Number of Compressors	Cylinders per Compressor	scfh per Cylinder	Contingency	Total Rod Packing Leak Rate	VOC 16,500 (Inlet) 47,500 (Flash) lb/MMscf		HCHO na na lb/MMscf		n-Hexane 200 (Inlet) 600 (Flash) lb/MMscf		BTEX,TMP (Ea) 20 (Inlet) 20 (Flash) lb/MMscf		Total HAP 300 (Inlet) 700 (Flash) lb/MMscf		CO2 300 (Inlet) 300 (Flash) lb/MMscf		CH4 36,500 (Inlet) 18,900 (Flash) lb/MMscf		CO2e 912,800 (Inlet) 472,800 (Flash) lb/MMscf	
						MMscf/yr	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
RPC-3/23E	Rod Packing	1	4	15	15%	0.60	1.14	4.99	na	na	0.01	0.06	1.4E-03	0.01	0.02	0.09	0.02	0.1	3	11	63	276
	Rod Packing	1	3	15	15%	0.03	0.14	0.61	na	na	1.8E-03	0.01	5.9E-05	2.6E-04	2.1E-03	0.01	8.9E-04	3.9E-03	0.06	0.24	1	6

Combustion Gas

Unit ID	Unit Description	Total BHP	Crankcase Leak Rate 0.50 scf/bhp-hr	Safety Factor	VOC 21.55 lb/MMscf		HCHO 6.11 lb/MMscf		n-Hexane 0.06 lb/MMscf		BTEX,TMP (Ea) 0.21 lb/MMscf		Total HAP 7.21 lb/MMscf		CO2 7,689 lb/MMscf		CH4 37 lb/MMscf		CO2e 8,603 lb/MMscf	
			MMscf/yr		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
RPC-3/23E	Crankcase	1,380	6.04	250%	0.04	0.16	0.01	0.05	1.1E-04	4.8E-04	3.6E-04	1.6E-03	0.01	0.05	13	58	0.1	0.3	15	65

	VOC		HCHO		n-Hexane		BTEX,TMP (Ea)		Total HAP		CO2		CH4		CO2e	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
TOTAL RPC-3/23E:	**1.32**	**5.76**	**0.01**	**0.05**	**0.02**	**0.07**	**1.8E-03**	**0.01**	**0.04**	**0.15**	**13**	**58**	**3**	**12**	**79**	**347**

Notes:

1 - RPC is a broad category covering leaks of natural gas from sealed surfaces, such as packing and gaskets, resulting from the wear of mechanical joints, seals, and rotating surfaces over time. It also includes the crankcase emissions from reciprocating engines.

2 - Emission are based upon 40CFR98, Subpart W and manufacturer's data.

3 - To be conservative, and to account for potential future changes, the following "worst-case" gas characteristics were assumed:

Pollutant	Worst-Case Inlet Gas Composition	Worst-Case Flash Gas Composition
CO2	300 lb/MMscf	300 lb/MMscf
CH4	36,500 lb/MMscf	18,900 lb/MMscf
VOC	16,500 lb/MMscf	47,500 lb/MMscf
n-Hexane	200 lb/MMscf	600 lb/MMscf
BTEX, TMP (ea)	20 lb/MMscf	20 lb/MMscf
Total HAP	300 lb/MMscf	700 lb/MMscf

4 - Total Rod Packing Leak Rate (scf/yr) =
No. of Compresors * Cylinders/Compressor * scfh/Cylinder * hr/yr operation * (1 + Contingency)

5 - Engine crankcase emissions are based on vendor data: "As a general rule, blow-by (i.e., crankcase emissions) on a new engine is approx 0.5 scf/bhp-hr." A "safety factor" is used to account for increasing blow-by as the engines "wear".

6 - Crankcase emissions are estimated as follows:

(Data from CAT G3516B Data Sheet and Emissions Calculation Spreadsheet.)

Total Engine Exhaust (TEEx) (Volume)	**9,216 ft3/min (acf/min)**	1,743 MMscf/yr TEEx*
Pollutant	G3516B PTE	Crankcase Emission Factor**
Crankcase THC emissions (Mass)	60.37 tpy THC	69.25 lb THC / MMscf TEEx
Crankcase VOC emissions (Mass)	18.79 tpy VOC	21.55 lb VOC / MMscf TEEx
Crankcase HCHO emissions (Mass)	5.33 tpy HCHO	6.11 lb HCHO / MMscf TEEx
Crankcase n-Hexane emissions (Mass)	0.05 tpy BTEX (ea)	0.06 lb BTEX (ea) / MMscf TEEx
Crankcase BTEX, TMP (ea) emissions (Mas:	0.18 tpy BTEX (ea)	0.21 lb BTEX (ea) / MMscf TEEx
Crankcase HAP emissions (Mass)	6.29 tpy HAP	7.21 lb HAP / MMscf TEEx
Crankcase CO2 emissions (Mass)	6,703 tpy CO2	7,689 lb CO2 / MMscf TEEx
Crankcase CH4 emissions (Mass)	32 tpy CH4	37 lb CH4 / MMscf TEEx
Crankcase CO2e emissions (Mass)	7,502 tpy CO2e	8,606 lb CO2e /MMscf TEEx

* Conversion from acf/min to scf/yr based on 8,760 hr/yr, 1,007 oF exhaust temp, and 68 oF std temp.

** Crankcase Emission Factor = PTE (tpy) from a G3516B Engine ÷ Total Engine Exhaust (TEEx) (MMsfy/yr).

7 - The reciprocating compressor driven by the Caterpillar G3516B engine is expected to operate 8,760 hrs/yr.

8 - The reciprocating compressor driven by the electric motor is expected to operate a maximum of 500 hrs/yr.

Williams Ohio Valley Midstream LLC

FRANCIS COMPRESSOR STATION

Application for 45CSR13 NSR Construction Permit

Attachment N - Supporting Emissions Calculations

Start/Stop/Maintenance (Including Blowdown) (SSM-2/24E)

Unit		No of Units	Total bhp	a. Engine "Cold-Start" Gas Volume scf/Start	b. Blowdown Gas Volume scf/B-D	SSM and Blowdown Events/yr	Total Gas Vented MMscf/yr	VOC 16,500 (Inlet) 47,500 (Flash) lb/MMscf tpy	n-Hex 200 (Inlet) 600 (Flash) lb/MMscf tpy	BTEX,TMP 20 (Inlet) 20 (Flash) lb/MMscf tpy	Total HAP 300 (Inlet) 700 (Flash) lb/MMscf tpy	CH4 36,500 (Inlet) 18,900 (Flash) lb/MMscf tpy	CO2e GWP = 25 tpy
SSM-2/24E	a. Cold Start (Engine)	1	na	700	---	208	0.15	1.20	0.01	1.5E-03	0.02	2.66	66
	b. Blowdown (Recip Comp)	1	1,380	---	8,577	208	1.78	14.72	0.18	0.02	0.27	32.56	814
	b. Blowdown (Recip Comp)	1	55	---	342	12	4.1E-03	0.10	1.2E-03	4.1E-05	1.4E-03	0.04	1
							TOTAL SSM-2/24E:	**16.02**	**0.19**	**0.02**	**0.29**	**35.25**	**881**

Notes: 1 - SSM Emissions are the sum of:

a. Unburned fuel resulting from "cold-start" of idle gas-fired engines; and

b. Natural gas that is purged (aka blowdown) from the compressors and associated piping and equipment.

2 - Starting Gas Quantity and Blowdown (B-D) Gas Quantity as per Engineering Department.

(e.g., 8,577 scf/B-D of a compressor with a 1,380 bhp engine equals 6.22 scf/bhp/B-D.)

Engines	a. Unburned "Cold-Start" Gas is Constant at:	700 scf/start
	b. Blowdown Gas is Related to bhp at:	6.22 scf/bhp/B-D

3 - To be conservative, the following "worst-case" gas characteristics were assumed:

Pollutant	Inlet Gas	Flash Gas
Carbon Dioxide	300.00 lb/MMscf	300.00 lb/MMscf
Methane	36,500.00 lb/MMscf	18,900.00 lb/MMscf
Ethane	4,445.72 lb/MMscf	14,100.06 lb/MMscf
VOC	16,500.00 lb/MMscf	47,500.00 lb/MMscf
Benzene	20.00 lb/MMscf	20.00 lb/MMscf
Ethylbenzene	20.00 lb/MMscf	20.00 lb/MMscf
n-Hexane	200.00 lb/MMscf	600.00 lb/MMscf
Toluene	20.00 lb/MMscf	20.00 lb/MMscf
2,2,4-TMP (i-Octane)	20.00 lb/MMscf	20.00 lb/MMscf
Xylenes	20.00 lb/MMscf	20.00 lb/MMscf
Total HAP	300.00 lb/MMscf	700.00 lb/MMscf

5 - Emission estimates are conservatively based on:

4.0	Starts per week
4.0	Blowdown(s) per week - CAT G3516B Compressor
1.0	Blowdown(s) per month - Motor Driven Compressor

Piping and Equipment Fugitives (FUG-3/25E)

Unit ID	Description	Component (Unit) Type (Gas)	Unit Count	THC Factor lb/hr/Unit	LDAR Control Credit	Hydrocarbons (THC)		VOC 28.30 Wgt%		n-Hexane 0.34 Wgt%		BTEX, TMP-ea 0.03 Wgt%		Total HAP 0.61 Wgt%		CO2 0.51 Wgt%		CH4 62.59 Wgt%		CO2e GWP = 25	
						lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
FUG-3 /25E	Process Piping Fugitives (Gas)	Valves	257	0.00992	87%	0.33	1.45	0.09	0.41	1.1E-03	5.0E-03	1.1E-04	5.0E-04	1.7E-03	0.01	1.7E-03	0.01	0.21	0.91	5	23
		Pump Seals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Other	30	0.01940	0%	0.58	2.55	0.16	0.72	2.0E-03	0.01	2.0E-04	8.7E-04	3.0E-03	0.01	3.0E-03	0.01	0.36	1.60	9	40
		Connectors	737	0.00044	33%	0.22	0.95	0.06	0.27	7.5E-04	3.3E-03	7.5E-05	3.3E-04	1.1E-03	4.9E-03	1.1E-03	4.9E-03	0.14	0.60	3	15
		Flanges	120	0.00086	0%	0.10	0.45	0.03	0.13	3.5E-04	1.5E-03	3.5E-05	1.5E-04	5.3E-04	2.3E-03	5.3E-04	2.3E-03	0.06	0.28	2	7
		Open-ended	14	0.00441	0%	0.06	0.27	0.02	0.08	2.1E-04	9.3E-04	2.1E-05	9.3E-05	3.2E-04	1.4E-03	3.2E-04	1.4E-03	0.04	0.17	1	4
			1,158		Controlled:	1.30	5.68	0.37	1.61	4.4E-03	0.02	4.4E-04	1.9E-03	0.01	0.03	0.01	0.03	0.81	3.55	20	89
					Pre-Control:	3.62	15.86	1.02	4.49	0.01	0.05	1.2E-03	0.01	0.02	0.08	0.02	0.08	2.27	9.93	57	248

Unit ID	Description	Component (Unit) Type (Water/Oil)	Unit Count	THC Factor lb/hr/Unit	LDAR Control Credit	Hydrocarbons (THC)		VOC 100.00 Wgt%		n-Hexane 5.00 Wgt%		BTEX, TMP-ea 1.00 Wgt%		Total HAP 10.00 Wgt%		CO2 0.10 Wgt%		CH4 5.00 Wgt%		CO2e GWP = 25	
						lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
FUG-3 /25E	Process Piping Fugitives (Water/Oil)	Valves	64	0.00022	84%	2.2E-03	0.01	2.2E-03	0.01	1.1E-04	4.9E-04	2.2E-05	9.7E-05	2.2E-04	9.7E-04	2.2E-06	9.7E-06	1.1E-04	4.9E-04	2.8E-03	0.01
		Pump Seals	6	0.00005	69%	9.8E-05	4.3E-04	9.8E-05	4.3E-04	4.9E-06	2.2E-05	9.8E-07	4.3E-06	9.8E-06	4.3E-05	9.8E-08	4.3E-07	4.9E-06	2.2E-05	1.2E-04	5.4E-04
		Other	8	0.03086	0%	0.23	1.01	0.23	1.01	1.2E-02	0.05	2.3E-03	1.0E-02	2.3E-02	0.10	2.3E-04	1.0E-03	0.01	0.05	0.29	1
		Connectors	184	0.00024	33%	0.03	0.13	0.03	0.13	1.5E-03	6.6E-03	3.0E-04	1.3E-03	3.0E-03	1.3E-02	3.0E-05	1.3E-04	1.5E-03	0.01	0.04	0.16
		Flanges	30	0.00001	0%	1.9E-04	8.4E-04	1.9E-04	8.4E-04	9.6E-06	4.2E-05	1.9E-06	8.4E-06	1.9E-05	8.4E-05	1.9E-07	8.4E-07	9.6E-06	4.2E-05	2.4E-04	1.1E-03
		Open-ended	4	0.00055	0%	1.9E-03	0.01	1.9E-03	0.01	9.6E-05	4.2E-04	1.9E-05	8.4E-05	1.9E-04	8.4E-04	1.9E-06	8.4E-06	9.6E-05	4.2E-04	2.4E-03	0.01
			296		Controlled:	0.27	1.16	0.27	1.16	1.3E-02	0.06	2.7E-03	1.2E-02	0.03	0.12	2.7E-04	1.2E-03	0.01	0.06	0.33	1
					Pre-Control:	0.29	1.28	0.29	1.28	0.01	0.06	2.9E-03	0.01	0.03	0.13	2.9E-04	---	0.01	---	---	---

	Hydrocarbons (THC)		VOC		n-Hexane		BTEX, TMP-ea		Total HAP		CO2		CH4		CO2e	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
TOTAL CONTROLLED FUGITIVE EMISSIONS:	1.56	6.84	0.63	2.77	0.02	0.08	3.1E-03	0.01	0.03	0.15	0.01	0.03	1	4	21	90
TOTAL PRE-CONTROL FUGITIVE EMISSIONS:	3.91	17.14	1.32	5.77	0.03	0.12	4.2E-03	0.02	0.05	0.21	0.02	0.08	2	10	57	248

Notes:

1 - Assumed 8,760 hours per year of fugitive emissions.

2 - Emissions calculated using EPA Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, Nov 1995.

TABLE 2.4 O&G PROD (AVG)	Gas		Water/Oil	
	kg/hr	lb/hr	kg/hr	lb/hr
Valves	4.5E-03	0.00992	9.8E-05	0.00022
Pump Seals	na	na	2.4E-05	0.00005
Others*	8.8E-03	0.01940	1.4E-02	0.03086
Connectors	2.0E-04	0.00044	1.1E-04	0.00024
Flanges	3.9E-04	0.00086	2.9E-06	0.00001
Open-Ended Lines	2.0E-03	0.00441	2.5E-04	0.00055

3 - To be conservative, the following gas characteristics were assumed:

Pollutant	Gas	Light Liquid
Carbon Dioxide	0.51 Wgt%	0.10 Wgt%
Methane	62.59 Wgt%	5.00 Wgt%
VOC	28.30 Wgt%	100.00 Wgt%
n-Hexane	0.34 Wgt%	5.00 Wgt%
BTEX, TMP-ea	0.03 Wgt%	1.00 Wgt%
Total HAP	0.51 Wgt%	10.00 Wgt%

4 - Number of components in Gas Service are based on GRI-HAPCalc estimates, plus a 0% margin.

5 - Number of components in Water/Oil Service are based on 25% of components in Gas Service, except pump seals.

6 - "Other" components include compressor seals, relief valves, drains, meters, etc.

7 - The facility has implemented an LDAR Program. Control effectiveness is estimated as follows:

CONTROL EFFECTIVENESS FOR AN LDAR PROGRAM AT A SOCMI PROCESS UNIT

Equipment Type and Service	Control Effectiveness (%)		
	Monthly Monitoring 10,000 ppmv Leak Definition	Quarterly Monitoring 10,000 ppmv Leak Definition	HON[a]
Valves - gas	87	67	92
Valves - light liquid	84	61	88
Pumps - light liquid	69	45	75
Compressors - gas	[b]	[b]	93
Connectors - gas and light liquid	[b]	33	[b]
Pressure relief devices - gas	[b]	44	[b]

[a] Control effectiveness attributed to the requirements of the HON equipment leak regulation is estimated based on equipment-specific leak definitions and performance levels.
[b] Data are not available to estimate control effectiveness.

Potentially Applicable

AP-42 and GHG EMISSION FACTORS

(Preferentially use test data or vendor data where available)

	Pollutant	GAS-FIRED ENGINE AP-42 Table 3.2-1, 3.2-2, 3.2-3 07/00			GAS-FIRED TURBINE AP-42 Table 3.1-1, 3.1-2a, 3.1-3 04/00		
		2SLB lb/MMBtu	4SLB lb/MMBtu	4SRB lb/MMBtu	Uncontrolled lb/MMBtu	Water Injection lb/MMBtu	Lean Pre-Mix# lb/MMBtu
CRITERIA	NOX (≥ 90% Load)	3.17E+00	4.08E+00	2.21E+00	3.20E-01	1.30E-01	9.90E-02
	CO (≥ 90% Load)	3.86E-01	3.17E-01	3.72E+00	8.20E-02	3.00E-02	1.50E-02
	THC (TOC)	1.64E+00	1.47E+00	3.58E-01	1.10E-02	1.10E-02	1.10E-02
	NMHC (THC-CH4)	1.90E-01	2.20E-01	1.28E-01	2.40E-03	2.40E-03	2.40E-03
	NMNEHC (NMHC-C2H6)	1.19E-01	1.15E-01	5.76E-02	2.10E-03	2.10E-03	2.10E-03
	VOC	1.20E-01	1.18E-01	2.96E-02	2.10E-03	2.10E-03	2.10E-03
	SO2*** (2,000 gr-S/MMscf)	5.88E-04	5.88E-04	5.88E-04	3.40E-03	3.40E-03	3.40E-03
	PM10/2.5 (Filter+Cond)	4.83E-02	9.99E-03	1.94E-02	6.60E-03	6.60E-03	6.60E-03
HAPs	Acetaldehyde	7.76E-03	8.36E-03	2.79E-03	4.00E-05	4.00E-05	4.00E-05
	Acrolein	7.78E-03	5.14E-03	2.63E-03	6.40E-06	6.40E-06	6.40E-06
	Benzene	1.94E-03	4.40E-04	1.58E-03	1.20E-05	1.20E-05	9.10E-07
	Ethylbenzene	1.08E-04	3.97E-05	2.48E-05	3.20E-05	3.20E-05	3.20E-05
	Formaldehyde (HCHO)	5.52E-02	5.28E-02	2.05E-02	7.10E-04	7.10E-04	2.00E-05
	n-Hexane	4.45E-04	1.11E-03	—	—	—	—
	Methanol (MeOH)	2.48E-03	2.50E-03	3.06E-03	—	—	—
	Toluene	9.63E-04	4.08E-04	5.58E-04	1.30E-04	1.30E-04	1.30E-04
	TMP, 2,2,4- (i-Octane)	8.46E-04	2.50E-04	—	—	—	—
	Xylenes	2.68E-04	1.84E-04	1.95E-04	6.40E-05	6.40E-05	6.40E-05
	Other HAPs	1.61E-03	9.34E-04	9.39E-04	5.97E-05	5.97E-05	5.97E-05
GHG	CO2**** (GWP=1)	1.17E+02	1.17E+02	1.17E+02	1.17E+02	1.17E+02	1.17E+02
	CH4 (GWP=25)	1.45E+00	1.25E+00	2.30E-01	8.60E-03	8.60E-03	8.60E-03
	N2O (GWP=298)	*2.20E-04*	*2.20E-04*	*2.20E-04*	3.00E-03	3.00E-03	3.00E-03
	CO2e	*1.53E+02*	*1.48E+02*	*1.23E+02*	*1.18E+02*	*1.18E+02*	*1.18E+02*

(#Lean Pre-Mix - aka: Dry Low Emissions (DLE or DLN) and SoLoNOx)

	Pollutant	GAS-FIRED EXTERNAL COMBUSTION AP-42 Table 1.4-1, 1.4-2, 1.4-3 (<100 MMBtu/hr) 07/98			FLARE 13.5-1 04/15	DIESEL ENGINE 3.3-1, 3.3-2 10/96
		Uncontrolled lb/MMBtu	LoNOx Burners lb/MMBtu	Flue Gas Recirc lb/MMBtu	Combustion lb/MMBtu	Uncontrolled lb/MMBtu
CRITERIA	NOX	9.80E-02	4.90E-02	3.14E-02	6.80E-02	4.41E+00
	CO	8.24E-02	8.24E-02	8.24E-02	3.10E-01	9.50E-01
	THC (TOC)	1.08E-02	1.08E-02	1.08E-02	≥98% Destruction and Removal Efficiency	3.60E-01
	NMHC (THC-CH4)	8.53E-03	8.53E-03	8.53E-03		3.53E-01
	NMNEHC (NMHC-C2H6)	5.49E-03	5.49E-03	5.49E-03		3.50E-01
	VOC (NMNEHC+HCHO)	5.56E-03	5.56E-03	5.56E-03		3.60E-01
	SO2 (2,000 gr-S/MMscf)	5.88E-04	5.88E-04	5.88E-04	*5.882E-04*	2.90E-01
	PM10/2.5 (Filter+Condense)	7.45E-03	7.45E-03	7.45E-03	*7.451E-03*	3.10E-01
HAPs	Acetaldehyde	—	—	—	≥98% Destruction and Removal Efficiency	7.67E-04
	Acrolein	—	—	—		9.25E-05
	Benzene	2.06E-06	2.06E-06	2.06E-06		9.33E-04
	Ethylbenzene	—	—	—		—
	HCHO (Formaldehyde)	7.35E-05	7.35E-05	7.35E-05		1.18E-03
	n-Hexane	1.76E-03	1.76E-03	1.76E-03		—
	Methanol (MeOH)	—	—	—		—
	Toluene	3.33E-06	3.33E-06	3.33E-06		4.09E-04
	2,2,4-TMP (i-Octane)	—	—	—		—
	Xylenes	—	—	—		2.85E-04
	Other HAPs	1.86E-06	1.86E-06	1.86E-06		1.05E-03
GHG	CO2 (GWP=1)	1.18E+02	1.18E+02	1.18E+02	*1.18E+02*	1.64E+02
	CH4 (GWP=25)	2.25E-03	2.25E-03	2.25E-03	*98% DRE*	*6.61E-03*
	N2O (GWP=298)	2.16E-03	6.27E-04	6.27E-04	*2.16E-03*	*1.32E-03*
	CO2e	*1.18E+02*	*1.18E+02*	*1.18E+02*	*1.18E+02*	*1.65E+02*

Fuel Type	40 CFR 98 - DEFAULT EMISSION FACTORS Table C-1 to Subpart C of Part 98 Default HHV	Table C-2 to Subpart C of Part 98 Carbon Dioxide lb CO2/MMBtu	Methane lb CH4/MMBtu	Nitrous Oxide lb N2O/MMBtu
Fuel Oil No. 2 (Diesel)	0.138 MMBtu/gal	163.05	6.61E-03	1.32E-03
Propane	0.091 MMBtu/gal	138.60	6.61E-03	1.32E-03
Natural Gas	1,026 Btu/scf	116.98	2.20E-03	2.20E-04

Global Warming Potential (100 Yr) (GWP) Table A-1 to Subpart A of Part 98		
CO2	CH4	N2O
1.00	25.00	298.00

Conversion Factors

http://www.onlineconversion.com/

1.0 lb	=	453.5924 g
1.0 kg	=	2.2046 lb
1.0 hp	=	2,544.433 Btu/hr
1.0 hp	=	745.700 Watt
1.0 kW	=	3,412.142 Btu/hr
1.0 kW-hr	=	1.3400 hp-hr
1.0 cf	=	7.4805 gal
1.0 gal H2O	=	8.3378 lb
1.0 cf H2O	=	62.3711 gal
1.0 m	=	3.2808 ft
1.0 km	=	0.6214 mi
1.0 acre	=	43,560.174 ft2
1.0 °F	=	(°C*9/5)+32
1.0 °R	=	°F+459.67
1.0 %	=	10,000 ppm
UGC (stp)	=	379.48 scf/lb-mol

*Converted Ext Comb Emission Factors to lb/MMBtu by dividing lb/MMscf by AP-42 default HHV of 1,020 Btu/scf.
**Converted GHG Emission Factors to lb/MMBtu by multiplying kg/MMBtu by 2.2046 lb/kg.
***Assumes 100% conversion of fuel sulfur to SO2 (2,000 gr/MMscf).
****Assumes 99.5% conversion of fuel carbon to CO2 for natural gas.

ATTACHMENT O

Monitoring/Recordkeeping/Reporting/Testing Plans

"31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as Attachment O."

- **Monitoring/Recordkeeping/Reporting/Testing Plans**

Attachment O
MONITORING/RECORDKEEPING/REPORTING/TESTING PLANS

Williams Ohio Valley Midstream LLC proposes the following monitoring, recordkeeping, testing and reporting requirements at the subject facility:

A. Monitoring

1. Monitor the quantity of natural gas consumed and hours of operation of the engine.

B. Recordkeeping

1. Maintain records of the amount of natural gas consumed and hours of operation of the engine.
2. Maintain records of testing conducted in accordance with the permit.
3. Maintain a record of all potential to emit (PTE) HAP calculations for the entire facility.
4. The records shall be maintained on site or in a readily available off-site location for a period of five (5) years.

C. Reporting

1. Any deviations from the allowable emissions limitations, including visible emissions, shall be reported to the WVDEP-Division of Air Quality.
2. Any and all application forms, reports, or compliance certifications required by this Permit shall be certified by a responsible official.

D. Testing

1. The Compressor Engine (CE-01/22E) shall be tested in accordance w/ requirements of 40 CFR 60 (NSPS) Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

ATTACHMENT P

Public Notice

"32. **Public Notice**. At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and Example Legal Advertisement for details). Please submit the **Affidavit of Publication** as Attachment P immediately upon receipt."

The applicant shall cause such legal advertisement to appear a minimum of one (1) day in the newspaper most commonly read in the area where the facility exists or will be constructed. The notice must be published no earlier than five (5) working days of receipt by this office of your application. The original affidavit of publication must be received by this office no later than the last day of the public comment period.

The advertisement shall contain, at a minimum, the name of the applicant, the type and location of the source, the type and amount of air pollutants that will be discharged, the nature of the permit being sought, the proposed start-up date for the source and a contact telephone number for more information.

The location of the source should be as specific as possible starting with:

1) the street address of the source;
2) the nearest street or road;
3) the nearest town or unincorporated area;
4) the county; and
5) latitude and longitude coordinates.

Types and amounts of pollutants discharged must include all regulated pollutants (PM, PM10, VOC, SO2, Xylene, etc.) and their potential to emit or the permit level being sought in units of tons per year (including fugitive emissions).

- Legal Advertisement (as shown) will be placed in a newspaper of general circulation in the area where the source is located (See 45CSR§13-8.3 thru 45CSR§13-8.5).
- An Affidavit of Publication shall be submitted immediately upon receipt.

AIR QUALITY PUBLIC NOTICE
Notice of Application

Notice is given that Williams Ohio Valley Midstream LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a 45CSR13 NSR Construction Permit for a natural gas compressor station located at the existing Oak Grove Gas Plant, 5258 Fork Ridge Rd, Moundsville, Marshall County, WV.

The latitude and longitude coordinates are 39.8739 degrees North and -80.6931 degrees West.

The applicant estimates the potential to discharge regulated air pollutants will be as follows:

6.66	tons of nitrogen oxides per year
3.89	tons of carbon monoxide per year
29.48	tons of volatile organic compounds per year
0.03	tons of sulfur dioxide per year
0.49	tons of particulate matter per year
0.05	tons of benzene per year
1.65	tons of formaldehyde per year
0.35	tons of n-hexane per year
2.47	tons of total hazardous air pollutants per year
8,744	tons of carbon dioxide equivalent per year

Startup of the facility is anticipated to occur during the 2nd quarter of 2016.

Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality (DAQ), 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.

Dated this the _____ day of _____ 20_____.

By: Williams Ohio Valley Midstream LLC
Mr. Paul V. Hunter
General Manager Ohio River Supply Hub
Park Place Corporate Center 2
2000 Commerce Drive
Pittsburgh, PA 15275

Note: This is the legal advertisement run in the Moundsville Daily Echo in December 2015. Due to the insignificant emissions increase resulting from revisions to the original permit application submitted on December 22, 2015, the WVDEP has stated an additional public notice is not required.

MOUNDSVILLE DAILY ECHO
SINCE 1891

(304) 845-2660
P.O. BOX 369
MOUNDSVILLE
WEST VIRGINIA
26041

AFFIDAVIT OF PUBLICATION

STATE OF WEST VIRGINIA,
COUNTY OF MARSHALL, to wit

I, Melanie S. Murdock being first duly sworn upon my oath, do depose and say:

- that I am Legal Advertising Manager of the MOUNDSVILLE DAILY ECHO, a Republican newspaper;
- that I have been duly authorized to execute this affidavit;
- that such newspaper has been published for over 119 years, is regularly published afternoons daily except Saturdays and Sundays, for at least fifty weeks during the calendar year, in the municipality of Moundsville, Marshall County, West Virginia.
- that such newspaper is a newspaper of "general circulation" as defined in Art. 3, Chap. 59 of the Code of West Virginia 1931 as amended, within Moundsville and Marshall County;
- that such newspaper averages in length four or more pages, exclusive of any cover, per issue;
- that such newspaper is circulated to the general public at a definite price or consideration;
- that such newspaper is a newspaper to which the general public resorts for passing events of a political, religious, commercial and social nature and for current happenings, announcements, miscellaneous reading matters, advertisements and other notices;
- and that the annexed notice described as follows:

Legal Advertisement

PARTY(ies)

Air Quality Notice / Oak Grove Gas Plant

NATURE (and agency if heard before one)

CERTIF-BILL TO

Erika Baldauff
Williams
100 Teletch Drive, Suite 2
Moundsville, WV 26041

WAS PUBLISHED IN-SAID NEWSPAPER AS FOLLOWS

Times	Dates
1	December 29, 2015

BY WORDS	PUBLICATION CHARGES
369	$42.44

(signed) Melanie S. Murdock

NOTARIZATION

Taken, sworn and subscribed before me this 30th day of December 2015

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
AMY McGLUMPHY
Moundsville Daily Echo
PO Box 369
Moundsville, WV 26041
My Commission Expires August 24, 2022

Notary Public

LEGAL ADVERTISEMENT

AIR QUALITY PUBLIC NOTICE

Notice of Application

Notice is given that Williams Ohio Valley Midstream LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a 45CSR13 NSR Construction Permit for a natural gas compressor station located at the existing Oak Grove Gas Plant, 5258 Fork Ridge Rd, Moundsville, Marshall County, WV.

The latitude and longitude coordinates are 39.8739 degrees North and -80.6931 degrees West.

The applicant estimates the potential to discharge regulated air pollutants will be as follows:

6.66 tons of nitrogen oxides per year

3.89 tons of carbon monoxide per year

29.48 tons of volatile organic compounds per year

0.03 tons of sulfur dioxide per year

0.49 tons of particulate matter per year

0.05 tons of benzene per year

1.65 tons of formaldehyde per year

0.35 tons of n-hexane per year

2.47 tons of total hazardous air pollutants per year

8,744 tons of carbon dioxide equivalent per year

Startup is anticipated in the second quarter of 2016.

Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality (DAQ), 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.

Dated this the 29th day of December 2015.

By: Williams Ohio Valley Midstream LLC

Mr. Paul V. Hunter

General Manager Ohio River Supply Hub

Park Place Corporate Center 2

2000 Commerce Drive

Pittsburgh, PA 15275

PUBLISH: December 29, 2015.

ATTACHMENT Q

Business Confidential Claims

(NOT APPLICABLE)

---

also

ATTACHMENT R

Authority Forms

(NOT APPLICABLE)

ATTACHMENT S

Title V Permit Revision Information

The OVM Francis Compressor Station will be located at the existing OVM Oak Grove Gas Plant. It is requested the Oak Grove Gas Plant Title V permit is updated to include the Francis Compressor Station 45CSR13 permit requirements.

Attachment S

Title V Permit Revision Information

1. New Applicable Requirements Summary	
Mark all applicable requirements associated with the changes involved with this permit revision:	
☐ SIP	☐ FIP
☒ Minor source NSR (45CSR13)	☐ PSD (45CSR14)
☐ NESHAP (45CSR15)	☐ Nonattainment NSR (45CSR19)
☒ Section 111 NSPS (Subpart(s) JJJJ and OOOO)	☒ Section 112(d) MACT standards (Subpart(s) ZZZZ)
☐ Section 112(g) Case-by-case MACT	☐ 112(r) RMP
☐ Section 112(i) Early reduction of HAP	☐ Consumer/commercial prod. reqts., section 183(e)
☐ Section 129 Standards/Reqts.	☐ Stratospheric ozone (Title VI)
☐ Tank vessel reqt., section 183(f)	☐ Emissions cap 45CSR§30-2.6.1
☐ NAAQS, increments or visibility (temp. sources)	☐ 45CSR27 State enforceable only rule
☐ 45CSR4 State enforceable only rule	☐ Acid Rain (Title IV, 45CSR33)
☐ Emissions Trading and Banking (45CSR28)	☐ Compliance Assurance Monitoring (40CFR64) [1]
☐ NO_x Budget Trading Program Non-EGUs (45CSR1)	☐ NO_x Budget Trading Program EGUs (45CSR26)
[1] If this box is checked, please include **Compliance Assurance Monitoring (CAM) Form(s)** for each Pollutants Specific Emission Unit (PSEU) (See Attachment H to Title V Application). If this box is not checked, please explain why **Compliance Assurance Monitoring** is not applicable:	

2. Non Applicability Determinations

List all requirements, which the source has determined not applicable to this permit revision and for which a permit shield is requested. The listing shall also include the rule citation and a rationale for the determination.

NEW SOURCE PERFORMANCE STANDARDS (NSPS)

NSPS D - No boiler greater than 250 MMBtu/hr (40CFR60.40(a)(1))
NSPS Da - No boiler greater than 250 MMBtu/hr (40CFR60.40a(a)(1))
NSPS Db - No boiler greater than 100 MMBtu/hr (40CFR60.40b(a))
NSPS K - No tank greater than 40,000 gallons (40CFR 60.110(a))
NSPS Ka - No tank greater than 151.416 m3 (40,000 gal) (40CFR60.110a(a))
NSPS Kb - No tank greater than 75 m3 (19,815 gal) (40CFR60.110b(a))
NSPS GG - No stationary gas turbine (40CFR60.330(a))
NSPS KKK - Plant construction commenced after 08/23/11 (40CFR60.630(b))
NSPS LLL - No sweetening units on site (40CFR60.640(a))
NSPS IIII - No stationary compression ignition engine (§60.4200(a))
NSPS KKKK - No stationary combustion turbine (§60.4300(a))

NATIONAL EMISSION STANDARDS FOR HAZAROUS AIR POLLUTANTS (NESHAP)

NESHAP HH - Not a major source of HAP and no TEG dehydration unit (§63.760(b)(2))
NESHAP HHH - No natural gas transmission or storage prior to local distribution (§63.1270(a))
NESHAP YYYY - No stationary gas turbine (§63.6080(a))
NESHAP DDDDD - Not a major source of HAP (§63.7485(a))
NESHAP JJJJJJ - No boiler as defined (§63.11195(e))

COMPLIANCE ASSURANCE MONITORING (CAM)

CAM - This rule does not apply because there no pollutant specific emission units subject to an emissions limitation or standard that require a control device be used to achieve compliance. (§64.2a))

WEST VIRGINIA AIR QUALITY REGULATIONS

45CSR14 - Not a PSD major source or PSD major modification
45CSR19 - Not located in a non-attainment area for NOx, CO, or VOC
45CSR21 - Control of VOCs - Not located in Putnam, Kanawha, Cabell, Wayne, or Wood County
45CSR27 - Exempt because equipment is used in the production and distribution of petroleum products
45CSR28 - Voluntary Emission Trading Program - Applicant chooses not to participate
45CSR29 - Not in Putnam, Kanawha, Cabell, Wayne, or Wood County
45CSR34 - Not a major source of HAP or otherwise subject to NESHAP requirements

☐ **Permit Shield Requested** *(not applicable to Minor Modifications)*

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

3. Suggested Title V Draft Permit Language

Are there any changes involved with this Title V Permit revision outside of the scope of the NSR Permit revision? ☐ Yes ☒ No If Yes, describe the changes below.

Also, please provide **Suggested Title V Draft Permit language** for the proposed Title V Permit revision (including all applicable requirements associated with the permit revision and any associated monitoring /recordkeeping/ reporting requirements), OR attach a marked up pages of current Title V Permit. Please include appropriate citations (Permit or Consent Order number, condition number and/or rule citation (e.g. 45CSR§7-4.1)) for those requirements being added / revised.

4. Active NSR Permits/Permit Determinations/Consent Orders Associated With This Permit Revision

Permit or Consent Order Number	Date of Issuance	Permit/Consent Order Condition Number
R13-3070	07/12/2013	PD14-044
R13-3070A	01/05/2016	
	/ /	

5. Inactive NSR Permits/Obsolete Permit or Consent Orders Conditions Associated With This Revision

Permit or Consent Order Number	Date of Issuance	Permit/Consent Order Condition Number
	/ /	
	/ /	
	/ /	

6. Change in Potential Emissions

Pollutant	Change in Potential Emissions (+ or -), TPY
Nitrogen Oxides (NOx)	+6.66
Carbon Monoxide (CO)	+3.89
Volatile Organic Compounds (VOC)	+30.19
Sulfur Dioxide (SO2)	+0.03
Particulate Matter (PM)	+0.49
Formaldehyde (HCHO)	+1.65
Total Hazardous Air Pollutants (HAPs)	+2.48

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

35A. Certification of Information. To certify this permit application, a Responsible Official (45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☒ **Responsible Official** / ☐ **Authorized Representative,** hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE: Paul V. Hunter *(Please use blue ink)* DATE: 03/03/2016 *(Please use blue ink)*

35B. Printed name of signee: **PAUL V. HUNTER**	35C. Title: **GENERAL MANAGER OHIO RIVER SUPPLY HUB**	
35D. E-mail: **PAULV.HUNTER @WILLIAMS.COM**	36E. Phone: **(412) 787-5561**	36F. FAX: **(412) 787-6002**
36A. Printed name of contact person: **ERIKA BALDAUFF**	36B. Title: **ENVIRONMENTAL SPECIALIST**	
36C. E-mail: **ERIKA.BALDAUFF@WILLIAMS.COM**	36D. Phone: **(304) 843-4559**	36E. FAX: **(304) 843-3196**

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

- ☒ **Attachment A: Business Certificate**
- ☒ **Attachment B: Map(s)**
- ☒ **Attachment C: Installation and Start Up Schedule**
- ☒ **Attachment D: Regulatory Discussion**
- ☒ **Attachment E: Plot Plan**
- ☒ **Attachment F: Detailed Process Flow Diagram(s)**
- ☒ **Attachment G: Process Description**
- ☒ **Attachment H: Material Safety Data Sheets (MSDS)**
- ☒ **Attachment I: Emission Units Table**
- ☒ **Attachment J: Emission Points Data Summary Sheet**
- ☒ **Attachment K: Fugitive Emissions Data Summary Sheet**
- ☒ **Attachment L: Emissions Unit Data Sheet(s)**
- ☒ **Attachment M: Air Pollution Control Device Sheet(s)**
- ☒ **Attachment N: Supporting Emissions Calculations**
- ☒ **Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans**
- ☒ **Attachment P: Public Notice**
- ☐ **Attachment Q: Business Confidential Claims (NA)**
- ☐ **Attachment R: Authority Forms (NA)**
- ☒ **Attachment S: Title V Permit Revision information**
- ☒ **Application Fee**

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

- ☐ ***Forward 1 copy of the application to the Title V Permitting Group and***
- ☐ ***For Title V Administrative Amendments:***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit***
- ☐ ***For Title V Minor Modifications:***
  - ☐ ***Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit.***
- ☐ ***For Title V Significant Modifications processed in parallel with NSR Permit revision:***
  - ☐ ***NSR permit writer should notify a Title V permit writer of draft permit,***
  - ☐ ***Public notice should reference both 45CSR13 and Title V permits,***
  - ☐ ***EPA has 45 day review period of a draft permit.***

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

APPLICATION FEE

Include a check payable to WVDEP – Division of Air Quality.

- As per WV Rule 22 (45CSR22) filed on May 6, 1991, a **minimum fee of $1,000** must be submitted for each 45CSR13 permit application filed with the WVDEP-DAQ.
- **Additional charges** may apply, depending on the nature of the application as outlined in Section 3.4.b. of Regulation 22, and shown below:

○ **NSPS Requirements:**	**$1,000**	**JJJJ-Compressor Engine (CE-01/22E) and OOOO-LDAR (FUG-3/25E)**
○ NESHAP Requirements:	$2,500	Not Applicable
○ New Major Source:	$10,000	Not Applicable
○ Major Modifications:	$5,000	Not Applicable

- Total application fee is **$2,000** [= $1,000 minimum fee + $1,000 additional charges]

After printing this label:

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

******* End of Application for 45CSR13 NSR Construction Permit ******

Kessler, Joseph R

From: Kessler, Joseph R
Sent: Thursday, January 21, 2016 11:19 AM
To: 'paulv.hunter@williams.com'
Cc: 'Baldauff, Erika'
Subject: R13-3289 Williams Ohio Valley Midstream LLC Permit Application Status

RE: Application Status: Complete
Williams Ohio Valley Midstream LLC
Francis Compressor Station (Oak Grove Gas Plant)
Permit Application: R13-3289
Plant ID No.: 051-00157

Mr. Hunter,

Your application for a construction permit was received by the Division of Air Quality (DAQ) on December 23, 2015 and assigned to the writer for review. Upon an initial review, the application has been deemed complete as of the date of this e-mail. The ninety (90) day statutory time frame began on this day.

This determination of completeness shall not relieve the permit applicant of the requirement to subsequently submit, in a timely manner, any additional or corrected information deemed necessary for a final permit determination.

Should you have any questions, please contact me at (304) 926-0499 ext. 1219 or reply to this email.

Thank You,

Joe Kessler, PE
Engineer
West Virginia Division of Air Quality
601-57th St., SE
Charleston, WV 25304
Phone: (304) 926-0499 x1219
Fax: (304) 926-0478
Joseph.r.kessler@wv.gov

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

October 23, 2015

CERTIFIED MAIL
91 7199 9991 7034 5495 7786

Don Wicburg, VP Northeast OA
Williams Ohio Valley Midstream LLC
100 Teletech Drive, Suite 2
Moundsville, WV 26041

Re: Delegation of Authority Confirmation

Dear Mr. Wicburg:

The Division of Air Quality hereby acknowledges your Authority of Corporation letter, dated October 21, 2015, for Paul Hunter to be a delegated authorized representative for Williams Ohio Valley Midstream LLC.

Should you have any questions or comments, please feel free to contact our office at the address or telephone number listed above.

Sincerely,

William F. Durham
Director

WFD/jlr

c: Paul Hunter
File Room

Kessler, Joseph R

From: Ward, Beth A
Sent: Wednesday, December 30, 2015 2:08 PM
To: Kessler, Joseph R
Subject: WILLIAMS OHIO VALLEY MIDSTREAM LLC PERMIT APPLICATION FEE

This is the receipt for payment received from:

WILLIAMS OHIO VALLEY MIDSTREAM LLC, OAK GROVE PLANT, CHECK NUMBER 4000129515, CHECK DATE 12/17/2015, $2000.00
R13-3070B ID# 051-00157

OASIS Deposit CR 1600071021

Thank You!

Beth Ward

WV DEPARTMENT OF ENVIRONMENTAL PROTECTION
BTO FISCAL
601 57TH STREET SE
CHARLESTON, WV 25304
(304) 926-0499 EXT 1846
beth.a.ward@wv.gov

UC Defaulted Accounts Search Results

Sorry, no records matching your criteria were found.

FEIN:
Business name: WILLIAMS OHIO VALLEY MIDSTREAM LLC
Doing business as/Trading as:

Please use your browsers back button to try again.

WorkforceWV	Unemployment Compensation	Offices of the Insurance Commissioner

UC Defaulted Accounts Search Results

Sorry, no records matching your criteria were found.

FEIN: 270856707
Business name:
Doing business as/Trading as:

Please use your browsers back button to try again.

WorkforceWV	Unemployment Compensation	Offices of the Insurance Commissioner

Williams Ohio Valley Midstream LLC
100 Teletech Drive, Suite 2
Moundsville, WV 26041
(304) 843-4559
(304) 843-3196 fax

December 30, 2015
(Via Federal Express)

Beverly McKeone
New Source Review Program Manager
Division of Air Quality
West Virginia Department of Environmental Protection
601 57th Street SE
Charleston, WV 25304-2345

Subject: Affidavit of Publication for the Application for 45CSR13 NSR Construction Permit
Williams Ohio Valley Midstream LLC FRANCIS COMPRESSOR STATION
Moundsville, Marshall County, West Virginia

Dear Ms. McKeone,

Williams Ohio Valley Midstream LLC (OVM) submitted a permit application on December 22, 2015, for the Francis Compressor Station. On December 29, 2015, the associated Class I legal advertisement was published in the Moundsville Daily Echo newspaper. Please find attached the original affidavit for the Class I legal advertisement.

If you have any questions concerning this submittal or need additional information, please contact me by telephone at (304) 843-4559 or by e-mail at Erika.Baldauff@Williams.com.

Sincerely,

Erika Baldauff

Erika Baldauff
Environmental Specialist

Enclosure:
Affidavit for Class I Legal Advertisement

Entire Document
NON-CONFIDENTIAL

I.D. No. 051-00157 Reg. 3289
Company OVM
Facility FRANCIS (OAK GROVE) Region
Initials

MOUNDSVILLE DAILY ECHO
SINCE 1891

(304) 845-2660
P.O. BOX 369
MOUNDSVILLE
WEST VIRGINIA
26041

DEC 31 2015

AFFIDAVIT OF PUBLICATION

STATE OF WEST VIRGINIA,
COUNTY OF MARSHALL, to wit

I, Melanie S. Murdock being first duly sworn upon my oath, do depose and say:

- that I am Legal Advertising Manager of the MOUNDSVILLE DAILY ECHO, a Republican newspaper;
- that I have been duly authorized to execute this affidavit;
- that such newspaper has been published for over 119 years, is regularly published afternoons daily except Saturdays and Sundays, for at least fifty weeks during the calendar year, in the municipality of Moundsville, Marshall County, West Virginia.
- that such newspaper is a newspaper of "general circulation" as defined in Art. 3, Chap. 59 of the Code of West Virginia 1931 as amended, within Moundsville and Marshall County;
- that such newspaper averages in length four or more pages, exclusive of any cover, per issue;
- that such newspaper is circulated to the general public at a definite price or consideration;
- that such newspaper is a newspaper to which the general public resorts for passing events of a political, religious, commercial and social nature and for current happenings, announcements, miscellaneous reading matters, advertisements and other notices;
- and that the annexed notice described as follows:

Legal Advertisement

PARTY(ies)

Air Quality Notice / Oak Grove Gas Plant

NATURE (and agency if heard before one)

CERTIF-BILL TO

Erika Baldauff
Williams
100 Teletch Drive, Suite 2
Moundsville, WV 26041

WAS PUBLISHED IN-SAID NEWSPAPER AS FOLLOWS

Times	Dates
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BY WORDS	PUBLICATION CHARGES
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(signed) Melanie S. Murdock

NOTARIZATION

Taken, sworn and subscribed before me this 30th day of December 2015

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
AMY McCLIMPHY
Moundsville Daily Echo
PO Box 369
Moundsville, WV 26041
My Commission Expires August 29, 2023

Amy McClimphy
Notary Public

LEGAL ADVERTISEMENT

AIR QUALITY PUBLIC NOTICE
Notice of Application

Notice is given that Williams Ohio Valley Midstream LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a 45CSR13 NSR Construction Permit for a natural gas compressor station located at the existing Oak Grove Gas Plant, 5258 Fork Ridge Rd, Moundsville, Marshall County, WV.

The latitude and longitude coordinates are 39.8739 degrees North and -80.6931 degrees West.

The applicant estimates the potential to discharge regulated air pollutants will be as follows:

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1.65 tons of formaldehyde per year

0.35 tons of n-hexane per year

2.47 tons of total hazardous air pollutants per year

8,744 tons of carbon dioxide equivalent per year

Startup is anticipated in the second quarter of 2016.

Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality (DAQ), 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.

Dated this the 29th day of December 2015.

By: Williams Ohio Valley Midstream LLC
Mr. Paul V. Hunter
General Manager Ohio River Supply Hub
Park Place Corporate Center 2
2000 Commerce Drive
Pittsburgh, PA 15275
PUBLISH: December 29, 2015.

Adkins, Sandra K

From:	Adkins, Sandra K
Sent:	Tuesday, December 29, 2015 1:02 PM
To:	'paul.hunter@williams.com'; 'erika.baldauff@williams.com'
Cc:	McKeone, Beverly D; Kessler, Joseph R
Subject:	WV DAQ Permit Application Status for Williams Ohio Valley Midstream LLC; Oak Grove Plant

RE: Application Status
Williams Ohio Valley Midstream LLC
Oak Grove Plant
Plant ID No. 051-00157
Application No. R13-3070B

Entire Document
NON-CONFIDENTIAL

Mr. Hunter,

Your application for a modification permit for the Oak Grove Plant was received by this Division on December 23, 2015, and was assigned to Joe Kessler. The following item was not included in the initial application submittal:

Original affidavit for Class I legal advertisement not submitted.

This item is necessary for the assigned permit writer to continue the 30-day completeness review.

Within 30 days, you should receive a letter from Joe stating the status of the permit application and, if complete, given an estimated time frame for the agency's final action on the permit.

Any determination of completeness shall not relieve the permit applicant of the requirement to subsequently submit, in a timely manner, any additional or corrected information deemed necessary for a final permit decision.

Should you have any questions, please contact the assigned engineer, Joe Kessler, at 304-926-0499, extension 1219.