

# FILE INDEX

**Applicant :** Williams Ohio Valley Midstream  
**Facility :** Oak Grove Natural Gas Processing Facility

**Plant ID No.:** 051-00157  
R13-3070A

Chronological Order - Add Index Pages As Necessary

Date	To	From	Subject	# of pages
1/13/15	WVDEP	OVM	Permit Application	
1/15/15	OVM	Jennifer Rice	48-Hour Letter	
1/30/15	Ed Andrews	OVM	Affidavit of Publication	
4/13/15	OVM	Ed Andrews	Incompleteness Letter	
5/05/15	Ed Andrews	OVM	Additional Information	
7/01/15	Joe Kessler	OVM	Zeeco Flare DRE guarantee Letter (via e-mail)	
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	File	Joe Kessler	Public Notice Documents	

JRK  
12/01/2015

# AIR QUALITY PERMIT NOTICE

## Notice of Intent to Approve

On January 13, 2015, Williams Ohio Valley Midstream, LLC applied to the WV Department of Environmental Protection, Division of Air Quality (DAQ) for a permit to modify 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 modification. The DAQ is providing notice to the public of its preliminary determination to issue the permit as R13-3070A.

The following changes in potential emissions will be authorized by this permit action: Particulate Matter less than 2.5 microns, 5.11 tons per year (TPY); Particulate Matter less than 10 microns, 5.11 TPY; Particulate Matter, 5.11 TPY; Sulfur Dioxide, 0.31 TPY; Oxides of Nitrogen, 79.62 TPY; Carbon Monoxide, 120.39 TPY; Volatile Organic Compounds, 39.97 TPY; Hazardous Air Pollutants, -1.82 TPY.

Written comments or requests for a public meeting must be received by the DAQ before 5:00 p.m. on **XXXXXX**. 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 modification 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  
Engineer  
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

*Entire Document*  
**NON-CONFIDENTIAL**

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](http://www.dep.wv.gov/daq/Pages/NSRPermitsforReview.aspx)

I.D. No. 051-00157 Reg. 3070A  
Company WILLIAMS OVM  
Facility OAK GROVE Region         
Initials JK

**Kessler, Joseph R**

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**From:** Adkins, Sandra K  
**Sent:** Tuesday, December 01, 2015 2:19 PM  
**To:** Wheeler, Cathy L  
**Cc:** Kessler, Joseph R  
**Subject:** DAQ Public Notice

Please see below the Public Notice for Draft Permit R13-3070A for Williams Ohio Valley Midstream LLC's Oak Grove Natural Gas Processing Facility located in Marshall County.

The notice will be published in the *Moundsville Daily Echo* on Thursday, December 3, 2015, and the thirty day public comment period will end on Monday, January 4, 2016.

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On January 13, 2015, Williams Ohio Valley Midstream, LLC applied to the WV Department of Environmental Protection, Division of Air Quality (DAQ) for a permit to modify 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 modification. The DAQ is providing notice to the public of its preliminary determination to issue the permit as R13-3070A.

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I.D. No. \_\_\_\_\_ Reg. \_\_\_\_\_  
Company \_\_\_\_\_  
Facility \_\_\_\_\_ Region \_\_\_\_\_  
Initials \_\_\_\_\_

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## Kessler, Joseph R

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**From:** Adkins, Sandra K  
**Sent:** Tuesday, December 01, 2015 9:57 AM  
**To:** wentworth.paul@epa.gov; bradley.megan@epa.gov; danell.zawaski@williams.com  
**Cc:** Durham, William F; McKeone, Beverly D; McCumbers, Carrie; Hammonds, Stephanie E; Rice, Jennifer L; Kessler, Joseph R; Taylor, Danielle R; SeEVERS, Sharon M  
**Subject:** WV Draft Permit R13-3070A for Williams OVM LLC; Oak Grove Natural Gas Processing Facility  
**Attachments:** 3070A.pdf; Eval3070A.pdf; AttachmentA.pdf; notice.pdf

Please find attached the Draft Permit R13-3070A, Engineering Evaluation, Attachment A, and Public Notice for Williams Ohio Valley Midstream LLC's Oak Grove Natural Gas Processing Facility located in Marshall County.

The notice will be published in the *Moundsville Daily Echo* on Thursday, December 2, 2015, and the thirty day public comment period will end on Monday, January 4, 2016.

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

**Kessler, Joseph R**

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**From:** Adkins, Sandra K  
**Sent:** Tuesday, December 01, 2015 9:47 AM  
**To:** Charles Walton  
**Cc:** Kessler, Joseph R  
**Subject:** FW: Publication of Class I Legal Ad for the WV Division of Air Quality

Thank you!

**From:** Charles Walton [<mailto:mdsvecho@gmail.com>]  
**Sent:** Tuesday, December 01, 2015 9:19 AM  
**To:** Adkins, Sandra K <[Sandra.K.Adkins@wv.gov](mailto:Sandra.K.Adkins@wv.gov)>  
**Subject:** Re: Publication of Class I Legal Ad for the WV Division of Air Quality

received and will publish on date requested.  
Melanie

On Tue, Dec 1, 2015 at 9:11 AM, Adkins, Sandra K <[Sandra.K.Adkins@wv.gov](mailto:Sandra.K.Adkins@wv.gov)> wrote:

Please publish the information below as a Class I legal advertisement (one time only) in the Thursday, December 3, 2015, 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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Joe Kessler, PE

Engineer

WV Department of Environmental Protection

Division of Air Quality

601 57th Street, SE

Charleston, WV 25304

Telephone: [304/926-0499](tel:3049260499), ext. 1219

FAX: [304/926-0478](tel:3049260478)

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**Kessler, Joseph R**

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**From:** Adkins, Sandra K  
**Sent:** Tuesday, December 01, 2015 9:12 AM  
**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 Thursday, December 3, 2015, 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**

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DIVISION OF AIR QUALITY**

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**west virginia department of environmental protection**

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

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

## **ENGINEERING EVALUATION/FACT SHEET**

### **BACKGROUND INFORMATION**

Application No.: R13-3070A  
Plant ID No.: 051-00157  
Applicant: Williams Ohio Valley Midstream, LLC  
Facility Name: Oak Grove Natural Gas Processing Facility  
Location: Marshall County  
SIC/NAICS Code: 1321/211112  
Application Type: Modification  
Received Date: January 13, 2015  
Engineer Assigned: Joe Kessler (Reassigned June 15, 2015)  
Fee Amount: \$2,000  
Date Received: February 2, 2015  
Complete Date: November 19, 2015  
Due Date: February 17, 2015  
Applicant Ad Date: January 15, 2015  
Newspaper: *Moundsville Daily Echo*  
UTM's: 525.9 km Easting; 4,414.1 km Northing; Zone 17  
Latitude/Longitude: 39.87580/-80.69590  
Description: Modification to make various changes at the facility including (1) increasing the amount of waste-gases combusted at the flare, (2) revising the maximum design heat input (MDHI) of the Hot Oil and Regeneration Heaters, (3) changing the size and model of the standby generator, and (4) increasing the amount of condensate/slop oil stored and loaded out of the facility.

*Entire Document*  
**NON-CONFIDENTIAL**

On July 12, 2013, Permit Number R13-3070 was issued to Williams Ohio Valley Midstream, LLC (OVM) for the construction and operation of the Oak Grove Gas Plant. The plant was constructed to receive natural gas from upstream production wells and, using three cryogenic process trains, remove ethane, propane, and natural gas liquids (NGLs) from the gas. The facility is co-located with OVM's Independence Compressor Station that utilizes three (3) electric compressor engines. This compressor station - reviewed and granted a "no permit needed" determination under PD15-057 - is considered one-source with the Oak Grove Facility. The only emissions associated with this facility are fugitive emissions from equipment leaks.

## DESCRIPTION OF PROCESS/MODIFICATIONS

### *Existing Facility*

OVM's existing Oak Grove Gas Plant is designed to process 600 million standard cubic feet per day (mmscfd) of incoming natural gas and, using three cryogenic process trains (TXP-1, TXP-2, and TXP-3), remove ethane, propane, and natural gas liquids (NGLs) from the gas leaving "residue gas" to be used either fuel on-site or sent via a pipeline as sales gas.

Incoming untreated gas (up to come 600 mmscfd) from upstream gas wells is sent through the Pig Receivers, Inlet Slug Catcher, Inlet Filtration, and Mole Sieve Dehydrators to remove water, condensate, and other impurities to prepare the gas for introduction into the three cryogenic process trains. Raw condensate removed in the Inlet Slug Catchers is sent to the Stabilizer where it is heated using two Hot Oil Heaters (H-05 and H-06). The heat is used to drive off the lighter end hydrocarbons (methane, ethane, and propane) from the condensate. These light hydrocarbons are then sent back to the inlet gas stream for dewatering in the Mole Sieve Dehydrators. The processed condensate is combined with other collected NGLs for offsite shipment via pipeline. The three Regeneration Gas Heaters (H-02, H-03, and H-04) are used to provide heat in the Dehydrators.

Cleaned and dehydrated gas is then sent to one of three cryogenic process trains to remove ethane, propane, and heavier NGLs from the gas. The cryogenic process drops the temperature of the inlet gas to approximately -120° F. Then an expansion turbine is used to rapidly expand the chilled gases, causing the temperature to drop even further. This rapid temperature drop condenses out much of the ethane and most of the other hydrocarbons (primarily propane and butane) with small amounts of hexane, benzene, toluene, ethylbenzene, xylenes, and methane maintaining in gaseous form. As this is a totally closed system, the only emissions are fugitives from piping and equipment. The cleaned "residue gas" (primarily methane) is then sent either to be used as on-site fuel or sent to a pipeline as salable gas. Any removed liquids from the cryogenic trains is sent to one of the facility's storage tanks. The Hot Oil Heater (H-01) is used in the cryogenic trains to provide process heat.

The gases removed in the cryogenic trains are sent to the de-ethanizer where ethane is removed from the gases and then sent to the Amine Process (V-01) to remove carbon dioxide. The cleaned ethane stream is either sent to the ethane pipeline for off-site distribution or sent to the flare for destruction. The remaining hydrocarbons are condensed and combined with other NGLs for offsite shipment via pipeline.

The facility utilizes a 208,000 lb/hr Zeeco Model Number AFTA-24/80 Process Flare (5S) to combust hydrocarbons from natural gas and NGL during routine depressurization of portions of the plant for maintenance purposes. In addition, it combusts excess ethane that is not transported via the ethane pipeline.

Various storage tanks are located at the facility, but OVM has only identified four (4) that do not fall under the definition of *de minimis* under 45CSR13. These 16,800 gallon tanks currently are used to store facility wastewater (TK-1 and TK-2) and slop oil/condensate (TK-3 and TK-4).

## ***Proposed Modifications***

OVM is now proposing to modify the existing facility by:

- Revising the MDHI of the existing heaters to account for the incorrect calculation of the heat input at the lower “heater duty rate” rather than at MDHI in the original permit application;
- Recalculating annual emissions from all heaters at 8,760 hours per year;
- Increasing the amount of annual permitted waste gases sent to the flare (5S) from 85.50 mmscf/yr to 630.00 mmscf/yr;
- Changing the standby generator to a 224 horsepower (hp), Olympian Model G150LG2, liquid propane gas (LPG)-fired reciprocating engine;
- Revising the emissions from the Amine System;
- Revising the throughputs and contents of the existing storage tanks;
- Increasing the capacity of the product loadout terminal from 1,084,000 gal/year to 4,000,000 gal/year; and
- Making various revisions to the calculation of facility-wide fugitive emissions.

## **SITE INSPECTION**

Due to the nature of the source and the proposed changes, the writer deemed a site inspection as not necessary. The facility was last “Part Of Site” inspected by DAQ Compliance/ Enforcement (C/E) Inspector James Jarrett on May 14, 2015. Based on that inspection, the facility was determined to be “Status 10 - Out of Compliance.” It was during this inspection that it was discovered that OVM was combusting ethane at the flare outside the scope of Permit Number R13-3070.

## **AIR EMISSIONS AND CALCULATION METHODOLOGIES**

OVM included in Attachment N of the permit application detailed facility-wide emissions calculations (revised based on the proposed modifications noted above). The following will only summarize the air emissions and calculation methodologies of the emission sources being modified as part of this permitting action.

### ***Flare Products of Combustion***

Two sources of air emissions occur at the Flare (5E): VOC/HAP emissions that pass-through the flare uncombusted and the products of combusting the organic vapors sent to the flare for destruction. This section details the products of combustion generated at the flare. Emissions (CO and NO<sub>x</sub>) from the products of combustion are primarily based on emission factors as given in Texas

Commission on Environmental Quality's (TCEQ) "Flares and Vapor Oxidizers" Report (RG-109: pp. 19). These emission factors are generally accepted for estimating products of combustion from flares at oil and gas processing facilities when combusting high BTU gas streams. Additional emissions (particulate matter, SO<sub>2</sub>, formaldehyde, and total HAPs) were based on emission factors given under AP-42 Section 1.4 (AP-42 is a database of emission factors maintained by USEPA). While Section 1.4 of AP-42 is used for estimating emissions from boilers combusting natural gas, in the absence of other factors, it is used to conservatively estimate the nominal amounts of expected emissions from various pollutants from flare combustion.

Hourly emissions from the flare were based on the maximum capacity of the flare of 4,624.00 mmBtu/hr. Annual emissions were based on the calculated maximum annual HHV of the gases sent to the flare: 1,061,889 mmBtu/yr. Each calculated heat rate sent to the flare is based on the expected gas volume and heat content of the various waste gas streams sent to the flare for control. An average heat content of the waste gases (HHV) of 1,802 Btu/scf (peak hourly) and 1,685 Btu/scf (average annual) were used in the calculations.

The following table details the emissions factors and revised post-modification potential-to-emit (PTE) of the products of combustion from the flare:

**Table 1: Flaring Combustion Exhaust PTE**

Pollutant	Emission Factor	Source	Hourly (lb/hr)	Annual (ton/yr)
CO	0.2755 lb/MMBtu <sup>(1)</sup>	TCEQ RG-109 (High Btu)	1,273.91	146.28
NO <sub>x</sub>	0.1380 lb/MMBtu <sup>(1)</sup>	TCEQ RG-109 (High Btu)	638.11	73.27
PM <sub>2.5</sub> <sup>(2)</sup>	7.6 lb/10 <sup>6</sup> lb/scf	AP-42, Table 1.4-2	19.50	2.39
PM <sub>10</sub> <sup>(2)</sup>	7.6 lb/10 <sup>6</sup> lb/scf	AP-42, Table 1.4-2	19.50	2.39
PM <sup>(2)</sup>	7.6 lb/10 <sup>6</sup> lb/scf	AP-42, Table 1.4-2	19.50	2.39
SO <sub>2</sub>	0.60 lb/10 <sup>6</sup> lb/scf	AP-42, Table 1.4-2	1.54	0.19

- (1) Emission factors from TCEQ RG-109 (pp. 19) for combustion of high Btu gas streams at non-steam assist flares. OVM flare is an air-assisted flare and combusting waste gas stream with average annual heat content of 1,685 Btu.
- (2) Includes condensables. However, as a smokeless flare, any particulate matter emissions under normal operations should be nominal but OVM included particulate matter emissions to be conservative.

### ***Pass-Through Emissions at the Flare***

Organic vapors are captured from various equipment and processes (and during various short-term scenarios) and sent to the flare for control during non-emergency operation. This includes both continuous streams and intermittent streams. OVM included in their emissions calculations an estimate of the maximum amount and characteristics of the streams sent to the flare from each piece of equipment, process, or event (it was from this data the values used to calculate the combustion exhaust emissions above was determined). From this data (supplied in Attachment H of the permit application), OVM calculated the total annual uncontrolled VOCs and speciated HAPs sent to the flare for destruction (630.19 mmscf/yr) and the average amount of each pollutant per mmscf.

Controlled emissions were then based on the flare achieving a DRE of 99.0%. A DRE of 99.0% was reviewed and permitted for the original flare permitted under R13-3070. During the review of this permitting action, OVM supplied a letter from Zeeco - the manufacturer of the flare - that they guarantee a DRE of 99% from the OVM flare when operated within the guidelines given in the Zeeco Operating Manual.

Hourly emissions from the flare were based on the maximum capacity of the flare of 4,624.00 mmBtu/hr. Annual emissions were based on the calculated maximum annual HHV of the gases sent to the flare: 1,061,889 mmBtu/yr. Each calculated heat rate sent to the flare is based on the expected gas volume and heat content of the various waste gas streams sent to the flare for control. An average heat content of the waste gases (HHV) of 1,802 Btu/scf (peak hourly) and 1,685 Btu/scf (average annual) were used in the calculations.

The following table details the post-modification pass-through organic emissions at the flare generated by a various continuous and intermittent waste gas streams:

**Table 2: Flaring Organics Pass-Through PTE**

Pollutant	Weight % <sup>(1)</sup>	lb/mmBtu <sup>(1)</sup>	Uncontrolled		Controlled @ 99%	
			lb/hr <sup>(2)</sup>	ton/yr <sup>(3)</sup>	lb/hr	ton/yr
VOCs	4.30	3.83	17,709.92	2,033.52	177.10	20.34
<i>Benzene</i>	0.08	0.10	462.40	53.09	4.62	0.53
<i>Ethylbenzene</i>	0.08	0.13	601.12	69.02	6.01	0.69
<i>n-Hexane</i>	0.09	0.12	554.88	63.71	5.55	0.64
<i>Toluene</i>	0.08	0.11	508.64	58.40	5.09	0.58
<i>2,2,4-TMP</i>	0.08	0.14	647.36	74.33	6.47	0.74
<i>Xylenes</i>	0.08	0.13	601.12	69.02	6.01	0.69
Total HAPs	0.49	0.74	3,421.76	392.90	34.22	3.93

(1) These values based on actual stream data taken from the Oak Grove Plant and summarized in Attachment H of the permit application.

(2) Based on the maximum short-term heat input of waste-gases sent to the flare: 4,624 mmBtu/hr.

(3) Based on the estimated maximum annual heat input of waste gases sent to the flare: 1,061,889 mmBtu/yr.

**Heater Emissions**

Potential emissions from the natural gas-fired heaters (1E through 7E) were based on emission factors provided by the unit vendors and as given in AP-42, Section 1.4. Hourly emissions were recalculated and based on the rated MDHI of each heater. Individual unit annual emissions were recalculated for the purposes of this permit on 8,760 hours of operation per year. A fuel gas heat content of 1,020 Btu/scf was used in the calculations.

### ***Amine Process Unit Emissions***

Potential emissions from the Amine Process Unit (16E) were based on process simulation by the Dow Chemical Company Gas Treating Technology Group and were revised to reflect changes in operating scenarios at the facility.

### ***Emergency Standby Generator***

Potential emissions from the 224 hp, Olympian Model G150LG2, LPG-fired reciprocating engine (9E) was based on the applicable emission standards given under 40 CFR 60, Subpart JJJ (CO and NO<sub>x</sub>) and emission factors given in AP-42, Section 3.2. Where applicable, hourly emissions were based on an MDHI of the unit of 2.19 mmBtu/hr (based on a conversion rate of 2,500 Btu/hp HHV) and annual emissions were based on operation of 500 hours per year.

### ***Storage Tanks***

Potential uncontrolled VOC emissions associated with the Slop Oil/Condensate Storage Tanks (10E through 13E) were calculated using the TANKS 4.09d program as provided under AP-42, Section 7. (working/breathing emissions) and were based on the ProMax software (flashing emissions). ProMax software is chemical process simulator for design and modeling of amine gas treating, glycol dehydration units, and other natural gas components.

### ***Truck Loading***

Air emissions from Slop Oil/Condensate truck loading operations (14E) occur as fugitive emissions generated by displacement of vapors when loading trucks. The emission factor used to generate the VOC emissions is based on Equation (1) of AP-42 Section 5.2-1. In this equation, OVM used variables specific to the liquids loaded and to the method of loading - in this case "splash loading." Additionally, worst-case annual emissions were based on a maximum loading of 4,000,000 gallons. Maximum hourly emission rates were based on a maximum hourly loading rate of ~250 gallons.

### ***Fugitive Emissions***

#### **Process and Piping Components**

OVM based their uncontrolled recalculated fugitive process and piping components leak calculations (15E) 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 the Table 5-2 and the use of a Leak Detection and Repair (LDAR) protocol that meets the minimum requirement of a 10,000 ppm<sub>v</sub> leak definition and monthly monitoring. VOC emissions were based on light liquid (100% by weight) and gas (24.02% by weight) VOC contents. HAP emissions were based on the actual speciated weight percentages of the HAPs in the applicable streams. Component counts were based on actual counts and design estimates.

## Other Equipment Leaks

OVM estimated new fugitive leaks of natural gas/propane from other potential sources such as leaks from dry gas seals, packing and gaskets, resulting from the wear of mechanical joints, seals, and rotating surfaces over time. The leak rates of these components are based on vendor and engineering estimates. VOC/HAP emissions rates are then based on representative gas samples.

### ***Emissions Summary***

Based on the above estimation methodology as submitted in Attachment N of the permit application, the revised post-modification facility-wide PTE of the Oak Grove Natural Gas Processing Facility is given in Attachment A. The change in annual facility-wide PTE as a result of the modifications evaluated herein is given in the following table:

**Table 3: Change in Facility-Wide Annual PTE (in tons/year)**

Pollutant	Pre-Modification	R13-3070A	Change
CO	72.27	192.66	120.39
NO <sub>x</sub>	41.64	121.26	79.62
PM <sub>2.5</sub> /PM <sub>10</sub> /PM	5.58	10.69	5.11
SO <sub>2</sub>	0.46	0.77	0.31
VOCs	72.09	112.06	39.97
Total HAPs	16.00	14.18	(1.82)

(1) Emissions taken from R13-3070 and PD15-057 Engineering Evaluation/Fact Sheets.

## **REGULATORY APPLICABILITY**

This section will address the potential regulatory applicability/non-applicability of substantive state and federal air quality rules relevant to the emission units/sources modified at the Oak Grove Natural Gas Processing Facility.

### ***45CSR2: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers.***

45CSR2 "establishes emission limitations for smoke and particulate matter which are discharged from fuel burning units." Each of the natural gas-fired heaters have each been determined to meet the definition of a "fuel burning unit" under 45CSR2 and are, therefore, subject to the applicable requirements therein. However, pursuant to the exemption given under §45-2-11, as the MDHI of the TXP1 Regeneration Gas Heater is less than 10 mmBtu/hr, this unit is not subject to sections 4, 5, 6, 8 and 9 of 45CSR2. The only remaining substantive requirement for the TXP1 Regeneration Gas Heater is under Section 3.1 - Visible Emissions Standards. Each substantive 45CSR2 requirement is discussed below.

### 45CSR2 Opacity Standard - Section 3.1

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

### 45CSR2 Weight Emission Standard - Section 4.1.b

The allowable particulate matter (PM) emission rate for each of the non-exempt natural gas-fired heaters, identified as Type "b" fuel burning units, per 45CSR2, Section 4.1(b), is the product of 0.09 and the total design heat input of the units in million Btu per hour. The maximum aggregate design heat input (short-term) of the non-exempt units will be 213.96 mmBtu/Hr. Using the above equation, the 45CSR2 facility-wide PM emission limit of the units will be 19.26 lb/hr. This limit represents filterable PM only and does not include condensable PM. The exemption of condensable PM is located within the 45CSR2 Appendix - which establishes compliance test procedures - by not requiring measurement of the condensable PM. The maximum potential hourly PM emissions during normal operations from the units (*including* condensables) is estimated to be 1.82 lb/hr. This emission rate is 9.44% of the 45CSR2 limit.

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

Section 8 of 45CSR2 requires testing for initial compliance with the limits under Section 3 and 4, monitoring for continued compliance, and record-keeping of that compliance. The TMR&R requirements are clarified under 45CSR2A and discussed below.

### 45CSR2A Applicability - Section 3

Pursuant to 45CSR2, Section 3.1(b), the owner or operator of a "fuel burning unit(s) which combusts only natural gas shall be exempt from sections 5 and 6." Therefore, there are no substantive performance testing or monitoring requirements under 45CSR2 for the fuel burning units (natural gas-fired heaters).

### 45CSR2A Record-keeping and Reporting Requirements - Section 7

Section 7 sets out the record-keeping requirements that OVM has to meet under 45CSR2A for the fuel burning units. For units that combust only pipeline natural gas, the record-keeping requirements are limited to the date and time of start-up and shutdown, and the quantity of fuel consumed on a monthly basis.

### ***45CSR6: To Prevent and Control Particulate Air Pollution from Combustion of Refuse***

OVM's flare is defined as an "incinerator" under 45CSR6 and is, therefore, subject to the requirements therein. The substantive requirements applicable to the units are discussed below.

### 45CSR6 Emission Standards for Incinerators - Section 4.1

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

$$\text{Emissions (lb/hr)} = F \times \text{Incinerator Capacity (tons/hr)}$$

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

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

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

Based on information included in the application, the capacity of the flare is 208,000 lb/hr (140 tons/hour). Pursuant to the above equation, the particulate matter limit of the flare is 380.80 lbs/hr. When properly operated, particulate matter emissions from the flare are expected to be negligible and in compliance with the limit calculated under Section 4.1. However, OVM did include a particulate matter emission estimate for the flare based on the use of an AP-42 emission factor for natural gas combustion. This emission factor produced a particulate matter emission rate of 19.50 lb/hr which is below the 45CSR6 limit.

### 45CSR6 Opacity Limits for - Section 4.3, 4.4

Pursuant to Section 4.3, and subject to the exemptions under 4.4, the flare has a 20% limit on opacity during operation. Proper design and operation of the flare should prevent any substantive opacity from the flare.

### ***45CSR10: To Prevent and Control Air Pollution from the Emission of Sulfur Oxides***

The purpose of 45CSR10 is to "prevent and control air pollution from the emission of sulfur oxides." 45CSR10 has requirements limiting SO<sub>2</sub> emissions from "fuel burning units," limiting in-stack SO<sub>2</sub> concentrations of "manufacturing process source operations," and limiting H<sub>2</sub>S concentrations in "process gas" streams that are combusted. As noted under the discussion of 45CSR2 applicability, the natural gas-fired heaters are each defined as a "fuel burning unit" and, therefore, subject to the applicable requirements discussed below.

### 45CSR10 Fuel Burning Units - Section 3

Pursuant to §45-10-10.1, as the MDHI of the TXP1 Regeneration Gas Heater is less than 10 mmBtu/hr, it is exempt from the requirements of Section 3.

The allowable sulfur dioxide (SO<sub>2</sub>) emissions from the non-exempt natural gas-fired heaters, each identified as a Type "b" fuel burning unit in a Priority I Region (which includes Marshall County), per 45CSR10, Section 3.1.e, is the product of 3.1 and the total design heat input of all units in million Btu per hour. The total design heat input of the non-exempt natural gas-fired heaters is 213.96 mmBtu/hr. Using the above equation results in a SO<sub>2</sub> limit of 663.28 pounds per hour. The

maximum aggregate potential SO<sub>2</sub> emissions from the Hot Oil Heaters are estimated to be 0.14 pounds per hour. This emission rate is only a trace of the 45CSR10 limit.

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

Section 8 of 45CSR10 requires testing for initial compliance with the limits therein, monitoring for continued compliance, and record-keeping of that compliance. Interpretative Rule 45CSR10A provides guidance and clarification for complying with the testing, monitoring, recordkeeping and reporting requirements of 45CSR10.

Pursuant to §45-10-10.3 and §45-10-3.1(b), as the natural gas-fired heaters “combust natural gas, wood or distillate oil, alone or in combination,” they are not subject to the Testing and MRR Requirements under Section 8 of 45CSR10 or 45CSR10A.

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

The proposed changes to the Oak Grove Natural Gas Processing Facility have the potential to increase the PTE of the facility in excess of six (6) lbs/hour and ten (10) TPY of a regulated pollutant (see Table 3 above) and, therefore, pursuant to §45-13-2.17, 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 January 15, 2015 in *Moundsville Daily Echo* and the affidavit of publication for this legal advertisement was submitted on January 30, 2015.

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

The Oak Grove Natural Gas Processing 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<sub>2</sub>. The Clay Tax District, where the Moundsville facility is located, is classified as “non-attainment” for SO<sub>2</sub>. Therefore, applicability to major New Source Review (NSR) for all pollutants except for SO<sub>2</sub> 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<sub>2</sub>) is 250 TPY. As given above in Attachment A, the facility-wide post-modification PTE of the Oak Grove Natural Gas Processing Facility 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 fo 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)***

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 is located in Marshall County, WV which is classified as in attainment with all NAAQS; with the exception for SO<sub>2</sub> 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<sub>2</sub> PTE of the Oak Grove Natural Gas Processing Facility is less than 100 TPY. Therefore, the facility is not defined as a "major stationary source" under 45CSR19.

***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. As a result of the changes evaluated herein, the facility will meet 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 is subject to 45CSR30. The Title V (45CSR30) application will be due within twelve (12) months after the commencement date of any operation authorized by the draft permit.

***40 CFR 60, Subpart Dc: Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units***

Subpart Dc of 40 CFR 60 is the federal NSPS for "steam generating units" that have a Maximum Design Heat Input (MDHI) of less than 100 MMBtu/Hr and greater than 10 MMBtu/Hr and that were constructed, modified, or reconstructed after June 9, 1989. Subpart Dc contains within it emission standards, compliance methods, monitoring requirements, and reporting and record-keeping procedures for affected facilities applicable to the rule.

Pursuant to §60.40c(a), Subpart Dc applies to "each steam generating unit that commences construction . . . after June 9, 1989, and that has a maximum design heat input capacity of. . . 100 mmBtu/hr or less, but greater than or equal to 10 mmBtu/hr." Subpart Dc defines a "Steam Generating Unit" as "a device that combusts any fuel and produces steam or heats water or heats any heat transfer medium." Each of the natural gas-fired heaters, with the exception of the TXP1 Regeneration Gas Heater (9.40 mmBtu/hr), meet the above applicability requirements and are subject

to the Subpart Dc. Subpart Dc does not, however, have any emission standards for combusting only natural gas. Therefore, the natural gas-fired heaters are only subject to the record-keeping and reporting requirements given under §60.48c.

***40 CFR 60, Subpart Kb: Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984 - (NON APPLICABILITY)***

Subpart Kb of 40 CFR 60 is the NSPS for storage tanks containing Volatile Organic Liquids (VOLs) which construction commenced after July 23, 1984. The Subpart applies to storage vessels used to store volatile organic liquids with a capacity greater than or equal to 75 m<sup>3</sup> (19,813 gallons). However, storage tanks with a capacity greater than or equal to 151 m<sup>3</sup> (39,890 gallons) storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (kPa) or with a capacity greater than or equal to 75 m<sup>3</sup> but less than 151 m<sup>3</sup> storing a liquid with a maximum true vapor pressure less than 15.0 kPa are exempt from Subpart Kb. Additionally, pursuant §60.110b(b)(2), “[p]ressure vessels designed to operate in excess of 204.9 kPa and without emissions to the atmosphere” are exempt from Subpart Kb.

None of the storage tanks located at the Oak Grove Natural Gas Processing Facility meet any of the above applicability requirements.

***40CFR60 Subpart KKK: Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants - (NON APPLICABILITY)***

40CFR60 Subpart KKK applies to onshore natural gas processing plants that commenced construction after January 20, 1984 and on or before August 23, 2011. The Oak Grove Natural Gas Processing Facility was constructed after August 23, 2011. OVM is required to meet all applicable LDAR requirements of Subpart OOOO for natural gas processing facilities (see below).

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

OVM’s proposed 224 hp, Olympian Model G150LG2, 4-Stroke Rich Burn (4SRB) LPG-fired reciprocating emergency engine is defined under 40 CFR 60, Subpart JJJJ as a stationary spark-ignition internal combustion engine (SI ICE) and is, pursuant to §60.4230(a)(4)(iv), subject to the applicable provisions of the rule (it is listed in the permit application as manufactured after July 1, 2010). Pursuant to §60.4233(c): “Owners and operators of stationary SI ICE with a maximum engine power greater than 19 KW (25 HP) manufactured on or after the applicable date in §60.4230(a)(4) that are rich burn engines that use LPG must comply with the emission standards in §60.4231(c) for their stationary SI ICE.” The language under §60.4231(c) states that “[s]tationary SI internal combustion engine manufacturers must certify their stationary SI ICE with a maximum engine power greater than 19 KW (25 HP) (except emergency stationary ICE with a maximum engine power greater than 25 HP and less than 130 HP) that are rich burn engines that use LPG and that are manufactured on or after the applicable date in §60.4230(a)(2), or manufactured on or after the applicable date in §60.4230(a)(4) for emergency stationary ICE with a maximum engine power greater than or equal to 130 HP, to the certification emission standards and other requirements for new nonroad SI engines in 40 CFR part 1048.”

Based on the engine's EPA Certificate of Conformity submitted by OVM, the engine family of the proposed engine is certified as in compliance with the 40 CFR part 1048 standards (in this case 2.0 g-(HC+NO<sub>x</sub>)/bhp-hr and 3.3 g-CO/bhp-hr).

***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 were previously not regulated at the federal level. Each section of Subpart OOOO potentially applicable to a new or modified source is discussed below.

**Reciprocating Compressors**

Each reciprocating compressor affected facility, which is a single reciprocating compressor located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment. For the purposes of this subpart, your reciprocating compressor is considered to have commenced construction on the date the compressor is installed (excluding relocation) at the facility. A reciprocating compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

There are three (3) reciprocating internal combustion engine located at the Oak Grove Natural Gas Processing Facility (the three electric compressors co-located at the "Independence Compressor Station") that were constructed after August 23, 2011. Therefore, the requirements regarding reciprocating compressors under 40 CFR 60 Subpart OOOO would apply. Williams is required to perform the following:

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

**Storage Tanks (NON-APPLICABILITY)**

Each storage vessel affected facility, which is a single storage vessel, located in the oil and natural gas production segment, natural gas processing segment, or natural gas transmission and

storage segment is potentially applicable to the storage tank requirements of Subpart OOOO. Subpart OOOO defines a storage vessel as a unit that is constructed primarily of non-earthen materials (such as wood, concrete, steel, fiberglass, or plastic) which provides structural support and is designed to contain an accumulation of liquids or other materials. The following are not considered storage vessels:

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

This rule requires that the permittee determine the VOC emission rate for each storage vessel affected facility utilizing a generally accepted model or calculation methodology within 30 days of startup, and minimize emissions to the extent practicable during the 30 day period using good engineering practices. For each storage vessel affected facility that emits more than 6 tons/year of VOCs, the permittee must reduce VOC emissions by 95% or greater within 60 days of startup. Based on a letter from USEPA to the American Petroleum Institute dated September 28, 2012, the applicability of storage vessels to this reduction requirement of Subpart OOOO is based on each individual tank's PTE (which includes federally enforceable control devices) as compared to the 6 tons/year.

Therefore, based on the above, the storage tanks located at the Oak Grove Natural Gas Processing Facility are exempt from Subpart OOOO as each of these tanks have uncontrolled emissions less than 6 tons/year.

#### 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 is a natural gas processing plant that was modified after August 23, 2011. Therefore, LDAR requirements for onshore natural gas processing plants will continue to apply to the facility.

#### ***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 Oak Grove Natural Gas Processing Facility 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 new standby engine proposed for the Oak Grove Natural Gas Processing Facility is defined as a new stationary RICE and, therefore, is required to show compliance with Subpart ZZZZ by meeting the requirements of 40 CFR 60, Subpart JJJJ. Compliance with Subpart JJJJ is discussed above.

### TOXICITY ANALYSIS OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the Oak Grove Natural Gas Processing Facility and that are not classified as “criteria pollutants.” Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NO<sub>x</sub>), Ozone, Particulate Matter (PM<sub>10</sub>, and PM<sub>2.5</sub>), and Sulfur Dioxide (SO<sub>2</sub>). 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 programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) standards 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 Oak Grove Natural Gas Processing Facility has the potential to emit the following HAPs in substantive amounts: Formaldehyde, n-Hexane, Benzene, Toluene, Ethylbenzene, Xylenes, and 2,2,4-Trimethylpentane. The following table lists each HAP’s 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
n-Hexane	VOC	No	Inadequate Data
Formaldehyde	VOC	Yes	B1 - Probable Human Carcinogen
Benzene	VOC	Yes	Category A - Known Human Carcinogen
Toluene	VOC	No	Inadequate Data

HAPs	Type	Known/Suspected Carcinogen	Classification
Ethyl-benzene	VOC	No	Category D - Not Classifiable
Xylenes	VOC	No	Inadequate Data
2,2,4-Trimethylpentane	VOC	No	Inadequate Data

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health effects 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](http://www.epa.gov/iris).

### **AIR QUALITY IMPACT ANALYSIS**

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

### **MONITORING, COMPLIANCE DEMONSTRATIONS, RECORD-KEEPING, AND REPORTING REQUIREMENTS**

The modifications evaluated herein were integrated into the existing monitoring, compliance demonstration, and reporting, and record-keeping requirements.

### **PERFORMANCE TESTING OF OPERATIONS**

The modifications evaluated herein were integrated into the performance testing requirements.

### **CHANGES TO R13-3070**

The following substantive changes were made to Permit Number R13-3070:

- The Emissions Units Table 1.0 was revised to reflect the changes evaluated herein;
- The Control Devices Table 1.1 was revised to list the updated emission units and sources sent to the flare for control;

- Section 5.0 was revised with updated MDHI and emissions of the natural gas-fired heaters;
- Requirement 6.1.1. was revised to reference the updated emission units and sources sent to the flare for control and a requirement was added to limit the maximum annual waste-gas flow rate to the flare;
- Table 6.1.2(a) was revised by removing the CO<sub>2</sub>e emission limits and the VOC pass-through emission limits. Additionally, the combustion exhaust emissions of the flare were revised to reflect the new emission calculations;
- Table 6.1.2(b) was added with the revised VOC pass-through emissions and the speciated HAP pass-through emissions;
- Requirement 6.1.3. was revised to include more specific model and operating data of the flare;
- Requirement 6.2.2. was revised to require OVM to monitor and record the aggregate waste-gas flow rate to the flare specifically to show compliance with the limit under 6.1.4.;
- The model, size, and emissions of the standby generator were updated in Section 7.0;
- The emissions of the Amine Process Vent were revised under Table 10.1.3;
- The truck loadout throughput limit was revised under Section 11.0; and
- The storage tank descriptions and throughput limits were revised under Section 12.0.

### **RECOMMENDATION TO DIRECTOR**

The information provided in permit application R13-3070A indicates that compliance with all applicable federal and state air quality regulations will be achieved. Therefore, I recommend to the Director the issuance of a Permit Number R13-3070A to Williams Ohio Valley Midstream, LLC for the modifications discussed herein at the Oak Grove Natural Gas Processing Facility located near Moundsville, Marshall County, WV.

  
 \_\_\_\_\_  
 Joe Kessler, PE  
 Engineer

11/23/15  
 \_\_\_\_\_  
 Date

Fact Sheet R13-3070A  
 Williams Ohio Valley Midstream, LLC  
 Oak Grove Natural Gas Processing Facility

**Attachment A: Facility-Wide PTE**  
**Williams Ohio Valley Midstream, LLC: Oak Grove Natural Gas Processing Facility**  
**Permit Number R13-3070A: Facility ID 051-00157**

Emission Unit	EP ID	CO		NO <sub>x</sub>		PM <sup>(1)</sup>		SO <sub>x</sub>		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	1273.91	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	0.00	177.30	20.36	5.48	0.63	34.38
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	0.00	0.00	0.00	0.00	0.00	0.00
Truck Loadout	14E	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
Amine Process Unit Vent	16E	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
Piping & Component Fugitives	15E	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
Misc. Equipment Leaks	17E-18E	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
Independence Compressor Station <sup>(2)</sup>	n/a	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
<b>Facility-Wide Total</b> →		<b>1286.36</b>	<b>192.66</b>	<b>650.00</b>	<b>121.26</b>	<b>21.43</b>	<b>10.69</b>	<b>1.68</b>	<b>0.77</b>	<b>225.80</b>	<b>112.06</b>	<b>6.97</b>	<b>3.71</b>	<b>41.42</b>	<b>14.18</b>
<b>Facility-Wide PTE<sup>(3)</sup></b> →		<b>1286.36</b>	<b>192.66</b>	<b>650.00</b>	<b>121.26</b>	<b>21.43</b>	<b>10.69</b>	<b>1.68</b>	<b>0.77</b>	<b>211.20</b>	<b>65.87</b>	<b>6.95</b>	<b>3.60</b>	<b>41.19</b>	<b>13.18</b>

(1) All particulate 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 is defined as a minor (area) source for purposes of 40 CFR 61 and 40CFR63.

*West Virginia Department of Environmental Protection*  
Earl Ray Tomblin  
Governor

*Division of Air Quality*

*Randy C. Huffman*  
Cabinet Secretary

# Permit to Modify



R13-3070A

*Entire Document*  
**NON-CONFIDENTIAL**

*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 above-referenced facility 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**  
**Oak Grove Natural Gas Processing Facility**  
**051-00157**

**DRAFT**

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*William F. Durham*  
Director

*Issued: DRAFT*

*This permit will supercede and replace R13-3070 issued on July 12, 2013.*

Facility Location: Moundsville, Marshall County, West Virginia  
Mailing Address: Park Place Corporate Center 2, 2000 Commerce Drive, Pittsburgh, PA 15275  
Facility Description: Natural Gas Processing Facility  
SIC Codes: 1321  
NAICS Codes: 211112  
UTM Coordinates: 525.9 km Easting • 4,414.1 km Northing • Zone 17  
Latitude/Longitude: 39.8758/-80.6959  
Permit Type: Modification  
Description of Change: Modification to make various changes at the facility including (1) increasing the amount of waste-gases combusted at the flare, (2) revising the maximum design heat input (MDHI) of the Hot Oil and Regeneration Heaters, (3) changing the size and model of the standby generator, and (4) increasing the amount of condensate/slop oil stored and loaded out of the 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.*

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*As a result of this permit, the source is a major source subject to 45CSR30. The Title V (45CSR30) application will be due within twelve (12) months after the commencement date of any operation authorized by this permit.*

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**1.0. Emission Units**

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed/Modified	Design Capacity	Control Device
H-01	1E	TXP1 Hot Oil Heater	2013	26.26 MMBTU/hr	None
H-02	2E	TXP1 Regen Gas Heater	2013	9.40 MMBTU/hr	None
H-03	3E	TXP2 Regen Gas Heater	2013	20.30 MMBTU/hr	None
H-04	4E	TXP3 Regen Gas Heater	2013	20.30 MMBTU/hr	None
H-05	5E	DeC2 Hot Oil Heater	2013	68.33 MMBTU/hr	None
H-06	6E	DeC2 Hot Oil Heater	2013	68.33 MMBTU/hr	None
H-07	7E	DeC2 Regen Gas Heater	2013	10.44 MMBTU/hr	None
FL-1	8E	Process Flare	2013	208,000 lb/hr	None
GEN-1	9E	Standby Generator	2013	224 HP	None
TK-1	10E	Slop Oil/Condensate	2013	16,800 gallon	None
TK-2	11E	Slop Oil/Condensate	2013	16,800 gallon	None
TK-3	12E	Slop Oil/Condensate	2013	16,800 gallon	None
TK-4	13E	Slop Oil/Condensate	2013	16,800 gallon	None
TL-1	14E	Truck Loadout	2013	4,000,000 gal/yr	None
FUG-G FUG-L	15E	Piping and Equipment Fugitives (Gas and Liquid Service)	2013	n/a	LDAR
V-01	16E	Amine Process Vent	2013	1,848,000 gal/day	FL-1 <sup>(1)</sup>
RPC	17E	Rod Packing – Reciprocating Compressors	2013	n/a	None
DGS	18E	Dry Gas Seals – Centrifugal Compressors	2013	n/a	None

(1) The amine unit flash tank offgas is either burned in the flare or used as fuel. The amine unit regenerator overheads are emitted directly to the atmosphere.

**1.1. Control Devices**

Emission Sources	Pollutant	Control Device	Control Efficiency
<u>Inlet Gas:</u> TXP Blowdowns TXP Start-Up and Dry-out Balance of Plant Volumes Filters Change-Out Compressor Maintenance Amine Unit Flash Gas Gas Pig Trap Blowdown Compressor Dry Gas Seals Other/Miscellaneous	Volatile Organic Compounds	Process Flare (FL-1)	99.0 %
<u>Ethane:</u> Ethane Feed <u>NGL:</u> Liquid Pig Trap Blowdown TXP Tanks Liquid Dry-Out Pump Maintenance: <u>Residue Gas:</u> Purge Gas Pilot Gas	Total HAPS	Process Flare (FL-1)	99.0 %

## 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 (45CSR§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

<b>CAAA</b>	Clean Air Act Amendments	<b>NO<sub>x</sub></b>	Nitrogen Oxides
<b>CBI</b>	Confidential Business Information	<b>NSPS</b>	New Source Performance Standards
<b>CEM</b>	Continuous Emission Monitor	<b>PM</b>	Particulate Matter
<b>CES</b>	Certified Emission Statement	<b>PM<sub>2.5</sub></b>	Particulate Matter less than 2.5 µm in diameter
<b>C.F.R. or CFR</b>	Code of Federal Regulations	<b>PM<sub>10</sub></b>	Particulate Matter less than 10µm in diameter
<b>CO</b>	Carbon Monoxide	<b>Ppb</b>	Pounds per Batch
<b>C.S.R. or CSR</b>	Codes of State Rules	<b>Pph</b>	Pounds per Hour
<b>DAQ</b>	Division of Air Quality	<b>Ppm</b>	Parts per Million
<b>DEP</b>	Department of Environmental Protection	<b>Ppm<sub>v</sub> or ppmv</b>	Parts per Million by Volume
<b>dscm</b>	Dry Standard Cubic Meter	<b>PSD</b>	Prevention of Significant Deterioration
<b>FOIA</b>	Freedom of Information Act	<b>Psi</b>	Pounds per Square Inch
<b>HAP</b>	Hazardous Air Pollutant	<b>SIC</b>	Standard Industrial Classification
<b>HON</b>	Hazardous Organic NESHAP	<b>SIP</b>	State Implementation Plan
<b>HP</b>	Horsepower	<b>SO<sub>2</sub></b>	Sulfur Dioxide
<b>lbs/hr</b>	Pounds per Hour	<b>TAP</b>	Toxic Air Pollutant
<b>LDAR</b>	Leak Detection and Repair	<b>TPY</b>	Tons per Year
<b>M</b>	Thousand	<b>TRS</b>	Total Reduced Sulfur
<b>MACT</b>	Maximum Achievable Control Technology	<b>TSP</b>	Total Suspended Particulate
<b>MDHI</b>	Maximum Design Heat Input	<b>USEPA</b>	United States Environmental Protection Agency
<b>MM</b>	Million	<b>UTM</b>	Universal Transverse Mercator
<b>MMBtu/hr or mmbtu/hr</b>	Million British Thermal Units per Hour	<b>VEE</b>	Visual Emissions Evaluation
<b>MMCF/hr or mmcf/hr</b>	Million Cubic Feet per Hour	<b>VOC</b>	Volatile Organic Compounds
<b>NA</b>	Not Applicable	<b>VOL</b>	Volatile Organic Liquids
<b>NAAQS</b>	National Ambient Air Quality Standards		
<b>NESHAPS</b>	National Emissions Standards for Hazardous Air Pollutants		

### **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 other 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 Application R13-3070A 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 -10.3.]
- 2.5.2. This permit will supercede and replace R13-3070. 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 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 emissions, 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 45CSR11.  
[45CSR§11-5.2.]

#### 3.2. Monitoring Requirements *[Reserved]*

#### 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 57<sup>th</sup> Street  
Charleston, WV 25304-2345

**If to the US EPA:**  
Associate Director  
Office of Air Enforcement and Compliance  
Assistance  
(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 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. **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.

4.1.2. **Minor Source of Hazardous Air Pollutants (HAP).** HAP emissions from the facility shall not exceed 10 tons/year of any single HAP and 25 tons/year of any combination of HAPs. Compliance with this Section shall ensure that the facility is a minor HAP source.

4.1.3. **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.]

4.1.4. **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.

**5.0. Source-Specific Requirements (Heaters, 1E-7E)**

**5.1. Limitations and Standards**

5.1.1. Maximum Design Heat Input. The maximum design heat input (MDHI) for Heaters (1E-7E) shall not exceed the values as given under Table 1.0: Emissions Units.

5.1.2. Maximum emissions from the 26.26 MMBTU/hr TXP1 Hot Oil Heater (1E) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	2.57	11.28
Carbon Monoxide	2.16	9.47
Volatile Organic Compounds	0.15	0.64

5.1.3. The hourly quantity of natural gas that shall be consumed in the 26.26 MMBTU/hr Hot Oil Heater (1E) shall not exceed 25,748 scf/hr.

5.1.4. The annual quantity of natural gas that shall be consumed in the 26.26 MMBTU/hr Hot Oil Heater (1E) shall not exceed 226 MMscf/yr.

5.1.5. Maximum emissions from the 9.40 MMBTU/hr TXP1 Regen Gas Heater (2E) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	0.92	4.04
Carbon Monoxide	0.77	3.39
Volatile Organic Compounds	0.05	0.23

5.1.6. The hourly quantity of natural gas that shall be consumed in the 9.40 MMBTU/hr TXP1 Regen Gas Heater (2E) shall not exceed 9,216 scf/hr.

5.1.7. The annual quantity of natural gas that shall be consumed in the 9.40 MMBTU/hr TXP1 Regen Gas Heater (2E) shall not exceed 81 MMscf/yr.

5.1.8. *[Reserved]*

5.1.9. Maximum emissions from the 20.30 MMBTU/hr TXP2 Regen Gas Heater (3E) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	0.73	3.20
Carbon Monoxide	0.81	3.56
Volatile Organic Compounds	0.39	1.69

- 5.1.21. The hourly quantity of natural gas that shall be consumed in the 10.44 MMBTU/hr De-Ethanizer Regen Gas Heater (7E) shall not exceed 10,237 standard cubic feet per hour.
- 5.1.22. The annual quantity of natural gas that shall be consumed in the 10.44 MMBTU/hr De-Ethanizer Regen Gas Heater (7E) shall not exceed  $89.68 \times 10^6$  standard cubic feet per year.
- 5.1.23. *[Reserved]*
- 5.1.24. No person shall cause, suffer, allow or permit emission of smoke and/or particulate matter into the open air from any fuel burning unit which is greater than ten (10) percent opacity based on a six minute block average.  
**[45CSR§2-3.1.]**
- 5.1.25. The permitted facility shall comply with all applicable provisions of 40CFR60 Subpart Dc, provided that compliance with any more stringent limitation set forth under this permit shall also be demonstrated. Recordkeeping and reporting requirements shall be conducted in accordance with §60.48c. These reports shall be submitted in accordance with the time lines and in the order set forth in §60.48c and submitted to the addresses listed in Section 3.5.3.

## **5.2. Monitoring Requirements**

- 5.2.1. At such reasonable times as the Secretary may designate, the permittee shall conduct Method 9 emission observations for the purpose of demonstrating compliance with Section 5.1.24. Method 9 shall be conducted in accordance with 40 CFR 60 Appendix A.

## **5.3. Testing Requirements**

- 5.3.1. Compliance with the visible emission requirements of section 5.1.24 shall be determined in accordance with 40 CFR Part 60, Appendix A, Method 9 or by using measurements from continuous opacity monitoring systems approved by the Director. The Director may require the installation, calibration, maintenance and operation of continuous opacity monitoring systems and may establish policies for the evaluation of continuous opacity monitoring results and the determination of compliance with the visible emission requirements of section 5.1.24. Continuous opacity monitors shall not be required on fuel burning units which employ wet scrubbing systems for emission control.  
**[45CSR§2-3.2.]**

## **5.4. Recordkeeping Requirements**

- 5.4.1. To demonstrate compliance with sections 5.1.1-5.1.23, the permittee shall maintain a monthly record of the amount of natural gas consumed and the hours of operation of each of the heaters (1E-7E). Compliance with the maximum throughput limitation shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the monthly throughput at any given time during the previous twelve consecutive calendar months. Said records shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.
- 5.4.2. Except as provided under paragraphs (g)(2) and (g)(3) of this section, the owner or operator of each affected facility shall record and maintain records of the amount of each fuel combusted during each operating day.  
**[40CFR§60.48(c)(g)(1)]**

- 5.4.3. As an alternative to meeting the requirements of paragraph (g)(1) of this section, the owner or operator of an affected facility that combusts only natural gas, wood, fuels using fuel certification in §60.48c(f) to demonstrate compliance with the SO<sub>2</sub> standard, fuels not subject to an emissions standard (excluding opacity), or a mixture of these fuels may elect to record and maintain records of the amount of each fuel combusted during each calendar month.  
[40CFR§60.48 (c)(g)(2)]
- 5.4.4. As an alternative to meeting the requirements of paragraph (g)(1) of this section, the owner or operator of an affected facility or multiple affected facilities located on a contiguous property unit where the only fuels combusted in any steam generating unit (including steam generating units not subject to this subpart) at that property are natural gas, wood, distillate oil meeting the most current requirements in §60.42C to use fuel certification to demonstrate compliance with the SO<sub>2</sub> standard, and/or fuels, excluding coal and residual oil, not subject to an emissions standard (excluding opacity) may elect to record and maintain records of the total amount of each steam generating unit fuel delivered to that property during each calendar month.  
[40CFR§60.48(c)(g)(3)]

## 5.5. Reporting Requirements

- 5.5.1. The owner or operator of each affected facility shall submit notification of the date of construction or reconstruction and actual startup, as provided by §60.7 of this part. This notification shall include:
1. The design heat input capacity of the affected facility and identification of fuels to be combusted in the affected facility.
  2. If applicable, a copy of any federally enforceable requirement that limits the annual capacity factor for any fuel or mixture of fuels under §60.42c, or §60.43c.
  3. The annual capacity factor at which the owner or operator anticipates operating the affected facility based on all fuels fired and based on each individual fuel fired.
  4. Notification if an emerging technology will be used for controlling SO<sub>2</sub> emissions. The Administrator will examine the description of the control device and will determine whether the technology qualifies as an emerging technology. In making this determination, the Administrator may require the owner or operator of the affected facility to submit additional information concerning the control device. The affected facility is subject to the provisions of §60.42c(a) or (b)(1), unless and until this determination is made by the Administrator.  
[40CFR§60.48c(a)]
- 5.5.2. The reporting period for the reports required under this subpart is each six-month period. All reports shall be submitted to the Administrator and shall be postmarked by the 30th day following the end of the reporting period.  
[40CFR§60.48c(j)]

**6.0. Source-Specific Requirements (Flare Control Device, 8E)**

**6.1. Limitations and Standards**

6.1.1. In accordance with information in permit application R13-3070A, the permittee shall install and operate a Process Flare (8S) designed to achieve, at a minimum, a 99.0% destruction and removal efficiency (DRE) of VOCs and organic HAPS from the sources identified under Control Devices Table 1.1. The maximum aggregate amount of waste gases sent to the Process Flare from these sources shall not exceed 630.19 MMscf/yr based on a rolling 12 month total.

6.1.2. Maximum emissions from the Zeeco flare (8E) shall not exceed the following limits:

a. The maximum aggregate emissions generated at the Process Flare (8E) from the combustion of waste gases and the pilot light shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	638.12	73.27
Carbon Monoxide	1,273.91	146.28

b. The maximum emissions of VOCs and HAPs at the Process Flare (representing un-combusted pass-through organic vapors that are generated at one of the sources identified under 6.1.1.) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
VOCs	177.30	20.36
<i>Benzene</i>	4.49	0.52
<i>Ethylbenzene</i>	6.09	0.70
<i>n-Hexane</i>	5.48	0.63
<i>Toluene</i>	5.30	0.61
<i>2,2,4-TMP</i>	6.55	0.75
<i>Xylenes</i>	6.11	0.70
<b>Total HAPs</b>	<b>34.38</b>	<b>3.95</b>

6.1.3. The installed Process Flare (8S) shall be a Zeeco Model Number AFTA-24/80, shall have a maximum waste-gas capacity of 208,000 lb/hr, shall have an MDHI of 4,624 mmBtu/hr, and shall be designed and operated in accordance with the following:

- a. Flare shall be air-assisted.
- b. Flare shall be designed for and operated with no visible emissions, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.
- c. Flare shall be operated, with a flame present at all times whenever emissions may be vented to it, except during SSM (Startup, Shutdown, Malfunctions) events.

- d. A flare shall be used only where the net heating value of the gas being combusted is 11.2 MJ/scm (300 Btu/scf) or greater if the flare is steam-assisted or air-assisted; or where the net heating value of the gas being combusted is 7.45 MJ/scm (200 Btu/scf) or greater if the flares is non-assisted. The net heating value of the gas being combusted in a flare shall be calculated using the following equation:

$$H_T = K \sum_{i=1}^n C_i H_i$$

Where:

$H_T$ =Net heating value of the sample, MJ/scm; where the net enthalpy per mole of off gas is based on combustion at 25 °C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20 °C.

K=Constant=

$$1.740 \times 10^{-7} \left( \frac{1}{ppmv} \right) \left( \frac{\text{g-mole}}{\text{scm}} \right) \left( \frac{\text{MJ}}{\text{kcal}} \right)$$

where the standard temperature for (g-mole/scm) is 20 °C.

$C_i$ =Concentration of sample component i in ppmv on a wet basis, which may be measured for organics by Test Method 18, but is not required to be measured using Method 18 (unless designated by the Director).

$H_i$ =Net heat of combustion of sample component i, kcal/g-mole at 25 °C and 760 mm Hg. The heats of combustion may be determined using ASTM D2382-76 or 88 or D4809-95 if published values are not available or cannot be calculated.

n=Number of sample components.

- e. Air-assisted flares shall be designed and operated with an exit velocity less than the velocity  $V_{max}$ . The maximum permitted velocity,  $V_{max}$ , for air-assisted flares shall be determined by the following equation:

$$V_{max} = 8.71 + 0.708(H_T)$$

Where:

$V_{max}$ =Maximum permitted velocity, m/sec.

8.71=Constant.

0.708=Constant.

$H_T$ =The net heating value as determined in 6.1.3.d.

- 6.1.4. The permittee is not required to conduct a flare compliance assessment for concentration of sample (i.e. Method 18) and tip velocity (i.e. Method 2) until such time as the Director requests a flare compliance assessment to be conducted in accordance with section 6.3.2, but the permittee is required to conduct a flare design evaluation in accordance with section 6.4.2. Alternatively, the permittee may elect to demonstrate compliance with the flare design criteria requirements of section 6.1.3 by complying with the compliance assessment testing requirements of section 6.3.2.

## 6.2. Monitoring Requirements

- 6.2.1. In order to demonstrate compliance with the requirements of 6.1.3.c, the permittee shall monitor the presence or absence of a flare pilot flame using a thermocouple or any other equivalent device, except during SSM events.
- 6.2.2. In order to determine compliance with 6.1.1., the permittee shall monitor and record the monthly and rolling twelve (12) month total aggregate waste gases, pilot gas, and purge gas sent to the flare (in MMscf) from the sources identified under Control Devices Table 1.1.

### **6.3. Testing Requirements**

- 6.3.1. In order to demonstrate compliance with the flare opacity requirements of 6.1.3.b the permittee shall conduct a Method 22 opacity test for at least two hours. This test shall demonstrate no visible emissions are observed for more than a total of 5 minutes during any 2 consecutive hour period using 40CFR60 Appendix A Method 22. The permittee shall conduct this test within one (1) year of R13-3070 permit issuance or initial startup whichever is later. The visible emission checks shall determine the presence or absence of visible emissions. At a minimum, the observer must be trained and knowledgeable regarding the effects of background contrast, ambient lighting, observer position relative to lighting, wind, and the presence of uncombined water (condensing water vapor) on the visibility of emissions. This training may be obtained from written materials found in the References 1 and 2 from 40 CFR part 60, appendix A, Method 22 or from the lecture portion of 40 CFR part 60, appendix A, Method 9 certification course.
- 6.3.2. The Director may require the permittee to conduct a flare compliance assessment to demonstrate compliance with section 6.1.5. This compliance assessment testing shall be conducted in accordance with appropriate test methods or other equivalent testing as approved in writing by the Director.

### **6.4. Recordkeeping Requirements**

- 6.4.1. For the purpose of demonstrating compliance with section 6.1.3.c and 6.2.1, the permittee shall maintain records of the times and duration of all periods which the pilot flame was absent.
- 6.4.2. For the purpose of demonstrating compliance with section 6.1.3 and 6.3.2, the permittee shall maintain a record of the flare design evaluation. The flare design evaluation shall include, net heat value calculations, exit (tip) velocity calculations, and all supporting concentration calculations and other related information requested by the Director.
- 6.4.3. For the purpose of demonstrating compliance with the requirements set forth in sections 6.1.3, the permittee shall maintain records of testing conducted in accordance with 6.3.2.
- 6.4.4. The permittee shall document and maintain the corresponding records specified by the on-going monitoring requirements of 6.2 and testing requirements of 6.3.
- 6.4.5. For the purpose of demonstrating compliance with section 6.1.3.b, the permittee shall maintain records of the visible emission opacity tests conducted per Section 6.3.1.
- 6.4.6. All records required under Section 6.3 shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

### **6.5. Reporting Requirements**

- 6.5.1. If permittee is required by the Director to demonstrate compliance with section 6.3.2, then the permittee shall submit a testing protocol at least thirty (30) days prior to testing and shall submit a notification of the testing date at least fifteen (15) days prior to testing. The permittee shall submit the testing results within sixty (60) days of testing and provide all supporting calculations and testing data.
- 6.5.2. Any deviation(s) from the allowable visible emission requirement for any emission source discovered during observations using 40CFR Part 60, Appendix A, Method 9 or 22 shall be reported in writing to the Director of the Division of Air Quality as soon as practicable, but in any case within ten (10) calendar days of the occurrence and shall include at least the following

information: the results of the visible determination of opacity of emissions, the cause or suspected cause of the violation(s), and any corrective measures taken or planned.

- 6.5.3. Any deviation(s) from the flare design and operation criteria in Section 6.1.3 shall be reported in writing to the Director of the Division of Air Quality as soon as practicable, but in any case within ten (10) calendar days of discovery of such deviation.

## 7.0. Source-Specific Requirements (Standby Generator, 9E)

### 7.1. Limitations and Standards

- 7.1.1. To demonstrate compliance with Section 7.1.2, the quantity of natural gas that shall be consumed in the 224 hp liquid propane gas (LPG)-fired reciprocating engine, an Olympian Model G150LG2 (9E), shall not exceed 878 cubic feet per hour and 440,000 cubic feet per year.
- 7.1.2. Maximum emissions from the 224 hp LPG-fired reciprocating engine, an Olympian Model G150LG2 (9E); shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxide	0.99	0.25
Carbon Monoxide	1.98	0.49
VOCs	0.54	0.13
Formaldehyde	0.04	0.01

- 7.1.3. **Maximum Yearly Operation Limitation.** The maximum yearly hours of operation for the 224 hp LPG-fired reciprocating engine, an Olympian Model G150LG2 (9E), shall not exceed 500 hours per year. Compliance with the Maximum Yearly Operation Limitation shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the hours of operation at any given time during the previous twelve consecutive calendar months.

### 7.2. Recordkeeping Requirements

- 7.2.1. To demonstrate compliance with sections 7.1.1-7.1.3, the permittee shall maintain records of the hours of operation of the engine (9E). Said records shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

**8.0. Source-Specific Requirements (40CFR60 Subpart JJJJ Requirements, Standby Generator, 9E)**

**8.1. Limitations and Standards**

- 8.1.1. Owners and operators of stationary SI ICE with a maximum engine power greater than 19 KW (25 HP) manufactured on or after the applicable date in §60.4230(a)(4) that are rich burn engines that use LPG must comply with the emission standards in §60.4231(c) for their stationary SI ICE.  
[40CFR§60.4233(c)]
- 8.1.2. Stationary SI internal combustion engine manufacturers must certify their stationary SI ICE with a maximum engine power greater than 19 KW (25 HP) (except emergency stationary ICE with a maximum engine power greater than 25 HP and less than 130 HP) that are rich burn engines that use LPG and that are manufactured on or after the applicable date in §60.4230(a)(2), or manufactured on or after the applicable date in §60.4230(a)(4) for emergency stationary ICE with a maximum engine power greater than or equal to 130 HP, to the certification emission standards and other requirements for new nonroad SI engines in 40 CFR part 1048. Stationary SI internal combustion engine manufacturers must certify their emergency stationary SI ICE greater than 25 HP and less than 130 HP that are rich burn engines that use LPG and that are manufactured on or after the applicable date in §60.4230(a)(4) to the Phase 1 emission standards in 40 CFR 90.103, applicable to class II engines, and other requirements for new nonroad SI engines in 40 CFR part 90. Stationary SI internal combustion engine manufacturers may certify their stationary SI ICE with a maximum engine power less than or equal to 30 KW (40 HP) with a total displacement less than or equal to 1,000 cc that are rich burn engines that use LPG to the certification emission standards and other requirements for new nonroad SI engines in 40 CFR part 90 or 1054, as appropriate.  
[40CFR§60.4231(c)]

**9.0. Source-Specific Requirements (Gas Processing Plant, 40CFR60 Subpart OOOO Requirements: Piping and Equipment Fugitives (15E) & Reciprocating Compressors (17E))**

**9.1. Limitations and Standards**

9.1.1. **Maximum Throughput Limitation.** The total maximum wet natural gas throughput through the Gas Processing Plant shall not exceed 660 mmscf/day.

9.1.2. You must comply with the standards in paragraphs (a) through (d) of this section for each reciprocating compressor affected facility.

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

1. 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.

2. 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.

b. You must demonstrate initial compliance with standards that apply to reciprocating compressor affected facilities as required by § 60.5410.

c. You must demonstrate continuous compliance with standards that apply to reciprocating compressor affected facilities as required by § 60.5415.

d. You must perform the required notification, recordkeeping, and reporting as required by § 60.5420.

**[40CFR§60.5385, Reciprocating Compressors (17E)]**

9.1.3. What equipment leak standards apply to affected facilities at an onshore natural gas processing plant?

This section applies to the group of all equipment, except compressors, within a process unit.

a. You must comply with the requirements of §§ 60.482-1a(a), (b), and (d), 60.482-2a, and 60.482-4a through 60.482-11a, except as provided in § 60.5401.

b. You may elect to comply with the requirements of §§ 60.483-1a and 60.483-2a, as an alternative.

c. You may apply to the Administrator for permission to use an alternative means of emission limitation that achieves a reduction in emissions of VOC at least equivalent to that achieved by the controls required in this subpart according to the requirements of § 60.5402 of this subpart.

d. You must comply with the provisions of § 60.485a of this part except as provided in paragraph (f) of this section.

e. You must comply with the provisions of §§ 60.486a and 60.487a of this part except as provided in §§ 60.5401, 60.5421, and 60.5422 of this part.

- f. You must use the following provision instead of § 60.485a(d)(1): Each piece of equipment is presumed to be in VOC service or in wet gas service unless an owner or operator demonstrates that the piece of equipment is not in VOC service or in wet gas service. For a piece of equipment to be considered not in VOC service, it must be determined that the VOC content can be reasonably expected never to exceed 10.0 percent by weight. For a piece of equipment to be considered in wet gas service, it must be determined that it contains or contacts the field gas before the extraction step in the process. For purposes of determining the percent VOC content of the process fluid that is contained in or contacts a piece of equipment, procedures that conform to the methods described in ASTM E169-93, E168-92, or E260-96 (incorporated by reference as specified in § 60.17) must be used.  
**[40CFR§60.5400, Onshore Natural Gas Processing Plant]**

9.1.4. What are the exceptions to the equipment leak standards for affected facilities at onshore natural gas processing plants?

- a. You may comply with the following exceptions to the provisions of § 60.5400(a) and (b).
- b. 1. Each pressure relief device in gas/vapor service may be monitored quarterly and within 5 days after each pressure release to detect leaks by the methods specified in § 60.485a(b) except as provided in § 60.5400(c) and in paragraph (b)(4) of this section, and § 60.482-4a(a) through (c) of subpart VVa.
2. If an instrument reading of 500 ppm or greater is measured, a leak is detected.
3. i. When a leak is detected, it must be repaired as soon as practicable, but no later than 15 calendar days after it is detected, except as provided in § 60.482-9a.
- ii. A first attempt at repair must be made no later than 5 calendar days after each leak is detected.
4. i. Any pressure relief device that is located in a nonfractionating plant that is monitored only by non-plant personnel may be monitored after a pressure release the next time the monitoring personnel are on-site, instead of within 5 days as specified in paragraph (b)(1) of this section and § 60.482-4a(b)(1) of subpart VVa.
- ii. No pressure relief device described in paragraph (b)(4)(i) of this section must be allowed to operate for more than 30 days after a pressure release without monitoring.
- a. Sampling connection systems are exempt from the requirements of § 60.482-5a.
- b. Pumps in light liquid service, valves in gas/vapor and light liquid service, and pressure relief devices in gas/vapor service that are located at a nonfractionating plant that does not have the design capacity to process 283,200 standard cubic meters per day (scmd) (10 million standard cubic feet per day) or more of field gas are exempt from the routine monitoring requirements of §§ 60.482-2a(a)(1) and 60.482-7a(a), and paragraph (b)(1) of this section.
- c. Pumps in light liquid service, valves in gas/vapor and light liquid service, and pressure relief devices in gas/vapor service within a process unit that is located in the Alaskan North Slope are exempt from the routine monitoring requirements of §§ 60.482-2a(a)(1), 60.482-7a(a), and paragraph (b)(1) of this section.
- d. An owner or operator may use the following provisions instead of § 60.485a(e):
1. Equipment is in heavy liquid service if the weight percent evaporated is 10 percent or less at 150 °C (302 °F) as determined by ASTM Method D86-96 (incorporated by reference as specified in § 60.17).

2. Equipment is in light liquid service if the weight percent evaporated is greater than 10 percent at 150 °C (302 °F) as determined by ASTM Method D86-96 (incorporated by reference as specified in § 60.17).

- e. An owner or operator may use the following provisions instead of § 60.485a(b)(2): A calibration drift assessment shall be performed, at a minimum, at the end of each monitoring day. Check the instrument using the same calibration gas(es) that were used to calibrate the instrument before use. Follow the procedures specified in Method 21 of appendix A-7 of this part, Section 10.1, except do not adjust the meter readout to correspond to the calibration gas value. Record the instrument reading for each scale used as specified in § 60.486a(e)(8). Divide these readings by the initial calibration values for each scale and multiply by 100 to express the calibration drift as a percentage. If any calibration drift assessment shows a negative drift of more than 10 percent from the initial calibration value, then all equipment monitored since the last calibration with instrument readings below the appropriate leak definition and above the leak definition multiplied by (100 minus the percent of negative drift/divided by 100) must be re-monitored. If any calibration drift assessment shows a positive drift of more than 10 percent from the initial calibration value, then, at the owner/operator's discretion, all equipment since the last calibration with instrument readings above the appropriate leak definition and below the leak definition multiplied by (100 plus the percent of positive drift/divided by 100) may be re-monitored.

**[40CFR§60.5401, Onshore Natural Gas Processing Plant]**

9.1.5. What are the alternative emission limitations for equipment leaks from onshore natural gas processing plants?

- a. If, in the Administrator's judgment, an alternative means of emission limitation will achieve a reduction in VOC emissions at least equivalent to the reduction in VOC emissions achieved under any design, equipment, work practice or operational standard, the Administrator will publish, in the Federal Register, a notice permitting the use of that alternative means for the purpose of compliance with that standard. The notice may condition permission on requirements related to the operation and maintenance of the alternative means.
- b. Any notice under paragraph (a) of this section must be published only after notice and an opportunity for a public hearing.
- c. The Administrator will consider applications under this section from either owners or operators of affected facilities, or manufacturers of control equipment.
- d. The Administrator will treat applications under this section according to the following criteria, except in cases where the Administrator concludes that other criteria are appropriate:
1. The applicant must collect, verify and submit test data, covering a period of at least 12 months, necessary to support the finding in paragraph (a) of this section.
  2. If the applicant is an owner or operator of an affected facility, the applicant must commit in writing to operate and maintain the alternative means so as to achieve a reduction in VOC emissions at least equivalent to the reduction in VOC emissions achieved under the design, equipment, work practice or operational standard.

**[40CFR§60.5402, Onshore Natural Gas Processing Plant]**

**9.2. Initial Compliance Demonstration**

- 9.2.1. You must determine initial compliance with the standards for each affected facility using the requirements in paragraph (c) and (f) of this section. The initial compliance period begins on October 15, 2012 or upon initial startup, whichever is later, and ends no later than one year after the initial startup date for your affected facility or no later than one year after October 15, 2012. The initial compliance period may be less than one full year.

- c. To achieve initial compliance with the standards for each reciprocating compressor affected facility you must comply with paragraphs (c)(1) through (4) of this section.
  - 1. During the initial compliance period, you must continuously monitor the number of hours of operation or track the number of months since the last rod packing replacement.
  - 2. You must submit the notifications required in 60.7(a)(1), (3), and (4).
  - 3. You must submit the initial annual report for your reciprocating compressor as required in § 60.5420(b).
  - 4. You must maintain the records as specified in § 60.5420(c)(3) for each reciprocating compressor affected facility.
- f. For affected facilities at onshore natural gas processing plants, initial compliance with the VOC requirements is demonstrated if you are in compliance with the requirements of § 60.5400.  
[40CFR§60.5410, Reciprocating Compressors (17E), Onshore Natural Gas Processing Plant]

### 9.3. Continuous Compliance Demonstration

- 9.3.1. For each reciprocating compressor affected facility, you must demonstrate continuous compliance according to paragraphs (1) through (3) of this section.
  - 1. You must continuously monitor the number of hours of operation for each reciprocating compressor affected facility or track the number of months since initial startup, or October 15, 2012, or the date of the most recent reciprocating compressor rod packing replacement, whichever is later.
  - 2. You must submit the annual report as required in § 60.5420(b) and maintain records as required in § 60.5420(c)(3).
  - 3. You must replace the reciprocating compressor rod packing before the total number of hours of operation reaches 26,000 hours or the number of months since the most recent rod packing replacement reaches 36 months.
- 9.3.2. For affected facilities at onshore natural gas processing plants, continuous compliance with VOC requirements is demonstrated if you are in compliance with the requirements of § 60.5400.
- 9.3.3. Affirmative defense for violations of emission standards during malfunction. In response to an action to enforce the standards set forth in §§ 60.5375, you may assert an affirmative defense to a claim for civil penalties for violations of such standards that are caused by malfunction, as defined at § 60.2. Appropriate penalties may be assessed, however, if you fail to meet your burden of proving all of the requirements in the affirmative defense. The affirmative defense shall not be available for claims for injunctive relief.

(1) To establish the affirmative defense in any action to enforce such a standard, you must timely meet the reporting requirements in § 60.5420(a), and must prove by a preponderance of evidence that:

(i) The violation:

(A) Was caused by a sudden, infrequent, and unavoidable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner; and

(B) Could not have been prevented through careful planning, proper design or better operation and maintenance practices; and

(C) Did not stem from any activity or event that could have been foreseen and avoided, or planned for; and

(D) Was not part of a recurring pattern indicative of inadequate design, operation, or maintenance; and

(ii) Repairs were made as expeditiously as possible when a violation occurred. Off-shift and overtime labor were used, to the extent practicable to make these repairs; and

(iii) The frequency, amount and duration of the violation (including any bypass) were minimized to the maximum extent practicable; and

(iv) If the violation resulted from a bypass of control equipment or a process, then the bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; and

(v) All possible steps were taken to minimize the impact of the violation on ambient air quality, the environment and human health; and

(vi) All emissions monitoring and control systems were kept in operation if at all possible, consistent with safety and good air pollution control practices; and

(vii) All of the actions in response to the violation were documented by properly signed, contemporaneous operating logs; and

(viii) At all times, the affected source was operated in a manner consistent with good practices for minimizing emissions; and

(ix) A written root cause analysis has been prepared, the purpose of which is to determine, correct, and eliminate the primary causes of the malfunction and the violation resulting from the malfunction event at issue. The analysis shall also specify, using best monitoring methods and engineering judgment, the amount of any emissions that were the result of the malfunction.

(2) Report. The owner or operator seeking to assert an affirmative defense shall submit a written report to the Administrator with all necessary supporting documentation, that it has met the requirements set forth in paragraph (h)(1) of this section. This affirmative defense report shall be included in the first periodic compliance, deviation report or excess emission report otherwise required after the initial occurrence of the violation of the relevant standard (which may be the end of any applicable averaging period). If such compliance, deviation report or excess emission report is due less than 45 days after the initial occurrence of the violation, the affirmative defense report may be included in the second compliance, deviation report or excess emission report due after the initial occurrence of the violation of the relevant standard.

[40CFR§60.5415]

#### **9.4. Notification, Recordkeeping and Reporting Requirements**

9.4.1. You must submit the notifications required in § 60.7(a)(1) and (4), and according to paragraphs (a)(1) and (2) of this section, if you own or operate one or more of the affected facilities specified in § 60.5365 that was constructed, modified, or reconstructed during the reporting period.

(1) If you own or operate a gas well, pneumatic controller or storage vessel affected facility you are not required to submit the notifications required in § 60.7(a)(1), (3), and (4).

(2) (i) If you own or operate a gas well affected facility, you must submit a notification to the Administrator no later than 2 days prior to the commencement of each well completion operation listing the anticipated date of the well completion operation. The notification shall include contact information for the owner or operator; the API well number, the latitude and

longitude coordinates for each well in decimal degrees to an accuracy and precision of five (5) decimals of a degree using the North American Datum of 1983; and the planned date of the beginning of flowback. You may submit the notification in writing or in electronic format.

(ii) If you are subject to state regulations that require advance notification of well completions and you have met those notification requirements, then you are considered to have met the advance notification requirements of paragraph (a)(2)(i) of this section.

9.4.2. Reporting requirements. You must submit annual reports containing the information specified in paragraphs (b)(1) and (b)(4) of this section to the Administrator and performance test reports as specified in paragraph (b)(7) of this section. The initial annual report is due 30 days after the end of the initial compliance period as determined according to § 60.5410. Subsequent annual reports are due on the same date each year as the initial annual report. If you own or operate more than one affected facility, you may submit one report for multiple affected facilities provided the report contains all of the information required as specified in paragraphs (b)(1) through (6) of this section. Annual reports may coincide with title V reports as long as all the required elements of the annual report are included. You may arrange with the Administrator a common schedule on which reports required by this part may be submitted as long as the schedule does not extend the reporting period.

(1) The general information specified in paragraphs (b)(1)(i) through (iv) of this section.

(i) The company name and address of the affected facility.

(ii) An identification of each affected facility being included in the annual report.

(iii) Beginning and ending dates of the reporting period.

(iv) A certification by a responsible official of truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

(4) For each reciprocating compressor affected facility, the information specified in paragraphs (b)(4)(i) through (ii) of this section.

(i) The cumulative number of hours of operation or the number of months since initial startup, October 15, 2012, or since the previous reciprocating compressor rod packing replacement, whichever is later.

(ii) Records of deviations specified in paragraph (c)(3)(iii) of this section that occurred during the reporting period.

(7) (i) Within 60 days after the date of completing each performance test (see § 60.8 of this part) as required by this subpart you must submit the results of the performance tests required by this subpart to EPA's WebFIRE database by using the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) ([www.epa.gov/cdx](http://www.epa.gov/cdx)). Performance test data must be submitted in the file format generated through use of EPA's Electronic Reporting Tool (ERT) (see <http://www.epa.gov/ttn/chief/ert/index.html>). Only data collected using test methods on the ERT Web site are subject to this requirement for submitting reports electronically to WebFIRE. Owners or operators who claim that some of the information being submitted for performance tests is confidential business information (CBI) must submit a complete ERT file including information claimed to be CBI on a compact disk or other commonly used electronic storage media (including, but not limited to, flash drives) to EPA. The electronic media must be clearly marked as CBI and mailed to U.S. EPA/OAPQS/CORE CBI Office, Attention: WebFIRE Administrator, MD C404-02, 4930 Old Page Rd., Durham, NC 27703. The same ERT file with the CBI omitted must be submitted to EPA via CDX as described earlier in this paragraph. At the discretion of the delegated authority, you must also submit

these reports, including the confidential business information, to the delegated authority in the format specified by the delegated authority.

(ii) All reports required by this subpart not subject to the requirements in paragraph (a)(2)(i) of this section must be sent to the Administrator at the appropriate address listed in § 63.13 of this part. The Administrator or the delegated authority may request a report in any form suitable for the specific case (e.g., by commonly used electronic media such as Excel spreadsheet, on CD or hard copy). The Administrator retains the right to require submittal of reports subject to paragraph (a)(2)(i) and (ii) of this section in paper format.

9.4.3. Recordkeeping requirements. You must maintain the records identified as specified in § 60.7(f) and in paragraph (c)(3) of this section. All records must be maintained for at least 5 years.

(3) For each reciprocating compressors affected facility, you must maintain the records in paragraphs (c)(3)(i) through (iii) of this section.

(i) Records of the cumulative number of hours of operation or number of months since initial startup or October 15, 2012, or the previous replacement of the reciprocating compressor rod packing, whichever is later.

(ii) Records of the date and time of each reciprocating compressor rod packing lacement.

(iii) Records of deviations in cases where the reciprocating compressor was not operated in compliance with the requirements specified in § 60.5385.

**[40CFR§60.5420]**

9.4.4. What are my additional recordkeeping requirements for my affected facility subject to VOC requirements for onshore natural gas processing plants?

a. You must comply with the requirements of paragraph (b) of this section in addition to the requirements of § 60.486a.

b. The following recordkeeping requirements apply to pressure relief devices subject to the requirements of § 60.5401(b)(1) of this subpart.

1. When each leak is detected as specified in § 60.5401(b)(2), a weatherproof and readily visible identification, marked with the equipment identification number, must be attached to the leaking equipment. The identification on the pressure relief device may be removed after it has been repaired.

2. When each leak is detected as specified in § 60.5401(b)(2), the following information must be recorded in a log and shall be kept for 2 years in a readily accessible location:

i. The instrument and operator identification numbers and the equipment identification number.

ii. The date the leak was detected and the dates of each attempt to repair the leak.

iii. Repair methods applied in each attempt to repair the leak.

iv. "Above 500 ppm" if the maximum instrument reading measured by the methods specified in paragraph (a) of this section after each repair attempt is 500 ppm or greater.

v. "Repair delayed" and the reason for the delay if a leak is not repaired within 15 calendar days after discovery of the leak.

vi. The signature of the owner or operator (or designate) whose decision it was that repair could not be effected without a process shutdown.

- vii. The expected date of successful repair of the leak if a leak is not repaired within 15 days.
- viii. Dates of process unit shutdowns that occur while the equipment is unrepaired.
- ix. The date of successful repair of the leak.
- x. A list of identification numbers for equipment that are designated for no detectable emissions under the provisions of § 60.482-4a(a). The designation of equipment subject to the provisions of § 60.482-4a(a) must be signed by the owner or operator.

**[40CFR§60.5421, Onshore Natural Gas Processing Plant]**

9.4.5. What are my additional reporting requirements for my affected facility subject to VOC requirements for onshore natural gas processing plants?

- a. You must comply with the requirements of paragraphs (b) and (c) of this section in addition to the requirements of § 60.487a(a), (b), (c)(2)(i) through (iv), and (c)(2)(vii) through (viii).
- b. An owner or operator must include the following information in the initial semiannual report in addition to the information required in § 60.487a(b)(1) through (4): Number of pressure relief devices subject to the requirements of § 60.5401(b) except for those pressure relief devices designated for no detectable emissions under the provisions of § 60.482-4a(a) and those pressure relief devices complying with § 60.482-4a(c).
- c. An owner or operator must include the following information in all semiannual reports in addition to the information required in § 60.487a(c)(2)(i) through (vi):
  - 1. Number of pressure relief devices for which leaks were detected as required in § 60.5401(b)(2); and
  - 2. Number of pressure relief devices for which leaks were not repaired as required in § 60.5401(b)(3).

**[40CFR§60.5422, Onshore Natural Gas Processing Plant]**

## **9.5. Recordkeeping Requirements**

- 9.5.1. To demonstrate compliance with section 9.1.1 the permittee shall maintain records of the amount of natural gas processed in the Gas Processing Plant. Said records required shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

## 10.0. Source-Specific Hazardous Air Pollutant Requirements (Amine Process Vent, 16E)

### 10.1. Limitations and Standards

- 10.1.1. **Maximum Throughput Limitation.** The maximum ethane feedstock to the amine system shall not exceed 44,000 barrels/day.
- 10.1.2. The amine system (16E) shall be designed and operated in accordance with the following:
- a. Carbon dioxide will be removed from the ethane product in an amine contacting system.
  - b. The total ethane product shall be contacted with a amine solution in the contactor where the carbon dioxide in the ethane product is removed.
  - c. The rich amine from the Contactor is regenerated in the Amine Regenerator where heat input is used to drive the carbon dioxide and water overhead and vented to the atmosphere.
  - d. The lean amine from the bottom of the Regenerator is recycled back to the Amine Contactor.
- 10.1.3. Maximum emissions from the Amine System (16E) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Volatile Organic Compounds	0.11	0.49

### 10.2. Monitoring Requirements

- 10.2.1. The permittee shall monitor the throughput of ethane feedstock fed to the Amine Process (16E) on a monthly basis.

### 10.3. Recordkeeping Requirements

- 10.3.1. The permittee shall maintain a record of the ethane product throughput to the Amine Process Vent (16E) to demonstrate compliance with section 10.1.1 of this permit. Said records shall be maintained for a period of five (5) years on site or in a readily accessible off-site location maintained by the permittee. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

## **11.0. Source-Specific Requirements (Truck Loadout, 14E)**

### **11.1. Limitations and Standards**

- 11.1.1. The maximum quantity of slop oil (condensate) that shall be loaded (14E) shall not exceed 4,000,000 gallons per year.
- 11.1.2. The Truck Loadout (14E) shall be operated in accordance with the plans and specifications filed in Permit Application R13-3070A unless the changes do not meet the definition of a modification in 45CFR13.

### **11.2. Recordkeeping Requirements**

- 11.2.1. For the purpose of demonstrating compliance with section 11.1.1, the permittee shall maintain records of the amount of slop oil (condensate) loaded from the Truck Loadout (14E).
- 11.2.2. All records required under Section 11.2 shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

## 12.0. Source-Specific Requirements (Storage Tanks, 10E-13E)

### 12.1. Limitations and Standards

12.1.1. The maximum throughput to the storage tanks (10E-13E) shall not exceed the following:

Emission Point ID#	Emission Unit Description	Maximum Annual Throughput (gallons/year)
10E	Slop Oil (Condensate) Tank (00-ST-826)	1,000,000
11E	Slop Oil (Condensate) Tank (00-ST-827)	1,000,000
12E	Slop Oil (Condensate) Tank (00-ST-844)	1,000,000
13E	Slop Oil (Condensate) Tank (00-ST-845)	1,000,000

### 12.2. Recordkeeping Requirements

- 12.2.1. For the purpose of demonstrating compliance with section 12.1.1, the permittee shall maintain records of the maximum tank throughput of the storage tanks (10E-13E)
- 12.2.2. All records required under Section 12.2 shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

### 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<sup>1</sup> \_\_\_\_\_  
(please use blue ink) Responsible Official or Authorized Representative Date

Name & Title \_\_\_\_\_  
(please print or type) Name Title

Telephone No. \_\_\_\_\_ Fax No. \_\_\_\_\_

- <sup>1</sup> 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 U.S. EPA); or
  - d. The designated representative delegated with such authority and approved in advance by the Director.

# INTERNAL PERMITTING DOCUMENT TRACKING MANIFEST

Company Name WILLIAMS OHIO VALLEY MIDSTREAM, LLC

Permitting Action Number R13-3070A Total Days 314 DAQ Days 4

**Permitting Action:**

- |   |                                    |   |
|---|------------------------------------|---|
| <input type="radio"/> Permit Determination  | <input type="radio"/> Temporary    | <input checked="" type="radio"/> Modification |
| <input type="radio"/> General Permit        | <input type="radio"/> Relocation   | <input type="radio"/> PSD (Rule 14)           |
| <input type="radio"/> Administrative Update | <input type="radio"/> Construction | <input type="radio"/> NNSR (Rule 19)          |

**Documents Attached:**

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Engineering Evaluation/Memo   | <input checked="" type="checkbox"/> Completed Database Sheet |
| <input checked="" type="checkbox"/> Draft Permit                  | <input type="checkbox"/> Withdrawal                          |
| <input checked="" type="checkbox"/> Notice                        | <input type="checkbox"/> Letter                              |
| <input type="checkbox"/> Denial                                   | <input type="checkbox"/> Other (specify) _____               |
| <input type="checkbox"/> Final Permit/General Permit Registration | _____  |

Date	From	To	Action Requested
11/23/15	Joe Kessler	Bev McKeone	NOTICE APPROVAL
11/25	Bev	Joe	Go to Notice

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

**Kessler, Joseph R**

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**From:** Kessler, Joseph R  
**Sent:** Monday, November 23, 2015 10:17 AM  
**To:** 'Zawaski, Danell'  
**Subject:** RE: Oak Grove - Subpart OOOO

Danell, I have made most of your requested changes and submitted the draft for permission to go to notice. However, I believe my JJJ citations for the emergency generator in the draft are correct. We can revisit in the notice period.

Joe

---

**From:** Zawaski, Danell [mailto:Danell.Zawaski@williams.com]  
**Sent:** Thursday, November 19, 2015 5:52 PM  
**To:** Kessler, Joseph R  
**Cc:** Baldauff, Erika; Zawaski, Danell; Duke, Dave  
**Subject:** RE: Oak Grove - Subpart OOOO

I.D. No. 051-00157 Reg. 3070A  
Company OVM  
Facility OAK GROVE Region \_\_\_\_\_  
Initials DZ

Thank you, Joe. Attached are our pre-draft comments.  
Regards,  
Danell

*R. Danell Zawaski, PE*  
Environmental Specialist  
NEGP Environmental Services  
304-843-3133 Moundsville  
412/787-4259 Pittsburgh  
505/787-7926 cell  
412/787-6002 fax  
[Danell.zawaski@williams.com](mailto:Danell.zawaski@williams.com)

*Entire Document*  
**NON-CONFIDENTIAL**

**From:** Kessler, Joseph R [mailto:Joseph.R.Kessler@wv.gov]  
**Sent:** Thursday, November 19, 2015 9:22 AM  
**To:** Zawaski, Danell <[Danell.Zawaski@williams.com](mailto:Danell.Zawaski@williams.com)>  
**Subject:** RE: Oak Grove - Subpart OOOO

OK, I have updated the standby generator emissions in the draft permit. I will now deem the application formally complete (you will see that e-mail today). I am now waiting for any comments from you on the pre-draft prior to submitting to Bev for permission to go to notice.

Joe

---

**From:** Zawaski, Danell [mailto:Danell.Zawaski@williams.com]  
**Sent:** Tuesday, November 17, 2015 3:26 PM  
**To:** Kessler, Joseph R  
**Subject:** FW: Oak Grove - Subpart OOOO

As requested.

*R. Danell Zawaski, PE*  
Environmental Specialist  
NEGP Environmental Services

304-843-3133 Moundsville  
412/787-4259 Pittsburgh  
505/787-7926 cell  
412/787-6002 fax  
[Danell.zawaski@williams.com](mailto:Danell.zawaski@williams.com)

**From:** Walter Konkel [<mailto:wkonkel@elogicllc.com>]  
**Sent:** Thursday, November 12, 2015 1:19 PM  
**To:** Zawaski, Danell <[Danell.Zawaski@williams.com](mailto:Danell.Zawaski@williams.com)>  
**Subject:** RE: Oak Grove - Subpart OOOO

The updated engine calculation sheet for Attachment N is attached.

Walter Konkel  
EcoLogic Environmental Consultants, LLC  
(805) 964-7597 (office)  
(805) 284-4430 (mobile)  
[wkonkel@elogicllc.com](mailto:wkonkel@elogicllc.com)

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**From:** Zawaski, Danell [<mailto:Danell.Zawaski@williams.com>]  
**Sent:** Thursday, November 12, 2015 10:10 AM  
**To:** Walter Konkel  
**Subject:** FW: Oak Grove - Subpart OOOO

*R. Danell Zawaski, PE*

Environmental Specialist  
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304-843-3133 Moundsville  
412/787-4259 Pittsburgh  
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412/787-6002 fax  
[Danell.zawaski@williams.com](mailto:Danell.zawaski@williams.com)

**From:** Kessler, Joseph R [<mailto:Joseph.R.Kessler@wv.gov>]  
**Sent:** Thursday, November 12, 2015 1:07 PM  
**To:** Zawaski, Danell <[Danell.Zawaski@williams.com](mailto:Danell.Zawaski@williams.com)>  
**Subject:** RE: Oak Grove - Subpart OOOO

OK, I will just update the Section 7 CO limit on the engine to 3.3 g/bhp-hr (1.63 lb/hr). Please correct the standby engine calculation page in Attachment N and send it to me (e-mail is fine).

Joe

---

**From:** Zawaski, Danell [<mailto:Danell.Zawaski@williams.com>]  
**Sent:** Thursday, November 12, 2015 10:44 AM  
**To:** Kessler, Joseph R  
**Subject:** FW: Oak Grove - Subpart OOOO

See Walter's response.

*R. Danell Zawaski, PE*

Environmental Specialist  
NEGP Environmental Services  
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**From:** Walter Konkel [<mailto:wkonkel@elogicllc.com>]  
**Sent:** Thursday, November 12, 2015 10:35 AM  
**To:** Zawaski, Danell <[Danell.Zawaski@williams.com](mailto:Danell.Zawaski@williams.com)>  
**Subject:** RE: Oak Grove - Subpart OOOO

I reviewed the NSPS JJJJ emission standards again that are applicable to the Oak Grove emergency generator engine, including the link Joe provided. In summary, I now agree with Joe that the applicable emission standards for the 4SRB LPG fired emergency generator engine are found in 40 CFR Part 1048 [see §1048.101(a)(2)] .

The applicable emission standards are: HC + NOX = 2.7 g/kW-hr (2.0 g/bhp-hr) and CO = 4.4 g/kW-hr (3.3 g/bhp-hr). This is compared to the 2.0 g NOx/bhp-hr and 4.0 g CO/bhp-hr emission standards that were shown in the permit application.

Note the attached certificate of conformity for the engine is consistent with the 40 CFR Part 1048 emission standards.

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---

**From:** Zawaski, Danell [<mailto:Danell.Zawaski@williams.com>]  
**Sent:** Thursday, November 12, 2015 6:37 AM  
**To:** Walter Konkel  
**Subject:** FW: Oak Grove - Subpart OOOO

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**From:** Kessler, Joseph R [<mailto:Joseph.R.Kessler@wv.gov>]  
**Sent:** Thursday, November 12, 2015 9:36 AM  
**To:** Zawaski, Danell <[Danell.Zawaski@williams.com](mailto:Danell.Zawaski@williams.com)>  
**Subject:** RE: Oak Grove - Subpart OOOO

I agree JJJJ is absurdly confusing and that 4233(c) does not specifically cite "emergency engines." But I don't agree with Walter's reasoning here, and the EPA RICE tool also points the engine toward Part 1048.

<http://www3.epa.gov/ttn/atw/ice/quiz.html>

Joe Kessler

---

**From:** Zawaski, Danell [<mailto:Danell.Zawaski@williams.com>]  
**Sent:** Tuesday, November 10, 2015 12:38 PM  
**To:** Kessler, Joseph R  
**Subject:** FW: Oak Grove - Subpart OOOO

I will call you after lunch to discuss.

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**From:** Walter Konkel [<mailto:wkonkel@elogicllc.com>]  
**Sent:** Tuesday, November 10, 2015 12:04 PM  
**To:** Zawaski, Danell <[Danell.Zawaski@williams.com](mailto:Danell.Zawaski@williams.com)>  
**Subject:** RE: Oak Grove - Subpart OOOO

Danell – The basis for the applicable NSPS JJJJ emission standards for the Oak Grove Emergency Generator engine is as follows:

The emergency generator is a 224 bhp four stroke rich burn engine fired on propane. The applicable emission standards are taken from Table 1 of NSPS JJJJ, — *NOX, CO, and VOC Emission Standards for Stationary Non-Emergency SI Engines ≥100 HP (Except Gasoline and Rich Burn LPG), Stationary SI Landfill/Digester Gas Engines, and Stationary Emergency Engines >25 HP*. The applicable standards are 2.0 g NOx/bhp-hr, 4.0 g CO/bhp-hr and 1.0 g VOC/bhp-hr.

I would like to call attention to Table 1 of NSPS JJJJ. The title of the table is read as NOX, CO, and VOC Emission Standards for Stationary Non-Emergency SI Engines ≥100 HP (Except Gasoline and Rich Burn LPG Stationary Non-Emergency SI Engines [emphasis added]), Stationary SI Landfill/Digester Gas Engines, and Stationary Emergency Engines >25 HP. The placement of the commas in the table heading leads one to believe that ALL stationary emergency engines, regardless of the fuel fired, are subject to emission standards found in Table 1 to NSPS JJJJ.

Engines with emission standards referenced in §60.4233:

- (a) Owners and operators of stationary SI ICE with a maximum engine power less than or equal to 19 KW (25 HP) manufactured on or after July 1, 2008
- (b) Owners and operators of stationary SI ICE with a maximum engine power greater than 19 KW (25 HP) manufactured on or after the applicable date in §60.4230(a)(4) that use gasoline
- (c) Owners and operators of stationary SI ICE with a maximum engine power greater than 19 KW (25 HP) manufactured on or after the applicable date in §60.4230(a)(4) that are rich burn engines that use LPG
- (d) Owners and operators of stationary SI ICE with a maximum engine power greater than 19 KW (25 HP) and less than 75 KW (100 HP) (except gasoline and rich burn engines that use LPG)

None of the above referenced engines are found in Table 1 to NSPS JJJJ below. Engines identified in (b),(c) and (d) above are concluded to be gasoline and rich burn LPG engines that are stationary non-emergency SI engines.

**Table 1 to Subpart JJJJ of Part 60—NO<sub>x</sub>, CO, and VOC Emission Standards for Stationary Non-Emergency SI Engines ≥100 HP (Except Gasoline and Rich Burn LPG), Stationary SI Landfill/Digester Gas Engines ≥100 HP, and Stationary Emergency Engines >25 HP**

Engine type and fuel	Maximum engine power	Manufacture date	Emission standards (g/HP-hr)	
			NO <sub>x</sub>	CO
Non-Emergency SI Natural Gas <sup>b</sup> and Non-Emergency SI Lean Burn LPG <sup>b</sup>	100≤HP<500	7/1/2008	2.0	4.0
		1/1/2011	1.0	2.0
Non-Emergency SI Lean Burn Natural Gas and LPG	500≤HP<1,350	1/1/2008	2.0	4.0
		7/1/2010	1.0	2.0
Non-Emergency SI Natural Gas and Non-Emergency SI Lean Burn LPG (except lean burn 500≤HP<1,350)	HP≥500	7/1/2007	2.0	4.0
		7/1/2010	1.0	2.0
Landfill/Digester Gas (except lean burn 500≤HP<1,350)	HP<500	7/1/2008	3.0	5.0
		1/1/2011	2.0	5.0
	HP≥500	7/1/2007	3.0	5.0
		7/1/2010	2.0	5.0
Landfill/Digester Gas Lean Burn	500≤HP<1,350	1/1/2008	3.0	5.0
		7/1/2010	2.0	5.0
Emergency	25<HP<130	1/1/2009	≤10	387
			2.0	4.0

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---

**From:** Zawaski, Danell [<mailto:Danell.Zawaski@williams.com>]  
**Sent:** Wednesday, November 04, 2015 12:31 PM  
**To:** Walter Konkel  
**Subject:** FW: Oak Grove - Subpart OOOO

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**From:** Kessler, Joseph R [<mailto:Joseph.R.Kessler@wv.gov>]  
**Sent:** Wednesday, November 04, 2015 3:27 PM  
**To:** Zawaski, Danell <[Danell.Zawaski@williams.com](mailto:Danell.Zawaski@williams.com)>  
**Subject:** RE: Oak Grove - Subpart OOOO

As a 4SRB LPG engine, I read JJJ as, pursuant to §60.4233(c), and then through §60.4231(c), as pointing to the emission standards under 40 CFR part 1048 and not Table 1. As the emissions of the new engine were based on the JJJ Table 1 limits, this may need to be altered. Trying to figure out what the standards are under 1048 is confusing for an individual engine. Please let me know what you think.

Joe

---

**From:** Zawaski, Danell [<mailto:Danell.Zawaski@williams.com>]  
**Sent:** Wednesday, November 04, 2015 1:47 PM  
**To:** Kessler, Joseph R  
**Subject:** RE: Oak Grove - Subpart OOOO

That appears correct to us.

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**From:** Kessler, Joseph R [<mailto:Joseph.R.Kessler@wv.gov>]  
**Sent:** Wednesday, November 04, 2015 10:11 AM  
**To:** Zawaski, Danell <[Danell.Zawaski@williams.com](mailto:Danell.Zawaski@williams.com)>  
**Subject:** Oak Grove - Subpart OOOO

Danell, it looks like Jerry applied Subpart OOOO reciprocating compressor requirements to the standby generator under 3070. That unit is to provide backup power, correct? So, as it is not compressing any gas, I don't believe OOOO applies to that unit. However, it does apply to the electric compressors at the co-located "Independence Compressor Station," which I can integrate into this permit.

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*This permit will supercede and replace R13-3070 issued on July 12, 2013.*

Facility Location: Moundsville, Marshall County, West Virginia  
Mailing Address: Park Place Corporate Center 2, 2000 Commerce Drive, Pittsburgh, PA 15275200-Caiman Drive, Moundsville, WV 26041  
Facility Description: Natural Gas Processing Facility  
SIC Codes: 1321  
NAICS Codes: 211112  
UTM Coordinates: 525.9 km Easting • 4,414.1 km Northing • Zone 17  
Latitude/Longitude: 39.8758/-80.6959  
Permit Type: Modification  
Description of Change: Modification to make various changes at the facility including (1) increasing the amount of waste-gases combusted at the flare, (2) revising the maximum design heat input (MDHI) of the Hot Oil and Regeneration Heaters, (3) changing the size and model of the standby generator, and (4) increasing the amount of condensate/slop oil stored and loaded out of the facility.

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*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.*

*As a result of this permit, the source is a major source subject to 45CSR30. The Title V (45CSR30) application will be due within twelve (12) months after the commencement date of any operation authorized by this permit.*

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**1.0. Emission Units**

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed/Modified	Design Capacity	Control Device
H-01	1E	TXP1 Hot Oil Heater	2013	26.26 MMBTU/hr	None
H-02	2E	TXP1 Regen Gas Heater	2013	9.40 MMBTU/hr	None
H-03	3E	TXP2 Regen Gas Heater	2013	20.30 MMBTU/hr	None
H-04	4E	TXP3 Regen Gas Heater	2013	20.30 MMBTU/hr	None
H-05	5E	DeC2 Hot Oil Heater	2013	68.33 MMBTU/hr	None
H-06	6E	DeC2 Hot Oil Heater	2013	68.33 MMBTU/hr	None
H-07	7E	DeC2 Regen Gas Heater	2013	10.44 MMBTU/hr	None
FL-1	8E	Process Flare	2013	208,000 lb/hr	None
GEN-1	9E	Standby Generator	2013	224 HP	None
TK-1	10E	Slop Oil/Condensate	2013	16,800 gallon	None
TK-2	11E	Slop Oil/Condensate	2013	16,800 gallon	None
TK-3	12E	Slop Oil/Condensate	2013	16,800 gallon	None
TK-4	13E	Slop Oil/Condensate	2013	16,800 gallon	None
TL-1	14E	Truck Loadout	2013	4,000,000 gal/yr	None
FUG-G FUG-L	15E	Piping and Equipment Fugitives (Gas and Liquid Service)	2013	n/a	LDAR
V-01	16E	Amine Process Vent	2013	1,848,000 gal/day	FL-1
RPC	17E	Rod Packing – Reciprocating Compressors	2013	n/a	None
DGS	18E	Dry Gas Seals – Centrifugal Compressors	2013	n/a	None

The amine unit flash tank offgas is burned in the flare or used as fuel. The amine unit regenerator overheads are emitted directly to the atmosphere. The above table indicates that ALL amine unit emissions are controlled by the flare. Please change.

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**1.1. Control Devices**

Emission Sources	Pollutant	Control Device	Control Efficiency
<b>Inlet Gas:</b> TXP Blowdowns TXP Start-Up and Dry-out Balance of Plant Volumes Filters Change-Out Compressor Maintenance Amine Unit Flash Gas Gas Pig Trap Blowdown Compressor Dry Gas Seals Other/Miscellaneous	Volatile Organic Compounds	Process Flare (FL-1)	99.0 %
<b>Ethane:</b> Ethane Feed <b>NGL:</b> Liquid Pig Trap Blowdown TXP Tanks Liquid Dry-Out Pump Maintenance: <b>Residue Gas:</b> Purge Gas Pilot Gas	Total HAPS		99.0 %

**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 (45CSR§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**

<b>CAAA</b>	Clean Air Act Amendments	<b>NO<sub>x</sub></b>	Nitrogen Oxides
<b>CBI</b>	Confidential Business Information	<b>NSPS</b>	New Source Performance Standards
<b>CEM</b>	Continuous Emission Monitor	<b>PM</b>	Particulate Matter
<b>CES</b>	Certified Emission Statement	<b>PM<sub>2.5</sub></b>	Particulate Matter less than 2.5 µm in diameter
<b>C.F.R. or CFR</b>	Code of Federal Regulations	<b>PM<sub>10</sub></b>	Particulate Matter less than 10µm in diameter
<b>CO</b>	Carbon Monoxide	<b>Ppb</b>	Pounds per Batch
<b>C.S.R. or CSR</b>	Codes of State Rules Division of Air Quality Department of Environmental Protection	<b>Pph</b>	Pounds per Hour
<b>DAQ</b>	Department of Environmental Protection	<b>Ppm</b>	Parts per Million
<b>DEP</b>	Dry Standard Cubic Meter	<b>Ppm<sub>v</sub> or ppmv</b>	Parts per Million by Volume
<b>dscm</b>	Freedom of Information Act	<b>PSD</b>	Prevention of Significant Deterioration
<b>FOIA</b>	Hazardous Air Pollutant	<b>Psi</b>	Pounds per Square Inch
<b>HAP</b>	Hazardous Organic NESHAP	<b>SIC</b>	Standard Industrial Classification
<b>HON</b>	Horsepower	<b>SIP</b>	State Implementation Plan
<b>HP</b>	Pounds per Hour	<b>SO<sub>2</sub></b>	Sulfur Dioxide
<b>lbs/hr</b>	Leak Detection and Repair	<b>TAP</b>	Toxic Air Pollutant
<b>LDAR</b>	Thousand	<b>TPY</b>	Tons per Year
<b>M</b>	Maximum Achievable	<b>TRS</b>	Total Reduced Sulfur
<b>MACT</b>	Control Technology	<b>TSP</b>	Total Suspended Particulate
	Maximum Design Heat Input	<b>USEPA</b>	United States Environmental Protection Agency
<b>MDHI MM</b>	Million	<b>UTM</b>	Universal Transverse Mercator
<b>MMBtu/hr or mmbtu/hr</b>	Million British Thermal Units per Hour	<b>VEE</b>	Visual Emissions Evaluation
<b>MMCF/hr or mmcf/hr</b>	Million Cubic Feet per Hour	<b>VOC</b>	Volatile Organic Compounds
<b>NA</b>	Not Applicable	<b>VOL</b>	Volatile Organic Liquids
<b>NAAQS</b>	National Ambient Air Quality Standards		
<b>NESHAPS</b>	National Emissions Standards for Hazardous Air Pollutants		

### **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 other 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 Application R13-3070A 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 -10.3.]
- 2.5.2. This permit will supercede and replace R13-3070. 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 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 emissions, 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 45CSR11.  
[45CSR§11-5.2.]

#### 3.2. Monitoring Requirements

*[Reserved]*

#### 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 57<sup>th</sup> Street  
Charleston, WV 25304-2345

**If to the US EPA:**

Associate Director  
Office of Air Enforcement and Compliance  
Assistance  
(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 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. **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.
- 4.1.2. **Minor Source of Hazardous Air Pollutants (HAP).** HAP emissions from the facility shall not exceed 10 tons/year of any single HAP and 25 tons/year of any combination of HAPs. Compliance with this Section shall ensure that the facility is a minor HAP source.
- 4.1.3. **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.]
- 4.1.4. **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.

**5.0. Source-Specific Requirements (Heaters, 1E-7E)**

**5.1. Limitations and Standards**

5.1.1. **Maximum Design Heat Input.** The maximum design heat input (MDHI) for Heaters (1E-7E) shall not exceed the values as given under Table 1.0: Emissions Units.

5.1.2. Maximum emissions from the 26.26 MMBTU/hr TXP1 Hot Oil Heater (1E) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	2.57	11.28
Carbon Monoxide	2.16	9.47
Volatile Organic Compounds	0.15	0.64

5.1.3. The hourly quantity of natural gas that shall be consumed in the 26.26 MMBTU/hr Hot Oil Heater (1E) shall not exceed 25,748 scf/hr.

5.1.4. The annual quantity of natural gas that shall be consumed in the 26.26 MMBTU/hr Hot Oil Heater (1E) shall not exceed 226 MMscf/yr.

5.1.5. Maximum emissions from the 9.40 MMBTU/hr TXP1 Regen Gas Heater (2E) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	0.92	4.04
Carbon Monoxide	0.77	3.39
Volatile Organic Compounds	0.05	0.23

5.1.6. The hourly quantity of natural gas that shall be consumed in the 9.40 MMBTU/hr TXP1 Regen Gas Heater (2E) shall not exceed 9,216 scf/hr.

5.1.7. The annual quantity of natural gas that shall be consumed in the 9.40 MMBTU/hr TXP1 Regen Gas Heater (2E) shall not exceed 81 MMscf/yr.

5.1.8. *[Reserved]*

5.1.9. Maximum emissions from the 20.30 MMBTU/hr TXP2 Regen Gas Heater (3E) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	0.73	3.20
Carbon Monoxide	0.81	3.56
Volatile Organic Compounds	0.39	1.69

5.1.10. The hourly quantity of natural gas that shall be consumed in the 20.30 MMBTU/hr TXP2 Regen Gas Heater (3E) shall not exceed 19,900-902 scf/hr.

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5.1.11. The annual quantity of natural gas that shall be consumed in the 20.30 MMBTU/hr TXP2 Regen Gas Heater (3E) shall not exceed 175 MMscf/yr.

5.1.12. [Reserved]

5.1.13. Maximum emissions from the 20.30 MMBTU/hr TXP2 Regen Gas Heater (4E) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	0.73	3.20
Carbon Monoxide	0.81	3.56
Volatile Organic Compounds	0.39	1.69

5.1.14. The hourly quantity of natural gas that shall be consumed in the 20.30 MMBTU/hr TXP2 Regen Gas Heater (4E) shall not exceed 19,900-902 scf/hr.

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5.1.15. The annual quantity of natural gas that shall be consumed in the 20.30 MMBTU/hr TXP2 Regen Gas Heater (4E) shall not exceed 175 MMscf/yr.

5.1.16. [Reserved]

5.1.17. Maximum emissions from each of the 63-68.33 MMBTU/hr De-Ethanizer Hot Oil Heaters (5E, 6E) shall not exceed the following limits:

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Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	2.46	10.77
Carbon Monoxide	2.53	11.07
Volatile Organic Compounds	0.38	1.67

5.1.18. The hourly quantity of natural gas that shall be consumed in each of the 68.33 MMBTU/hr De-Ethanizer Hot Oil Heaters (5E, 6E) shall not exceed 67,000 scf/hr.

5.1.19. The annual quantity of natural gas that shall be consumed in each of the 68.33 MMBTU/hr De-Ethanizer Hot Oil Heaters (5E, 6E) shall not exceed 587 MMscf/yr.

5.1.20. Maximum emissions from the 10,193-44 MMBTU/hr De-Ethanizer Regen Gas Heater (7E) shall not exceed the following limits:

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Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	1.02	4.48
Carbon Monoxide	0.86	3.77
Volatile Organic Compounds	0.06	0.25

5.1.21. The hourly quantity of natural gas that shall be consumed in the 10.44 MMBTU/hr De-Ethanizer Regen Gas Heater (7E) shall not exceed **11,263,10,237** standard cubic feet per hour.

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5.1.22. The annual quantity of natural gas that shall be consumed in the 10.44 MMBTU/hr De-Ethanizer Regen Gas Heater (7E) shall not exceed **45,2289,68** x 10<sup>6</sup> standard cubic feet per year.

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5.1.23. [Reserved]

5.1.24. No person shall cause, suffer, allow or permit emission of smoke and/or particulate matter into the open air from any fuel burning unit which is greater than ten (10) percent opacity based on a six minute block average.  
[45CSR§2-3.1.]

5.1.25. The permitted facility shall comply with all applicable provisions of 40CFR60 Subpart Dc, provided that compliance with any more stringent limitation set forth under this permit shall also be demonstrated. Recordkeeping and reporting requirements shall be conducted in accordance with §60.48c. These reports shall be submitted in accordance with the time lines and in the order set forth in §60.48c and submitted to the addresses listed in Section 3.5.3.

## 5.2. Monitoring Requirements

5.2.1. At such reasonable times as the Secretary may designate, the permittee shall conduct Method 9 emission observations for the purpose of demonstrating compliance with Section 5.1.24. Method 9 shall be conducted in accordance with 40 CFR 60 Appendix A.

## 5.3. Testing Requirements

5.3.1. Compliance with the visible emission requirements of section 5.1.24 shall be determined in accordance with 40 CFR Part 60, Appendix A, Method 9 or by using measurements from continuous opacity monitoring systems approved by the Director. The Director may require the installation, calibration, maintenance and operation of continuous opacity monitoring systems and may establish policies for the evaluation of continuous opacity monitoring results and the determination of compliance with the visible emission requirements of section 5.1.24. Continuous opacity monitors shall not be required on fuel burning units which employ wet scrubbing systems for emission control.  
[45CSR§2-3.2.]

## 5.4. Recordkeeping Requirements

5.4.1. To demonstrate compliance with sections 5.1.1-5.1.23, the permittee shall maintain a monthly record of the amount of natural gas consumed and the hours of operation of each of the heaters (1E-7E). Compliance with the maximum throughput limitation shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the monthly throughput at any given time during the previous twelve consecutive calendar months. Said records shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

5.4.2. Except as provided under paragraphs (g)(2) and (g)(3) of this section, the owner or operator of each affected facility shall record and maintain records of the amount of each fuel combusted during each operating day.  
[40CFR§60.48(c)(g)(1)]

- 5.4.3. As an alternative to meeting the requirements of paragraph (g)(1) of this section, the owner or operator of an affected facility that combusts only natural gas, wood, fuels using fuel certification in §60.48c(f) to demonstrate compliance with the SO<sub>2</sub> standard, fuels not subject to an emissions standard (excluding opacity), or a mixture of these fuels may elect to record and maintain records of the amount of each fuel combusted during each calendar month.  
[40CFR§60.48 (c)(g)(2)]
- 5.4.4. As an alternative to meeting the requirements of paragraph (g)(1) of this section, the owner or operator of an affected facility or multiple affected facilities located on a contiguous property unit where the only fuels combusted in any steam generating unit (including steam generating units not subject to this subpart) at that property are natural gas, wood, distillate oil meeting the most current requirements in §60.42C to use fuel certification to demonstrate compliance with the SO<sub>2</sub> standard, and/or fuels, excluding coal and residual oil, not subject to an emissions standard (excluding opacity) may elect to record and maintain records of the total amount of each steam generating unit fuel delivered to that property during each calendar month.  
[40CFR§60.48(c)(g)(3)]

## 5.5. Reporting Requirements

- 5.5.1. The owner or operator of each affected facility shall submit notification of the date of construction or reconstruction and actual startup, as provided by §60.7 of this part. This notification shall include:
1. The design heat input capacity of the affected facility and identification of fuels to be combusted in the affected facility.
  2. If applicable, a copy of any federally enforceable requirement that limits the annual capacity factor for any fuel or mixture of fuels under §60.42c, or §60.43c.
  3. The annual capacity factor at which the owner or operator anticipates operating the affected facility based on all fuels fired and based on each individual fuel fired.
  4. Notification if an emerging technology will be used for controlling SO<sub>2</sub> emissions. The Administrator will examine the description of the control device and will determine whether the technology qualifies as an emerging technology. In making this determination, the Administrator may require the owner or operator of the affected facility to submit additional information concerning the control device. The affected facility is subject to the provisions of §60.42c(a) or (b)(1), unless and until this determination is made by the Administrator.  
[40CFR§60.48c(a)]
- 5.5.2. The reporting period for the reports required under this subpart is each six-month period. All reports shall be submitted to the Administrator and shall be postmarked by the 30th day following the end of the reporting period.  
[40CFR§60.48c(j)]

**6.0. Source-Specific Requirements (Flare Control Device, 8E)**

**6.1. Limitations and Standards**

6.1.1. In accordance with information in permit application R13-3070A, the permittee shall install and operate a Process Flare (8S) designed to achieve, at a minimum, a 99.0% destruction and removal efficiency (DRE) of VOCs and organic HAPS from the sources identified under Control Devices Table 1.1. The maximum aggregate amount of waste gases sent to the Process Flare from these sources shall not exceed 630.19 MMscf/yr based on a rolling 12 month total.

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6.1.2. Maximum emissions from the Zeeco flare (8E) shall not exceed the following limits:

a. The maximum aggregate emissions generated at the Process Flare (8E) from the combustion of waste gases and the pilot light shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	641.06 638.12	73.27
Carbon Monoxide	1,279.80 1273.93	146.27 28

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b. The maximum emissions of VOCs and HAPs at the Process Flare (representing un-combusted pass-through organic vapors that are generated at one of the sources identified under 6.1.1.) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
VOCs	177.30	20.36
<i>Benzene</i>	4.49	0.52
<i>Ethylbenzene</i>	6.09	0.70
<i>n-Hexane</i>	5.48	0.63
<i>Toluene</i>	5.30	0.61
<i>2,2,4-TMP</i>	6.55	0.75
<i>Xylenes</i>	6.11	0.70
<b>Total HAPs</b>	34.38	3.95

6.1.3. The installed Process Flare (8S) shall be a Zeeco Model Number AFTA-24/80, shall have a maximum waste-gas capacity of 208,000 lb/hr, shall have an MDHI of 4,624 mmBtu/hr, and shall be designed and operated in accordance with the following:

- a. Flare shall be air-assisted.
- b. Flare shall be designed for and operated with no visible emissions, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

- c. Flare shall be operated, with a flame present at all times whenever emissions may be vented to ~~the~~ permit, except during SSM (Startup, Shutdown, Malfunctions) events.

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- d. A flare shall be used only where the net heating value of the gas being combusted is 11.2 MJ/scm (300 Btu/scf) or greater if the flare is steam-assisted or air-assisted; or where the net heating value of the gas being combusted is 7.45 MJ/scm (200 Btu/scf) or greater if the flares is non-assisted. The net heating value of the gas being combusted in a flare shall be calculated using the following equation:

$$H_T = K \sum_{i=1}^n C_i H_i$$

Where:

$H_T$ =Net heating value of the sample, MJ/scm; where the net enthalpy per mole of off gas is based on combustion at 25 °C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20 °C.

$K$ =Constant=

$$1.740 \times 10^{-7} \left( \frac{1}{ppmv} \right) \left( \frac{\text{g-mole}}{\text{scm}} \right) \left( \frac{\text{MJ}}{\text{kcal}} \right)$$

where the standard temperature for (g-mole/scm) is 20 °C.

$C_i$ =Concentration of sample component  $i$  in ppmv on a wet basis, which may be measured for organics by Test Method 18, but is not required to be measured using Method 18 (unless designated by the Director).

$H_i$ =Net heat of combustion of sample component  $i$ , kcal/g-mole at 25 °C and 760 mm Hg. The heats of combustion may be determined using ASTM D2382-76 or 88 or D4809-95 if published values are not available or cannot be calculated.

$n$ =Number of sample components.

- e. Air-assisted flares shall be designed and operated with an exit velocity less than the velocity  $V_{max}$ . The maximum permitted velocity,  $V_{max}$ , for air-assisted flares shall be determined by the following equation:

$$V_{max} = 8.71 + 0.708(H_T)$$

Where:

$V_{max}$ =Maximum permitted velocity, m/sec.

8.71=Constant.

0.708=Constant.

$H_T$ =The net heating value as determined in 6.1.3.d.

- 6.1.4. The permittee is not required to conduct a flare compliance assessment for concentration of sample (i.e. Method 18) and tip velocity (i.e. Method 2) until such time as the Director requests a flare compliance assessment to be conducted in accordance with section 6.3.2, but the permittee is required to conduct a flare design evaluation in accordance with section 6.4.2. Alternatively, the permittee may elect to demonstrate compliance with the flare design criteria requirements of section 6.1.3 by complying with the compliance assessment testing requirements of section 6.3.2.

## 6.2. Monitoring Requirements

- 6.2.1. In order to demonstrate compliance with the requirements of 6.1.3.c, the permittee shall monitor the presence or absence of a flare pilot flame using a thermocouple or any other equivalent device, except during SSM events.
- 6.2.2. In order to determine compliance with the requirements of 6.1.1, the permittee shall monitor and record the monthly and rolling twelve (12) month total aggregate waste gases, pilot gas, and purge gas sent to the flare (in MMscf) from the sources identified under Control Devices Table 1.1.

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### 6.3. Testing Requirements

- 6.3.1. In order to demonstrate compliance with the flare opacity requirements of 6.1.3.b the permittee shall conduct a Method 22 opacity test for at least two hours. This test shall demonstrate no visible emissions are observed for more than a total of 5 minutes during any 2 consecutive hour period using 40CFR60 Appendix A Method 22. The permittee shall conduct this test within one (1) year of R13-3070 permit issuance or initial startup whichever is later. The visible emission checks shall determine the presence or absence of visible emissions. At a minimum, the observer must be trained and knowledgeable regarding the effects of background contrast, ambient lighting, observer position relative to lighting, wind, and the presence of uncombined water (condensing water vapor) on the visibility of emissions. This training may be obtained from written materials found in the References 1 and 2 from 40 CFR part 60, appendix A, Method 22 or from the lecture portion of 40 CFR part 60, appendix A, Method 9 certification course.
- 6.3.2. The Director may require the permittee to conduct a flare compliance assessment to demonstrate compliance with section 6.1.5. This compliance assessment testing shall be conducted in accordance with appropriate test methods or other equivalent testing as approved in writing by the Director.

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### 6.4. Recordkeeping Requirements

- 6.4.1. For the purpose of demonstrating compliance with section 6.1.3.c and 6.2.1, the permittee shall maintain records of the times and duration of all periods which the pilot flame was absent.
- 6.4.2. For the purpose of demonstrating compliance with section 6.1.3 and 6.3.2, the permittee shall maintain a record of the flare design evaluation. The flare design evaluation shall include, net heat value calculations, exit (tip) velocity calculations, and all supporting concentration calculations and other related information requested by the Director.
- 6.4.3. For the purpose of demonstrating compliance with the requirements set forth in sections 6.1.3, the permittee shall maintain records of testing conducted in accordance with 6.3.2.
- 6.4.4. The permittee shall document and maintain the corresponding records specified by the on-going monitoring requirements of 6.2 and testing requirements of 6.3.
- 6.4.5. For the purpose of demonstrating compliance with section 6.1.3.b, the permittee shall maintain records of the visible emission opacity tests conducted per Section 6.3.1.
- 6.4.6. All records required under Section 6.3 shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

### 6.5. Reporting Requirements

- 6.5.1. If permittee is required by the Director to demonstrate compliance with section 6.3.2, then the permittee shall submit a testing protocol at least thirty (30) days prior to testing and shall submit a notification of the testing date at least fifteen (15) days prior to testing. The permittee shall submit the testing results within sixty (60) days of testing and provide all supporting calculations and testing data.
- 6.5.2. Any deviation(s) from the allowable visible emission requirement for any emission source discovered during observations using 40CFR Part 60, Appendix A, Method 9 or 22 shall be reported in writing to the Director of the Division of Air Quality as soon as practicable, but in any case within ten (10) calendar days of the occurrence and shall include at least the following

information: the results of the visible determination of opacity of emissions, the cause or suspected cause of the violation(s), and any corrective measures taken or planned.

- 6.5.3. Any deviation(s) from the flare design and operation criteria in Section 6.1.3 shall be reported in writing to the Director of the Division of Air Quality as soon as practicable, but in any case within ten (10) calendar days of discovery of such deviation.

**7.0. Source-Specific Requirements (Standby Generator, 9E)**

**7.1. Limitations and Standards**

- 7.1.1. To demonstrate compliance with Section 7.1.2, the quantity of natural gas that shall be consumed in the 224 hp liquid propane gas (LPG)-fired reciprocating engine, an Olympian Model G150LG2 (9E), shall not exceed 878 cubic feet per hour and 440,000 cubic feet per year.
- 7.1.2. Maximum emissions from the 224 hp LPG-fired reciprocating engine, an Olympian Model G150LG2 (9E), shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	0.99	0.25
Carbon Monoxide	1.98	0.49
Volatile Organic Compounds	0.54	0.13
Formaldehyde	0.04	0.01

- 7.1.3. **Maximum Yearly Operation Limitation.** The maximum yearly hours of operation for the 224 hp LPG-fired reciprocating engine, an Olympian Model G150LG2 (9E), shall not exceed 500 hours per year. Compliance with the Maximum Yearly Operation Limitation shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the hours of operation at any given time during the previous twelve consecutive calendar months.

**Comment [WK1]:** Although the engine's PTE is based on 500 hours per year, because the engine is used only during emergencies, per NSPS JJJ, operation during emergencies is unlimited. NSPS JJJ allows for up to 100 hours per year operation for non-emergency situations but there is no time limit on the use of emergency stationary ICE in emergency situations. This condition needs to be reworded to reflect the above language.

**7.2. Recordkeeping Requirements**

- 7.2.1. To demonstrate compliance with sections 7.1.1-7.1.3, the permittee shall maintain records of the hours of operation of the engine (9E). Said records shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

## 8.0. Source-Specific Requirements (40CFR60 Subpart JJJJ Requirements, Standby Generator, 9E)

### 8.1. Limitations and Standards

8.1.1. ~~Owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 75 KW (100 HP) (except stationary non-emergency SI 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. For owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 100 HP (except stationary non-emergency gasoline and rich burn engines that use LPG) manufactured prior to January 1, 2011 that were certified to the certification emission standards in 40 CFR part 1048 applicable to engines that are not severe duty engines, if such stationary SI ICE was certified to a carbon monoxide (CO) standard above the standard in Table 1 to this subpart, then the owners and operators may meet the CO certification (not field testing) standard for which the engine was certified. Owners and operators of stationary SI ICE with a maximum engine power greater than 19 KW (25 HP) manufactured on or after the applicable date in §60.4230(a)(4) that are rich burn engines that use LPG must comply with the emission standards in §60.4231(e) for their stationary SI ICE. [40CFR§60.4233(eg)]~~

8.1.2. ~~Stationary SI internal combustion engine manufacturers must certify their stationary SI ICE with a maximum engine power greater than 19 KW (25 HP) (except emergency stationary ICE with a maximum engine power greater than 25 HP and less than 130 HP) that are rich burn engines that use LPG and that are manufactured on or after the applicable date in §60.4230(a)(2), or manufactured on or after the applicable date in §60.4230(a)(4) for emergency stationary ICE with a maximum engine power greater than or equal to 130 HP, to the certification emission standards and other requirements for new nonroad SI engines in 40 CFR part 1048. Stationary SI internal combustion engine manufacturers must certify their emergency stationary SI ICE greater than 25 HP and less than 130 HP that are rich burn engines that use LPG and that are manufactured on or after the applicable date in §60.4230(a)(4) to the Phase I emission standards in 40 CFR 90.103, applicable to class II engines, and other requirements for new nonroad SI engines in 40 CFR part 90. Stationary SI internal combustion engine manufacturers may certify their stationary SI ICE with a maximum engine power less than or equal to 30 KW (40 HP) with a total displacement less than or equal to 1,000 cc that are rich burn engines that use LPG to the certification emission standards and other requirements for new nonroad SI engines in 40 CFR part 90 or 1054, as appropriate. [40CFR§60.4231(e)]~~

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**9.0. Source-Specific Requirements (Gas Processing Plant, 40CFR60 Subpart OOOO Requirements: Piping and Equipment Fugitives (15E) & Reciprocating Compressors Engine (17E))**

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**9.1. Limitations and Standards**

9.1.1. **Maximum Throughput Limitation.** The total maximum wet natural gas throughput through the Gas Processing Plant shall not exceed 660 mmscf/day.

9.1.2. You must comply with the standards in paragraphs (a) through (d) of this section for each reciprocating compressor affected facility.

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

1. 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.

2. 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.

b. You must demonstrate initial compliance with standards that apply to reciprocating compressor affected facilities as required by § 60.5410.

c. You must demonstrate continuous compliance with standards that apply to reciprocating compressor affected facilities as required by § 60.5415.

d. You must perform the required notification, recordkeeping, and reporting as required by § 60.5420.

[40CFR§60.5385, Reciprocating Compressor Engines (9E17E)]

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9.1.3. What equipment leak standards apply to affected facilities at an onshore natural gas processing plant?

This section applies to the group of all equipment, except compressors, within a process unit.

a. You must comply with the requirements of §§ 60.482-1a(a), (b), and (d), 60.482-2a, and 60.482-4a through 60.482-11a, except as provided in § 60.5401.

b. You may elect to comply with the requirements of §§ 60.483-1a and 60.483-2a, as an alternative.

c. You may apply to the Administrator for permission to use an alternative means of emission limitation that achieves a reduction in emissions of VOC at least equivalent to that achieved by the controls required in this subpart according to the requirements of § 60.5402 of this subpart.

d. You must comply with the provisions of § 60.485a of this part except as provided in paragraph (f) of this section.

e. You must comply with the provisions of §§ 60.486a and 60.487a of this part except as provided in §§ 60.5401, 60.5421, and 60.5422 of this part.

- f. You must use the following provision instead of § 60.485a(d)(1): Each piece of equipment is presumed to be in VOC service or in wet gas service unless an owner or operator demonstrates that the piece of equipment is not in VOC service or in wet gas service. For a piece of equipment to be considered not in VOC service, it must be determined that the VOC content can be reasonably expected never to exceed 10.0 percent by weight. For a piece of equipment to be considered in wet gas service, it must be determined that it contains or contacts the field gas before the extraction step in the process. For purposes of determining the percent VOC content of the process fluid that is contained in or contacts a piece of equipment, procedures that conform to the methods described in ASTM E169-93, E168-92, or E260-96 (incorporated by reference as specified in § 60.17) must be used.  
**[40CFR§60.5400, Onshore Natural Gas Processing Plant]**
- 9.1.4. What are the exceptions to the equipment leak standards for affected facilities at onshore natural gas processing plants?
- a. You may comply with the following exceptions to the provisions of § 60.5400(a) and (b).
- b. 1. Each pressure relief device in gas/vapor service may be monitored quarterly and within 5 days after each pressure release to detect leaks by the methods specified in § 60.485a(b) except as provided in § 60.5400(c) and in paragraph (b)(4) of this section, and § 60.482-4a(a) through (c) of subpart VVa.
2. If an instrument reading of 500 ppm or greater is measured, a leak is detected.
3. i. When a leak is detected, it must be repaired as soon as practicable, but no later than 15 calendar days after it is detected, except as provided in § 60.482-9a.
- ii. A first attempt at repair must be made no later than 5 calendar days after each leak is detected.
4. i. Any pressure relief device that is located in a nonfractionating plant that is monitored only by non-plant personnel may be monitored after a pressure release the next time the monitoring personnel are on-site, instead of within 5 days as specified in paragraph (b)(1) of this section and § 60.482-4a(b)(1) of subpart VVa.
- ii. No pressure relief device described in paragraph (b)(4)(i) of this section must be allowed to operate for more than 30 days after a pressure release without monitoring.
- a. Sampling connection systems are exempt from the requirements of § 60.482-5a.
- b. Pumps in light liquid service, valves in gas/vapor and light liquid service, and pressure relief devices in gas/vapor service that are located at a nonfractionating plant that does not have the design capacity to process 283,200 standard cubic meters per day (scmd) (10 million standard cubic feet per day) or more of field gas are exempt from the routine monitoring requirements of §§ 60.482-2a(a)(1) and 60.482-7a(a), and paragraph (b)(1) of this section.
- c. Pumps in light liquid service, valves in gas/vapor and light liquid service, and pressure relief devices in gas/vapor service within a process unit that is located in the Alaskan North Slope are exempt from the routine monitoring requirements of §§ 60.482-2a(a)(1), 60.482-7a(a), and paragraph (b)(1) of this section.
- d. An owner or operator may use the following provisions instead of § 60.485a(e):
1. Equipment is in heavy liquid service if the weight percent evaporated is 10 percent or less at 150 °C (302 °F) as determined by ASTM Method D86-96 (incorporated by reference as specified in § 60.17).

2. Equipment is in light liquid service if the weight percent evaporated is greater than 10 percent at 150 °C (302 °F) as determined by ASTM Method D86-96 (incorporated by reference as specified in § 60.17).
- e. An owner or operator may use the following provisions instead of § 60.485a(b)(2): A calibration drift assessment shall be performed, at a minimum, at the end of each monitoring day. Check the instrument using the same calibration gas(es) that were used to calibrate the instrument before use. Follow the procedures specified in Method 21 of appendix A-7 of this part, Section 10.1, except do not adjust the meter readout to correspond to the calibration gas value. Record the instrument reading for each scale used as specified in § 60.486a(e)(8). Divide these readings by the initial calibration values for each scale and multiply by 100 to express the calibration drift as a percentage. If any calibration drift assessment shows a negative drift of more than 10 percent from the initial calibration value, then all equipment monitored since the last calibration with instrument readings below the appropriate leak definition and above the leak definition multiplied by (100 minus the percent of negative drift/divided by 100) must be re-monitored. If any calibration drift assessment shows a positive drift of more than 10 percent from the initial calibration value, then, at the owner/operator's discretion, all equipment since the last calibration with instrument readings above the appropriate leak definition and below the leak definition multiplied by (100 plus the percent of positive drift/divided by 100) may be re-monitored.

[40CFR§60.5401, Onshore Natural Gas Processing Plant]

9.1.5. What are the alternative emission limitations for equipment leaks from onshore natural gas processing plants?

- a. If, in the Administrator's judgment, an alternative means of emission limitation will achieve a reduction in VOC emissions at least equivalent to the reduction in VOC emissions achieved under any design, equipment, work practice or operational standard, the Administrator will publish, in the Federal Register, a notice permitting the use of that alternative means for the purpose of compliance with that standard. The notice may condition permission on requirements related to the operation and maintenance of the alternative means.
- b. Any notice under paragraph (a) of this section must be published only after notice and an opportunity for a public hearing.
- c. The Administrator will consider applications under this section from either owners or operators of affected facilities, or manufacturers of control equipment.
- d. The Administrator will treat applications under this section according to the following criteria, except in cases where the Administrator concludes that other criteria are appropriate:
  1. The applicant must collect, verify and submit test data, covering a period of at least 12 months, necessary to support the finding in paragraph (a) of this section.
  2. If the applicant is an owner or operator of an affected facility, the applicant must commit in writing to operate and maintain the alternative means so as to achieve a reduction in VOC emissions at least equivalent to the reduction in VOC emissions achieved under the design, equipment, work practice or operational standard.

[40CFR§60.5402, Onshore Natural Gas Processing Plant]

## 9.2. Initial Compliance Demonstration

- 9.2.1. You must determine initial compliance with the standards for each affected facility using the requirements in paragraph (c) and (f) of this section. The initial compliance period begins on October 15, 2012 or upon initial startup, whichever is later, and ends no later than one year after the initial startup date for your affected facility or no later than one year after October 15, 2012. The initial compliance period may be less than one full year.

- c. To achieve initial compliance with the standards for each reciprocating compressor affected facility you must comply with paragraphs (c)(1) through (4) of this section.
  - 1. During the initial compliance period, you must continuously monitor the number of hours of operation or track the number of months since the last rod packing replacement.
  - 2. You must submit the notifications required in 60.7(a)(1), (3), and (4).
  - 3. You must submit the initial annual report for your reciprocating compressor as required in § 60.5420(b).
  - 4. You must maintain the records as specified in § 60.5420(c)(3) for each reciprocating compressor affected facility.
- f. For affected facilities at onshore natural gas processing plants, initial compliance with the VOC requirements is demonstrated if you are in compliance with the requirements of § 60.5400.

[40CFR§60.5410, Reciprocating ~~Compressor Engines (9E17E)~~, Onshore Natural Gas Processing Plant]

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### 9.3. Continuous Compliance Demonstration

- 9.3.1. For each reciprocating compressor affected facility, you must demonstrate continuous compliance according to paragraphs (1) through (3) of this section.
  - 1. You must continuously monitor the number of hours of operation for each reciprocating compressor affected facility or track the number of months since initial startup, or October 15, 2012, or the date of the most recent reciprocating compressor rod packing replacement, whichever is later.
  - 2. You must submit the annual report as required in § 60.5420(b) and maintain records as required in § 60.5420(c)(3).
  - 3. You must replace the reciprocating compressor rod packing before the total number of hours of operation reaches 26,000 hours or the number of months since the most recent rod packing replacement reaches 36 months.
- 9.3.2. For affected facilities at onshore natural gas processing plants, continuous compliance with VOC requirements is demonstrated if you are in compliance with the requirements of § 60.5400.
- 9.3.3. Affirmative defense for violations of emission standards during malfunction. In response to an action to enforce the standards set forth in §§ 60.5375, you may assert an affirmative defense to a claim for civil penalties for violations of such standards that are caused by malfunction, as defined at § 60.2. Appropriate penalties may be assessed, however, if you fail to meet your burden of proving all of the requirements in the affirmative defense. The affirmative defense shall not be available for claims for injunctive relief.

(1) To establish the affirmative defense in any action to enforce such a standard, you must timely meet the reporting requirements in § 60.5420(a), and must prove by a preponderance of evidence that:

(i) The violation:

(A) Was caused by a sudden, infrequent, and unavoidable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner; and

(B) Could not have been prevented through careful planning, proper design or better

(C) Did not stem from any activity or event that could have been foreseen and avoided, or planned for; and

(D) Was not part of a recurring pattern indicative of inadequate design, operation, or maintenance; and

(ii) Repairs were made as expeditiously as possible when a violation occurred. Off-shift and overtime labor were used, to the extent practicable to make these repairs; and

(iii) The frequency, amount and duration of the violation (including any bypass) were minimized to the maximum extent practicable; and

(iv) If the violation resulted from a bypass of control equipment or a process, then the bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; and

(v) All possible steps were taken to minimize the impact of the violation on ambient air quality, the environment and human health; and

(vi) All emissions monitoring and control systems were kept in operation if at all possible, consistent with safety and good air pollution control practices; and

(vii) All of the actions in response to the violation were documented by properly signed, contemporaneous operating logs; and

(viii) At all times, the affected source was operated in a manner consistent with good practices for minimizing emissions; and

(ix) A written root cause analysis has been prepared, the purpose of which is to determine, correct, and eliminate the primary causes of the malfunction and the violation resulting from the malfunction event at issue. The analysis shall also specify, using best monitoring methods and engineering judgment, the amount of any emissions that were the result of the malfunction.

(2) Report. The owner or operator seeking to assert an affirmative defense shall submit a written report to the Administrator with all necessary supporting documentation, that it has met the requirements set forth in paragraph (h)(1) of this section. This affirmative defense report shall be included in the first periodic compliance, deviation report or excess emission report otherwise required after the initial occurrence of the violation of the relevant standard (which may be the end of any applicable averaging period). If such compliance, deviation report or excess emission report is due less than 45 days after the initial occurrence of the violation, the affirmative defense report may be included in the second compliance, deviation report or excess emission report due after the initial occurrence of the violation of the relevant standard.  
[40CFR§60.5415]

#### 9.4. Notification, Recordkeeping and Reporting Requirements

9.4.1. You must submit the notifications required in § 60.7(a)(1) and (4), and according to paragraphs (a)(1) and (2) of this section, if you own or operate one or more of the affected facilities specified in § 60.5365 that was constructed, modified, or reconstructed during the reporting period.

(1) If you own or operate a gas well, pneumatic controller or storage vessel affected facility you are not required to submit the notifications required in § 60.7(a)(1), (3), and (4).

(2) (i) If you own or operate a gas well affected facility, you must submit a notification to the Administrator no later than 2 days prior to the commencement of each well completion operation listing the anticipated date of the well completion operation. The notification shall include contact information for the owner or operator; the API well number, the latitude and

longitude coordinates for each well in decimal degrees to an accuracy and precision of five (5) decimals of a degree using the North American Datum of 1983; and the planned date of the beginning of flowback. You may submit the notification in writing or in electronic format.

(ii) If you are subject to state regulations that require advance notification of well completions and you have met those notification requirements, then you are considered to have met the advance notification requirements of paragraph (a)(2)(i) of this section.

9.4.2. Reporting requirements. You must submit annual reports containing the information specified in paragraphs (b)(1) and (b)(4) of this section to the Administrator and performance test reports as specified in paragraph (b)(7) of this section. The initial annual report is due 30 days after the end of the initial compliance period as determined according to § 60.5410. Subsequent annual reports are due on the same date each year as the initial annual report. If you own or operate more than one affected facility, you may submit one report for multiple affected facilities provided the report contains all of the information required as specified in paragraphs (b)(1) through (6) of this section. Annual reports may coincide with title V reports as long as all the required elements of the annual report are included. You may arrange with the Administrator a common schedule on which reports required by this part may be submitted as long as the schedule does not extend the reporting period.

(1) The general information specified in paragraphs (b)(1)(i) through (iv) of this section.

(i) The company name and address of the affected facility.

(ii) An identification of each affected facility being included in the annual report.

(iii) Beginning and ending dates of the reporting period.

(iv) A certification by a responsible official of truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

(4) For each reciprocating compressor affected facility, the information specified in paragraphs (b)(4)(i) through (ii) of this section.

(i) The cumulative number of hours of operation or the number of months since initial startup, October 15, 2012, or since the previous reciprocating compressor rod packing replacement, whichever is later.

(ii) Records of deviations specified in paragraph (c)(3)(iii) of this section that occurred during the reporting period.

(7) (i) Within 60 days after the date of completing each performance test (see § 60.8 of this part) as required by this subpart you must submit the results of the performance tests required by this subpart to EPA's WebFIRE database by using the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) ([www.epa.gov/cdx](http://www.epa.gov/cdx)). Performance test data must be submitted in the file format generated through use of EPA's Electronic Reporting Tool (ERT) (see <http://www.epa.gov/ttn/chief/ert/index.html>). Only data collected using test methods on the ERT Web site are subject to this requirement for submitting reports electronically to WebFIRE. Owners or operators who claim that some of the information being submitted for performance tests is confidential business information (CBI) must submit a complete ERT file including information claimed to be CBI on a compact disk or other commonly used electronic storage media (including, but not limited to, flash drives) to EPA. The electronic media must be clearly marked as CBI and mailed to U.S. EPA/OAPQS/CORE CBI Office, Attention: WebFIRE Administrator, MD C404-02, 4930 Old Page Rd., Durham, NC 27703. The same ERT file with the CBI omitted must be submitted to EPA via CDX as described earlier in this paragraph. At the discretion of the delegated authority, you must also submit

these reports, including the confidential business information, to the delegated authority in the format specified by the delegated authority.

(ii) All reports required by this subpart not subject to the requirements in paragraph (a)(2)(i) of this section must be sent to the Administrator at the appropriate address listed in § 63.13 of this part. The Administrator or the delegated authority may request a report in any form suitable for the specific case (e.g., by commonly used electronic media such as Excel spreadsheet, on CD or hard copy). The Administrator retains the right to require submittal of reports subject to paragraph (a)(2)(i) and (ii) of this section in paper format.

9.4.3. Recordkeeping requirements. You must maintain the records identified as specified in § 60.7(f) and in paragraph (c)(3) of this section. All records must be maintained for at least 5 years.

(3) For each reciprocating compressors affected facility, you must maintain the records in paragraphs (c)(3)(i) through (iii) of this section.

(i) Records of the cumulative number of hours of operation or number of months since initial startup or October 15, 2012, or the previous replacement of the reciprocating compressor rod packing, whichever is later.

(ii) Records of the date and time of each reciprocating compressor rod packing lacement.

(iii) Records of deviations in cases where the reciprocating compressor was not operated in compliance with the requirements specified in § 60.5385.

[40CFR§60.5420]

9.4.4. What are my additional recordkeeping requirements for my affected facility subject to VOC requirements for onshore natural gas processing plants?

a. You must comply with the requirements of paragraph (b) of this section in addition to the requirements of § 60.486a.

b. The following recordkeeping requirements apply to pressure relief devices subject to the requirements of § 60.5401(b)(1) of this subpart.

1. When each leak is detected as specified in § 60.5401(b)(2), a weatherproof and readily visible identification, marked with the equipment identification number, must be attached to the leaking equipment. The identification on the pressure relief device may be removed after it has been repaired.
2. When each leak is detected as specified in § 60.5401(b)(2), the following information must be recorded in a log and shall be kept for 2 years in a readily accessible location:
  - i. The instrument and operator identification numbers and the equipment identification number.
  - ii. The date the leak was detected and the dates of each attempt to repair the leak.
  - iii. Repair methods applied in each attempt to repair the leak.
  - iv. "Above 500 ppm" if the maximum instrument reading measured by the methods specified in paragraph (a) of this section after each repair attempt is 500 ppm or greater.
  - v. "Repair delayed" and the reason for the delay if a leak is not repaired within 15 calendar days after discovery of the leak.
  - vi. The signature of the owner or operator (or designate) whose decision it was that repair could not be effected without a process shutdown.

- vii. The expected date of successful repair of the leak if a leak is not repaired within 15 days.
- viii. Dates of process unit shutdowns that occur while the equipment is unrepaired.
- ix. The date of successful repair of the leak.
- x. A list of identification numbers for equipment that are designated for no detectable emissions under the provisions of § 60.482-4a(a). The designation of equipment subject to the provisions of § 60.482-4a(a) must be signed by the owner or operator.

**[40CFR§60.5421, Onshore Natural Gas Processing Plant]**

9.4.5. What are my additional reporting requirements for my affected facility subject to VOC requirements for onshore natural gas processing plants?

- a. You must comply with the requirements of paragraphs (b) and (c) of this section in addition to the requirements of § 60.487a(a), (b), (c)(2)(i) through (iv), and (c)(2)(vii) through (viii).
- b. An owner or operator must include the following information in the initial semiannual report in addition to the information required in § 60.487a(b)(1) through (4): Number of pressure relief devices subject to the requirements of § 60.5401(b) except for those pressure relief devices designated for no detectable emissions under the provisions of § 60.482-4a(a) and those pressure relief devices complying with § 60.482-4a(c).
- c. An owner or operator must include the following information in all semiannual reports in addition to the information required in § 60.487a(c)(2)(i) through (vi):
  - 1. Number of pressure relief devices for which leaks were detected as required in § 60.5401(b)(2); and
  - 2. Number of pressure relief devices for which leaks were not repaired as required in § 60.5401(b)(3).

**[40CFR§60.5422, Onshore Natural Gas Processing Plant]**

**9.5. Recordkeeping Requirements**

- 9.5.1. To demonstrate compliance with section 9.1.1 the permittee shall maintain records of the amount of natural gas processed in the Gas Processing Plant. Said records required shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

### 10.0. Source-Specific Hazardous Air Pollutant Requirements (Amine Process Vent, 16E)

#### 10.1. Limitations and Standards

- 10.1.1. **Maximum Throughput Limitation.** The maximum ethane feedstock to the amine system shall not exceed 44,000 barrels/day.
- 10.1.2. The amine system (16E) shall be designed and operated in accordance with the following:
  - a. Carbon dioxide will be removed from the ethane product in an amine contacting system.
  - b. The total ethane product shall be contacted with a diethylamide (DEA) amine solution in the Amine Contactor where the carbon dioxide in the ethane product is removed.
  - c. The rich amine from the Contactor is regenerated in the Amine Regenerator where heat input is used to drive the carbon dioxide and water overhead and vented to the atmosphere.
  - d. The lean amine from the bottom of the Regenerator is recycled back to the Amine Contactor.
- 10.1.3. Maximum emissions from the Amine System (16E) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Volatile Organic Compounds	0.11	0.49

#### 10.2. Monitoring Requirements

- 10.2.1. The permittee shall monitor the throughput of ethane feedstock fed to the Amine Process (16E) on a monthly basis.

#### 10.3. Recordkeeping Requirements

- 10.3.1. The permittee shall maintain a record of the ethane product feedstock throughput to the Amine Process Vent (16E) to demonstrate compliance with section 10.1.1 of this permit. Said records shall be maintained for a period of five (5) years on site or in a readily accessible off-site location maintained by the permittee. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

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## 11.0. Source-Specific Requirements (Truck Loadout, 14E)

### 11.1. Limitations and Standards

11.1.1. The maximum quantity of slop oil (condensate) that shall be loaded (14E) shall not exceed 4,000,000 gallons per year.

11.1.2. The Truck Loadout (14E) shall be operated in accordance with the plans and specifications filed in Permit Application R13-3070A unless the changes reduce emissions or do not meet the definition of a modification in 45CFR 13.

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### 11.2. Recordkeeping Requirements

11.2.1. For the purpose of demonstrating compliance with section 11.1.1, the permittee shall maintain records of the amount of slop oil (condensate) loaded from the Truck Loadout (14E).

11.2.2. All records required under Section 11.2 shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

**12.0. Source-Specific Requirements (Storage Tanks, 10E-13E)**

**12.1. Limitations and Standards**

12.1.1. The maximum throughput to the storage tanks (10E-13E) shall not exceed the following:

<b>Emission Point ID#</b>	<b>Emission Unit Description</b>	<b>Maximum Annual Throughput (gallons/year)</b>
10E	Slop Oil (Condensate) Tank (00-ST-826)	1,000,000
11E	Slop Oil (Condensate) Tank (00-ST-827)	1,000,000
12E	Slop Oil (Condensate) Tank (00-ST-844)	1,000,000
13E	Slop Oil (Condensate) Tank (00-ST-845)	1,000,000

**12.2. Recordkeeping Requirements**

- 12.2.1. For the purpose of demonstrating compliance with section 12.1.1, the permittee shall maintain records of the maximum tank throughput of the storage tanks (10E-13E)
- 12.2.2. All records required under Section 12.2 shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

**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<sup>1</sup> \_\_\_\_\_  
(please use blue ink) Responsible Official or Authorized Representative Date

Name & Title \_\_\_\_\_  
(please print or type) Name Title

Telephone No. \_\_\_\_\_ Fax No. \_\_\_\_\_

<sup>1</sup> 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 U.S. EPA); or
- d. The designated representative delegated with such authority and approved in advance by the Director.

**Kessler, Joseph R**

---

**From:** Kessler, Joseph R  
**Sent:** Thursday, November 19, 2015 9:32 AM  
**To:** danell.zawaski@williams.com; don.wicburg@williams.com  
**Subject:** WV DAQ NSR Permit Application Complete for Williams Ohio Valley Midstream LLC: Oak Grove Natural Gas Processing Facility

**RE: Application Status: Complete**  
**Williams Ohio Valley Midstream LLC**  
**Oak Grove Natural Gas Processing Facility**  
**Permit Application: R13-3070A**  
**Plant ID No.: 051-00157**

*Entire Document*  
**NON-CONFIDENTIAL**

Mr. Wicburg,

Your application for a modification permit was received by the Division of Air Quality (DAQ) on January 13, 2015 and assigned to Mr. Ed Andrews. On April 15, 2015, an incomplete letter was sent to you requesting more information. On June 15, the permit application was reassigned to writer for review. Pursuant to §45-13-5.9, the application has, of the date of this e-mail, been deemed complete. Therefore, the 90-day statutory review period commenced on that date.

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](mailto:Joseph.r.kessler@wv.gov)

## Kessler, Joseph R

---

**From:** Adkins, Sandra K  
**Sent:** Thursday, September 17, 2015 11:43 AM  
**To:** Kessler, Joseph R  
**Subject:** FW: Williams Ohio Valley Midstream (Oak Grove Plant)/Permit Application Fee

I believe this is what you need.

**From:** Adkins, Sandra K  
**Sent:** Monday, February 02, 2015 10:16 AM  
**To:** Andrews, Edward S <[Edward.S.Andrews@wv.gov](mailto:Edward.S.Andrews@wv.gov)>  
**Subject:** Williams Ohio Valley Midstream (Oak Grove Plant)/Permit Application Fee

This is the receipt for payment received from:

Williams Field Services Group Inc, check number 4000097502, dated January 22, 2015, \$2,000.00  
Williams Ohio Valley Midstream Oak Grove Plant R13-3070A id no 051-00157

OASIS Deposit No CR 1500084698 February 2, 2015

# 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.

<a href="#"><u>WorkforceWV</u></a>	<a href="#"><u>Unemployment Compensation</u></a>	<a href="#"><u>Offices of the Insurance Commissioner</u></a>
------------------------------------	--	--

# 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.

<a href="#"><u>WorkforceWV</u></a>	<a href="#"><u>Unemployment Compensation</u></a>	<a href="#"><u>Offices of the Insurance Commissioner</u></a>
------------------------------------	--	--

**Kessler, Joseph R**

---

**From:** Zawaski, Danell <Danell.Zawaski@williams.com>  
**Sent:** Tuesday, November 17, 2015 3:26 PM  
**To:** Kessler, Joseph R  
**Subject:** FW: Oak Grove - Subpart OOOO  
**Attachments:** 000 - Att-Na (Ha-glJKLMP) - Oak Grove GP - NSR-45CSR13 - PTE - 11.12.14 (Update EmGen).pdf

As requested.

*R. Danell Zawaski, PE*

Environmental Specialist  
NEGP Environmental Services  
304-843-3133 Moundsville  
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412/787-6002 fax  
[Danell.zawaski@williams.com](mailto:Danell.zawaski@williams.com)

I.D. No. 051-000157 Reg. 30704  
Company DVM  
Facility OAK GROVE Region \_\_\_\_\_  
Initials DZ

**From:** Walter Konkel [mailto:wkonkel@elogicllc.com]  
**Sent:** Thursday, November 12, 2015 1:19 PM  
**To:** Zawaski, Danell <Danell.Zawaski@williams.com>  
**Subject:** RE: Oak Grove - Subpart OOOO

The updated engine calculation sheet for Attachment N is attached.

Walter Konkel  
EcoLogic Environmental Consultants, LLC  
(805) 964-7597 (office)  
(805) 284-4430 (mobile)  
[wkonkel@elogicllc.com](mailto:wkonkel@elogicllc.com)

*Entire Document*  
**NON-CONFIDENTIAL**

---

**From:** Zawaski, Danell [mailto:[Danell.Zawaski@williams.com](mailto:Danell.Zawaski@williams.com)]  
**Sent:** Thursday, November 12, 2015 10:10 AM  
**To:** Walter Konkel  
**Subject:** FW: Oak Grove - Subpart OOOO

*R. Danell Zawaski, PE*

Environmental Specialist  
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[Danell.zawaski@williams.com](mailto:Danell.zawaski@williams.com)

**From:** Kessler, Joseph R [mailto:[Joseph.R.Kessler@wv.gov](mailto:Joseph.R.Kessler@wv.gov)]  
**Sent:** Thursday, November 12, 2015 1:07 PM

**To:** Zawaski, Danell <[Danell.Zawaski@williams.com](mailto:Danell.Zawaski@williams.com)>

**Subject:** RE: Oak Grove - Subpart OOOO

OK, I will just update the Section 7 CO limit on the engine to 3.3 g/bhp-hr (1.63 lb/hr). Please correct the standby engine calculation page in Attachment N and send it to me (e-mail is fine).

Joe

---

**From:** Zawaski, Danell [<mailto:Danell.Zawaski@williams.com>]

**Sent:** Thursday, November 12, 2015 10:44 AM

**To:** Kessler, Joseph R

**Subject:** FW: Oak Grove - Subpart OOOO

See Walter's response.

*R. Danell Zawaski, PE*

Environmental Specialist

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[Danell.zawaski@williams.com](mailto:Danell.zawaski@williams.com)

**From:** Walter Konkel [<mailto:wkonkel@elogicllc.com>]

**Sent:** Thursday, November 12, 2015 10:35 AM

**To:** Zawaski, Danell <[Danell.Zawaski@williams.com](mailto:Danell.Zawaski@williams.com)>

**Subject:** RE: Oak Grove - Subpart OOOO

I reviewed the NSPS JJJJ emission standards again that are applicable to the Oak Grove emergency generator engine, including the link Joe provided. In summary, I now agree with Joe that the applicable emission standards for the 4SRB LPG fired emergency generator engine are found in 40 CFR Part 1048 [see §1048.101(a)(2)] .

The applicable emission standards are: HC + NOX = 2.7 g/kW-hr (2.0 g/bhp-hr) and CO = 4.4 g/kW-hr (3.3 g/bhp-hr). This is compared to the 2.0 g NOx/bhp-hr and 4.0 g CO/bhp-hr emission standards that were shown in the permit application.

Note the attached certificate of conformity for the engine is consistent with the 40 CFR Part 1048 emission standards.

Walter Konkel

EcoLogic Environmental Consultants, LLC

(805) 964-7597 (office)

(805) 284-4430 (mobile)

[wkonkel@elogicllc.com](mailto:wkonkel@elogicllc.com)

---

**From:** Zawaski, Danell [<mailto:Danell.Zawaski@williams.com>]

**Sent:** Thursday, November 12, 2015 6:37 AM

**To:** Walter Konkel

**Subject:** FW: Oak Grove - Subpart OOOO

*R. Danell Zawaski, PE*

Environmental Specialist  
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[Danell.zawaski@williams.com](mailto:Danell.zawaski@williams.com)

**From:** Kessler, Joseph R [<mailto:Joseph.R.Kessler@wv.gov>]  
**Sent:** Thursday, November 12, 2015 9:36 AM  
**To:** Zawaski, Danell <[Danell.Zawaski@williams.com](mailto:Danell.Zawaski@williams.com)>  
**Subject:** RE: Oak Grove - Subpart OOOO

I agree JJJJ is absurdly confusing and that 4233(c) does not specifically cite "emergency engines." But I don't agree with Walter's reasoning here, and the EPA RICE tool also points the engine toward Part 1048.

<http://www3.epa.gov/ttn/atw/ice/quiz.html>

Joe Kessler

---

**From:** Zawaski, Danell [<mailto:Danell.Zawaski@williams.com>]  
**Sent:** Tuesday, November 10, 2015 12:38 PM  
**To:** Kessler, Joseph R  
**Subject:** FW: Oak Grove - Subpart OOOO

I will call you after lunch to discuss.

*R. Danell Zawaski, PE*

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[Danell.zawaski@williams.com](mailto:Danell.zawaski@williams.com)

**From:** Walter Konkel [<mailto:wkonkel@elogicllc.com>]  
**Sent:** Tuesday, November 10, 2015 12:04 PM  
**To:** Zawaski, Danell <[Danell.Zawaski@williams.com](mailto:Danell.Zawaski@williams.com)>  
**Subject:** RE: Oak Grove - Subpart OOOO

Danell – The basis for the applicable NSPS JJJJ emission standards for the Oak Grove Emergency Generator engine is as follows:

The emergency generator is a 224 bhp four stroke rich burn engine fired on propane. The applicable emission standards are taken from Table 1 of NSPS JJJJ, — *NOX, CO, and VOC Emission Standards for Stationary Non-Emergency SI Engines ≥100 HP (Except Gasoline and Rich Burn LPG), Stationary SI Landfill/Digester Gas Engines, and Stationary Emergency Engines >25 HP*. The applicable standards are 2.0 g NO<sub>x</sub>/bhp-hr, 4.0 g CO/bhp-hr and 1.0 g VOC/bhp-hr.

I would like to call attention to Table 1 of NSPS JJJJ. The title of the table is read as NO<sub>x</sub>, CO, and VOC Emission Standards for Stationary Non-Emergency SI Engines ≥100 HP (Except Gasoline and Rich Burn LPG Stationary Non-Emergency SI Engines [emphasis added]), Stationary SI Landfill/Digester Gas Engines, and Stationary Emergency Engines >25 HP. The placement of the commas in the table heading leads one to believe that ALL stationary emergency engines, regardless of the fuel fired, are subject to emission standards found in Table 1 to NSPS JJJJ.

Engines with emission standards referenced in §60.4233:

- (a) Owners and operators of stationary SI ICE with a maximum engine power less than or equal to 19 KW (25 HP) manufactured on or after July 1, 2008
- (b) Owners and operators of stationary SI ICE with a maximum engine power greater than 19 KW (25 HP) manufactured on or after the applicable date in §60.4230(a)(4) that use gasoline
- (c) Owners and operators of stationary SI ICE with a maximum engine power greater than 19 KW (25 HP) manufactured on or after the applicable date in §60.4230(a)(4) that are rich burn engines that use LPG
- (d) Owners and operators of stationary SI ICE with a maximum engine power greater than 19 KW (25 HP) and less than 75 KW (100 HP) (except gasoline and rich burn engines that use LPG)

None of the above referenced engines are found in Table 1 to NSPS JJJJ below. Engines identified in (b),(c) and (d) above are concluded to be gasoline and rich burn LPG engines that are stationary non-emergency SI engines.

**Table 1 to Subpart JJJJ of Part 60—NO<sub>x</sub>, CO, and VOC Emission Standards for Stationary Non-Emergency SI Engines ≥100 HP (Except Gasoline and Rich Burn LPG), Stationary SI Landfill/Digester Gas Engines, and Stationary Emergency Engines >25 HP**

Engine type and fuel	Maximum engine power	Manufacture date	Emission standards (g/HP-hr)	
			NO <sub>x</sub>	CO
Non-Emergency SI Natural Gas <sup>b</sup> and Non-Emergency SI Lean Burn LPG <sup>b</sup>	100≤HP<500	7/1/2008	2.0	4.0
		1/1/2011	1.0	2.0
Non-Emergency SI Lean Burn Natural Gas and LPG	500≤HP<1,350	1/1/2008	2.0	4.0
		7/1/2010	1.0	2.0
Non-Emergency SI Natural Gas and Non-Emergency SI Lean Burn LPG (except lean burn 500≤HP<1,350)	HP≥500	7/1/2007	2.0	4.0
		7/1/2010	1.0	2.0
Landfill/Digester Gas (except lean burn 500≤HP<1,350)	HP<500	7/1/2008	3.0	5.0
		1/1/2011	2.0	5.0
		7/1/2007	3.0	5.0
Landfill/Digester Gas Lean Burn	500≤HP<1,350	7/1/2008	3.0	5.0
		7/1/2010	2.0	5.0
Emergency	25<HP<130	1/1/2009	3.0	387
		HP≥130	2.0	4.0

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---

**From:** Zawaski, Danell [<mailto:Danell.Zawaski@williams.com>]  
**Sent:** Wednesday, November 04, 2015 12:31 PM  
**To:** Walter Konkel  
**Subject:** FW: Oak Grove - Subpart OOOO

*R. Danell Zawaski, PE*

Environmental Specialist  
NEGP Environmental Services  
304-843-3133 Moundsville  
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505/787-7926 cell  
412/787-6002 fax  
[Danell.zawaski@williams.com](mailto:Danell.zawaski@williams.com)

**From:** Kessler, Joseph R [<mailto:Joseph.R.Kessler@wv.gov>]  
**Sent:** Wednesday, November 04, 2015 3:27 PM  
**To:** Zawaski, Danell <[Danell.Zawaski@williams.com](mailto:Danell.Zawaski@williams.com)>  
**Subject:** RE: Oak Grove - Subpart OOOO

As a 4SRB LPG engine, I read JJJJ as, pursuant to §60.4233(c), and then through §60.4231(c), as pointing to the emission standards under 40 CFR part 1048 and not Table 1. As the emissions of the new engine were based on the JJJJ Table 1 limits, this may need to be altered. Trying to figure out what the standards are under 1048 is confusing for an individual engine. Please let me know what you think.

Joe

---

**From:** Zawaski, Danell [<mailto:Danell.Zawaski@williams.com>]  
**Sent:** Wednesday, November 04, 2015 1:47 PM  
**To:** Kessler, Joseph R  
**Subject:** RE: Oak Grove - Subpart OOOO

That appears correct to us.

*R. Danell Zawaski, PE*

Environmental Specialist  
NEGP Environmental Services  
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412/787-4259 Pittsburgh  
505/787-7926 cell  
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[Danell.zawaski@williams.com](mailto:Danell.zawaski@williams.com)

**From:** Kessler, Joseph R [<mailto:Joseph.R.Kessler@wv.gov>]  
**Sent:** Wednesday, November 04, 2015 10:11 AM  
**To:** Zawaski, Danell <[Danell.Zawaski@williams.com](mailto:Danell.Zawaski@williams.com)>  
**Subject:** Oak Grove - Subpart OOOO

Danell, it looks like Jerry applied Subpart OOOO reciprocating compressor requirements to the standby generator under 3070. That unit is to provide backup power, correct? So, as it is not compressing any gas, I don't believe OOOO applies to that unit. However, it does apply to the electric compressors at the co-located "Independence Compressor Station," which I can integrate into this permit.

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](mailto:Joseph.r.kessler@wv.gov)



**Kessler, Joseph R**

---

**From:** Zawaski, Danell <Danell.Zawaski@williams.com>  
**Sent:** Wednesday, July 01, 2015 4:41 PM  
**To:** McKeone, Beverly D; Kessler, Joseph R  
**Subject:** Oak Grove and Moundsville DRE letters  
**Attachments:** 21986 Williams Oakgrove DRE Letter - 30-Jun-2015.pdf; 22296 Williams Moundsville DRE Letter - 30-Jun-2015.pdf

Attached are the Vendor DRE letters that were requested. Please let me know if you have any questions.

Regards,  
Danell

*R. Danell Zawaski, PE*

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*Entire Document*  
**NON-CONFIDENTIAL**

I.D. No. OSI-60157 Reg. 301cA  
Company OVM  
Facility OAK GROVE Region \_\_\_\_\_  
Initials [Signature]



- *Burners*
- *Flares*
- *Incinerators*
- *Combustion Systems*

22151 East 91<sup>st</sup> Street  
Broken Arrow, OK 74014 USA  
Phone: 918-258-8551  
Fax: 918-251-5519

---

[www.zeeco.com](http://www.zeeco.com)  
[doug\\_allen@zeeco.com](mailto:doug_allen@zeeco.com)

June 30, 2015

Williams Ohio Valley Midstream LLC  
Park Place Corporate Center 2  
2000 Commerce Drive  
Pittsburg, PA 15275  
USA

Subject: Destruction Efficiency of Air Assisted Flares

Reference: Air Assisted Flare – Oak Grove  
Zeeco S.O. Numbers 21986

Attn: Ms. R. Danell Zawaski P.E.

Zeeco would like to confirm that we guarantee a Destruction Removal Efficiency (DRE) of 99% from the Air Assisted Flare on this project when operated within the guidelines given in the Zeeco Operating Manual. If there are any questions or if more information is needed please let us know.

Thank you and Best Regards,

*Doug Allen*

Doug Allen  
Chief Engineer, Zeeco Inc.



Williams Ohio Valley Midstream LLC  
Park Place Corporate Center 2  
2000 Commerce Drive  
Pittsburgh, PA 15275  
(412) 787-7300  
(412) 787-6002 fax

April 30, 2015  
(Via Federal Express)

Edward S. Andrews, P.E.  
Engineer  
Division of Air Quality  
West Virginia Department of Environmental Protection  
601 57th Street SE  
Charleston, WV 25304-2345

**Subject: Application for 45CSR13 NSR Modification Permit  
Williams Ohio Valley Midstream LLC  
Oak Grove Gas Plant  
Permit Application No. R13-3070A**

**NON-CONFIDENTIAL**

Dear Mr. Andrews:

Williams Ohio Valley Midstream LLC (Williams) is in receipt of your letter dated April 13, 2015 regarding our air permit application to modify the Oak Grove Gas Plant which was submitted to the West Virginia Department of Environmental Protection (WVDEP) Department of Air Quality on January 13, 2015. This letter summarizes each of your comments and a response to each comment is provided as follows:

**WVDEP Comment 1a:** "Your application claims that the process flare has a minimum guarantee combustion efficiency of 99%. The flare data sheets provided on March 25, 2015 notes that the Zeeco AFTA -24/80 "flare system is designed for 99% destruction efficiency or better." In the provide sheets, the design case notes the molecular weight of 20.0, L. H. V. of 1,1108 Btu/sfc, and a flow rate of 439,174 lbs/hr. For governing smokeless case, the smokeless rate is 87,350 lb/hr. Your application request to increase the maximum short term flow rate of waste gas to the flare up to 208,000 lb/hr, which is beyond the design conditions to operate the flare in a smokeless operation. The agency needs some sort of insurances that the flare will be able to achieve the emission standards under 45 CSR 6 and that the flare is achieving a destruction efficiency of 99% during smoking conditions."

**Response:** The manufacturer's guaranteed destruction efficiency of 99 percent is for the flare design basis of 439,174 lb/hr and its applicability is not limited to smokeless operation. The short-term waste gas flow rate of 208,000 lb/hr would occur only during an upset condition, which is not required to meet the smokeless requirements of 40 CFR 60.18. In fact, a flare study conducted by the TCEQ in 2010 concluded that the most efficient flare operation, as measured by the destruction and removal efficiency

Edward S. Andrews, P.E.  
WVDEP – Division of Air Quality  
April 30, 2015  
Page 02 of 07

(DRE), and combustion efficiency (CE), for the flare operating conditions tested, was achieved at or near the incipient smoke point (ISP). Higher efficiencies could have been achieved with steam or air assist slightly less than the ISP assist value but this condition, i.e., a smoking flare, would not have been in compliance with 40 CFR § 60.18 and a requirement of the study was that all data be obtained at flare operating points in compliance with 40 CFR § 60.18. See <http://www.tceq.texas.gov/assets/public/implementation/air/rules/Flare/TCEQ2010FlareStudyDraftFinalReport.pdf>), see Page 29.

Based on the flare manufacturer's guarantee and conclusions reached in the 2010 TCEQ flare study, Williams has no reason to believe the flare's destruction efficiency at a maximum flow rate of 439,174 lb/hr will be less than the guaranteed value of 99 percent.

**WVDEP Comment 1b:** "Please provide calculations, drawing, and any other data used to determine the tip velocity in the application and as determined in the flare data sheets by the flare manufacturer. Please explain the difference between these two velocities."

**Response:** The approximate exit velocity of 1,196 feet per second as shown on the flare manufacturer's data sheet is based on one of many different cases evaluated and is representative of an upset condition. Based on the anticipated routine waste gas streams sent to the flare, the actual flare tip velocity is estimated at 37.64 feet per second. The exit velocity of 0.60 feet per second as shown on the Attachment M, *Air Pollution Control Device Sheet* is incorrect.

A drawing of the flare has already been provided to the WVDEP and the flare manufacturer did not provide an explanation on how the approximate flare velocity was estimated.

**WVDEP Comment 1c:** "Please propose a standardize means of monitoring the operation of the flare that can be related back to manufacturer's destruction efficiency of 99%. If one cannot be proposed, please re-estimate your VOC and HAP emissions from the flare based on a destruction efficiency of 98%."

**Response:** As stated in our March 25, 2015 e-mail, the manufacturer of the Oak Grove flare has guaranteed a 99% VOC/HAP destruction efficiency. The flare manufacturer, Zeeco, is experienced and very knowledgeable about flares and provided this guarantee in good faith. Williams' original permitting of this flare was based on this manufacturer guaranteed 99% destruction efficiency, which was provided to WVDEP at that time and which was not questioned. In fact, WVDEP previously issued permit R13-3070 for the Oak Grove flare based on the manufacturer guarantee of 99% destruction efficiency. No changes made in the new permit application would have any impact on the destruction efficiency of the flare itself.

Edward S. Andrews, P.E.  
WVDEP – Division of Air Quality  
April 30, 2015  
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Additionally, the heat content of the waste gas sent to the flare is over three times higher than the minimum required pursuant to 40 CFR Part 60.18. A higher waste gas heat content correlates to a higher combustion efficiency. Furthermore, Williams' Oak Grove flare is equipped with a variable speed fan that automatically adjusts air flow as the amount of waste gas to the flare changes. The waste gas stream is undiluted by design.

Based on the flare manufacturer's guarantee, the high waste gas heat content, and the presence of the variable speed blower, Williams has no reason to believe the flare's destruction efficiency will be less than the guaranteed value of 99 percent.

**WVDEP Comment 1d:** "Please explain why the average purge gas in the application is 4,000 scf per hour and the flare design only requires 870 scf per hour of purge gas."

**Response:** The purge gas rate of 870 scf/hour found in the manufacturer's literature is a minimum flow rate. The purge gas flow rate of 4,000 scf/hour used in the permit application is a maximum rate based on a total of eight purge points, each at 500 scf/hour. There are two purge points each for TXP1, TXP2, and TXP3 and one purge point each for the deethanizer and BOP. A purge gas rate higher than the minimum specification is used to ensure that the flow never drops below 870 scf/hour. This would prevent the total purge gas flow rate from dropping below the specified minimum if, for example, several purge points shut off due to an emergency.

**WVDEP Comment 1e:** "Please explain why the flow rate of pilot gas for the pilot lights listed in the application exceeds the manufacturer's specified rate."

**Response:** The manufacturer specifies a flow rate of 65 scfh per pilot. There are three pilots for a total pilot gas flow rate of 195 scfh. The manufacturer also specifies an intermittent ignition gas flow rate of 110 scfh. As the ignition gas is intermittent, and the specific amount of gas used cannot be determined, the total continuous flow rate of pilot gas plus ignition gas was estimated at 225 scfh.

**WVDEP Comment 1f:** "Is Williams using this flare to achieve compliance of emission standard or part of LDAR requirement under Part 60? If so, please identify the sources and/or components that are or will be vent to the flare."

**Response:** The flare is used to achieve compliance with the LDAR provisions under 40 CFR Part 60, specifically to control PSVs, which are included in the LDAR program. The maximum number of components Williams estimates to be installed, as well as the EPA accepted emission rates, were provided in our permit application submitted on January 13, 2015.

In regards to the individual components that will vent to the flare, the Oak Grove plant is not yet entirely constructed, so the current component list will increase over time with the understanding that the maximum number of components will stay below the

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permitted values. The component list is large and is growing with the permitted expansion of the facility. The components are tracked and compliance is demonstrated following OOOO (LDAR) regulations for monitoring, recordkeeping and reporting. At this time it is not possible for Williams to provide a complete list of components that will be vented to the flare. However, provided that the maximum number of components remains below permitted values, Williams' inability to provide a complete list at this time does not affect the processing of our permit application.

**WVDEP Comment 1g:** "Is nitrogen used during maintenance related activities that would be purged into the flare header? If so, please determine the amount of nitrogen used on a maximum hourly and annual basis. This nitrogen would form thermal oxides of nitrogen that needs to be account with the potential emissions from the flare."

**Response:** Small amounts of nitrogen may be used as purge gas from time to time as dictated by safety needs. The minimal and intermittent use of nitrogen during maintenance related activities would not be expected to create significant amounts of thermal nitrogen oxides. Thermal NO<sub>x</sub> formation is greatly dependent upon high temperatures (~2900° F) and residence time, neither of which condition is typical for combustion characteristic of flares. The concentration of nitrogen realized by the addition in small amounts described above would have no appreciable influence on the amounts of thermal nitrogen oxides forecasted to be formed. Furthermore, it can be concluded from the 2010 TCEQ flare study that excessive amounts of non-fuel bound nitrogen used in a flare does not create additional oxides of nitrogen.

**WVDEP Comment 1h:** "Please provide the gas analysis of the flare header that indicates compliance with 45 CSR §10-5.1. (50 grain H<sub>2</sub>S Standard). You may proposed an alternative means for demonstration compliance to be incorporated in the permit."

**Response:** 45 CSR §10-5.1 (50 grain H<sub>2</sub>S Standard) applies to fuel burning units. The WVDEP's General Engineering Evaluation / Fact Sheet for general permits G-70A and G-80A state:

*45CSR10 establishes emission limitations for SO<sub>2</sub> emissions which are discharged from stacks of fuel burning units. A "fuel burning unit" means and includes any furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer. Sources that meet the definition of "Fuel Burning Units" per 45CSR10-2.8 include gas producing units, in-line heaters, heater treaters, and glycol dehydration unit reboilers.*

The Oak Grove process flare is not a "fuel burning unit" as it does not produce heat or power by indirect heat transfer and thus is not subject to the requirements of 45CSR10. A thorough review of WVDEP Engineering Evaluations/Fact Sheets for facilities with flares further indicates that 45 CSR 10 is not applicable to process flares.

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It should also be noted that there is no process gas stream that contains hydrogen sulfide in a concentration greater than 50 grains per 100 cubic feet of gas burned in the flare as demonstrated by the gas analysis provided with our permit application. The Oak Grove plant processes “sweet” natural gas containing less than 0.25 grain hydrogen sulfide per 100 standard cubic feet.

**WVDEP Comment 2:** “Please explain the reason for the increase in the design heat input of the TXP1 Hot Oil Heater, TXP1 Regen Gas Heater, TXP2 Regen Gas Heater, and TXP3 Regen Gas Heater. Are these new heaters? Would these heaters increase the processing rate of the natural gas through the extraction units?”

Please clarify the fuel source for these heaters.

Does each heater has it own dedicated flow meter?

Please explain why there were these hourly operating limits in Permit Application R13-3070.”

**Response:** The permit application reflects an increase in design heat input for the heaters as the original application shows the heater duty rather than the maximum design heat input. These are not new heaters, we are simply assigning the correct maximum design heat input (MDHI) values for each unit. As there are no physical changes being made to the heaters, there will be no increase in the processing rate of natural gas through the extraction units.

The fuel source for each heater is inlet gas, residue natural gas or ethane. Residue gas was used in determining potential to emit as it results in the highest emissions.

Note that federal rules do not require the use of individual fuel meters; however, each heater installed at the facility has its own dedicated fuel meter with the exception of the TXP1 heat medium heater. Not all of the permitted heaters are installed at this time.

Permit Application R13-3070 incorporated hourly operating limits on some of the heaters to avoid becoming a major PSD source of greenhouse gas emissions. On June 23, 2014, the U.S. Supreme Court issued its decision in *Utility Air Regulatory Group v. EPA* (No. 12-1146) stating that the EPA may not treat greenhouse gases as an air pollutant for purposes of determining whether a source is a major source required to obtain a PSD or title V permit. As a result of this ruling, there is no longer any reason to accept limitations on the heater operating hours. As such, Permit Application R13-3070A reflects each heater operating up to 8,760 hours per year.

**WVDEP Comment 3a:** “Please provide drawings of the facility's piping schematics.”

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**Response:** For various reasons, it is not practical to provide drawings of the facility's piping schematics. We have instead provided a process flow diagram for the facility which is located in Appendix F of our permit application. Please note that we have not been required to provide piping schematics in any prior permit application submitted to WVDEP. Also, many of the piping schematics are still in the process of being developed. Lastly, the current piping schematics in our drawing database include over 2,000 files.

**WVDEP Comment 3b:** "Has or is MarkWest going to demonstrate that certain process equipment(s) and/or component(s) is not in VOC service? If so, please he and note which process streams are not in VOC service as defined in 40 CFR §60.5400(.t) and methods used to determine the percent VOC content of the process fluid that is contained in or contacts a piece of equipment.

Please note if the facility is using the alternative work practice (optical gas imaging instrument) for LDAR in accordance with 40 FR §60.18(g). (See Federal Register/Vol. 73, No. 246.)"

**Response:** The Oak Grove Plant has no relation to MarkWest as this facility is owned and operated by Williams. Williams has submitted a permit application to WVDEP that provides information relating to components in VOC service (40 CFR §60.5400(±)). Demonstration of "LDAR" applicability is determined by equipment that is in greater than 10% VOC by weight. Gas analyses and mass balance calculations based on process knowledge are used to determine the VOC service of equipment that is inherent in the design of each process facility.

The facility will not be using the alternative work practice (optical gas imaging instrument) for LDAR in accordance with 40 CFR §60.18(g).

**WVDEP Comment 4:** "Please provide a complete report of the Pro Max process simulation that indicates that increase of slop oil/condensate in the TK-1 through TK-4 does not generator any flash emissions. In addition, please identify the equation of state (EOS) used in this simulation."

**Response:** The complete ProMax process simulation report is attached demonstrating the absence of flash emissions from storage tanks TK-01 through TK-04. In addition, the Peng-Robinson equation of state was used in the process simulation.

**WVDEP Comment 5:** "Please provide a legible copy of the TANKs detailed report for the working and breathing losses from TK-1 though TK-4."

**Response:** A copy of the EPA TANKS 4.0 output showing working and breathing losses from storage tanks TK-01 through TK-04 is attached.

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**WVDEP Comment 6:** “Please provide a complete report of the simulation that predicts the emissions from the deethanizer unit. In addition, please identify the EOS used in this simulation, inputs used, specific design parameters, and amine used in the process. The report needs to identify any other pollutants being released from the flash gas or acid gas streams.”

**Response:** There was no process simulation performed for the de-ethanizer unit as emissions from this equipment are only from process piping fugitive leaks. If the WVDEP is asking about emissions related to the amine unit, a copy of the Dow Chemical Company ProComp simulation, as provided by the equipment manufacturer, is included with the permit application.

**WVDEP Comment 7:** “Please explain how the “worst-case assumption” was formulated for the inlet compressor leaks.”

**Response:** The inlet compressor dry gas seal emissions are based on a vendor supplied leak rate and anticipated worst-case gas composition. For example, the actual VOC content of the inlet gas stream (as determined through sampling and analysis) is 11,271 lb/MMscf and this was increased by approximately 20 percent and a value of 13,600 lb/MMscf was used to estimate emissions. The 20 percent contingency is to account for potential future changes in gas quality.

If you have any questions concerning this submittal or need additional information, please contact me at (412) 787-4259 or [Danell.Zawaski@williams.com](mailto:Danell.Zawaski@williams.com).

Sincerely,



R. Danell Zawaski, P.E.  
Environmental Specialist

Attachments

**TANKS 4.0.9d**  
**Emissions Report - Summary Format**  
**Tank Identification and Physical Characteristics**

**Identification**

User Identification: Oak Grove TK-01 thru TK-04  
 City: Moundsville  
 State: West Virginia  
 Company: Williams Ohio Valley Midstream  
 Type of Tank: Vertical Fixed Roof Tank  
 Description: 400 bbl slop liquids storage tank

**Tank Dimensions**

Shell Height (ft): 20.00  
 Diameter (ft): 12.00  
 Liquid Height (ft) : 20.00  
 Avg. Liquid Height (ft): 10.00  
 Volume (gallons): 16,800.00  
 Turnovers: 59.52  
 Net Throughput(gal/yr): 1,000,000.00  
 Is Tank Heated (y/n): N

**Paint Characteristics**

Shell Color/Shade: Gray/Light  
 Shell Condition: Good  
 Roof Color/Shade: Gray/Light  
 Roof Condition: Good

**Roof Characteristics**

Type: Cone  
 Height (ft) 0.00  
 Slope (ft/ft) (Cone Roof) 0.06

**Breather Vent Settings**

Vacuum Settings (psig): -0.03  
 Pressure Settings (psig) 0.03

Meteorological Data used in Emissions Calculations: Pittsburgh, Pennsylvania (Avg Atmospheric Pressure = 14.11 psia)

**TANKS 4.0.9d**  
**Emissions Report - Summary Format**  
**Liquid Contents of Storage Tank**

**Oak Grove TK-01 thru TK-04 - Vertical Fixed Roof Tank**  
**Moundsville, West Virginia**

Mixture/Component	Month		Daily Liquid Surf. Temperature (deg F)		Liquid Bulk Temp (deg F)	Vapor Pressure (psia)		Vapor Mol. Weight	Liquid Miss Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
	Avg.	Min.	Avg.	Max.		Avg.	Max.					
Slip Hydrocarbon Liquids	All	56.69	48.70	64.69	52.55	8.3448	7.2810	9.5477	51.3324	0.0031	96.32	
2,2-Dimethylbutane		3.9522	3.2597	4.7496	86.1770	3.9522	3.2597	4.7496	86.1770	0.0027	86.18	Option 1: VP50 = 3.355 VP60 = 4.247
2-Methylpentane		2.5136	2.0480	3.0623	86.1800	2.5136	2.0480	3.0623	86.1800	0.0195	86.18	Option 2: A=6.8391, B=1135.41, C=226.57
3-Methylpentane		2.2529	1.8282	2.7524	86.1770	2.2529	1.8282	2.7524	86.1770	0.0119	86.18	Option 1: VP50 = 1.884 VP60 = 2.435
Benzene		1.0648	0.8464	1.3282	78.1100	1.0648	0.8464	1.3282	78.1100	0.0003	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cyclohexane		1.1069	0.8846	1.3736	84.1600	1.1069	0.8846	1.3736	84.1600	0.0031	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Cyclopentane		3.8828	3.1865	4.6754	70.1300	3.8828	3.1865	4.6754	70.1300	0.0038	70.13	Option 1: VP50 = 3.287 VP60 = 4.177
Decane (-n)		0.0310	0.0257	0.0572	142.2900	0.0310	0.0257	0.0572	142.2900	0.0002	142.29	Option 1: VP50 = 0.26411 VP60 = 0.33211
Ethane		477.7593	431.8129	527.0337	30.0700	477.7593	431.8129	527.0337	30.0700	0.0005	30.07	Option 1: VP50 = 436.71 VP60 = 497.04
Heptane (-n)		0.5535	0.4327	0.7028	100.2000	0.5535	0.4327	0.7028	100.2000	0.0311	100.20	Option 3: A=37358, B=8.2585
Hexane (-n)		1.7546	1.4148	2.1588	86.1700	1.7546	1.4148	2.1588	86.1700	0.0310	86.17	Option 2: A=6.876, B=1171.17, C=224.41
iso-Butane		36.1072	31.2831	41.4341	58.1300	36.1072	31.2831	41.4341	58.1300	0.0088	58.13	Option 1: VP50 = 31.982 VP60 = 36.144
iso-Pentane		8.8178	7.3924	10.4372	72.1500	8.8178	7.3924	10.4372	72.1500	0.0250	72.15	Option 1: VP50 = 7.592 VP60 = 9.423
Methylcyclopentane		1.5633	1.2851	1.9601	84.1600	1.5633	1.2851	1.9601	84.1600	0.0105	84.16	Option 2: A=6.8628, B=1166.059, C=226.04
n-Butane		24.5056	21.0778	28.5399	58.1300	24.5056	21.0778	28.5399	58.1300	0.0335	58.13	Option 1: VP50 = 21.563 VP60 = 26.098
Nonane (-n)		0.0607	0.0499	0.0736	128.2600	0.0607	0.0499	0.0736	128.2600	0.1086	128.26	Option 1: VP50 = 0.051285 VP60 = 0.056278
Octane (-n)		0.1345	0.1091	0.1655	114.2300	0.1345	0.1091	0.1655	114.2300	0.3096	114.23	Option 1: VP50 = 0.112388 VP60 = 0.146444
Pentane (-n)		6.3491	5.2897	7.5784	72.1500	6.3491	5.2897	7.5784	72.1500	0.0407	72.15	Option 3: A=27691, B=7.568
Propane		103.0798	90.9417	116.2827	44.1100	103.0798	90.9417	116.2827	44.1100	0.4654	44.11	Option 1: VP50 = 92.73 VP60 = 106.19



**TANKS 4.0.9d**  
**Emissions Report - Summary Format**  
**Individual Tank Emission Totals**

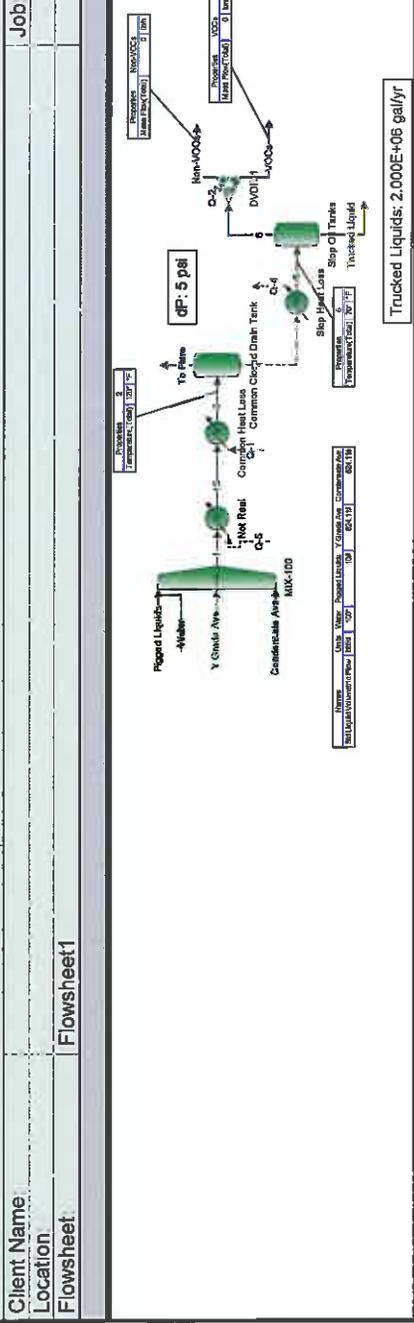
**Emissions Report for: Annual**

**Oak Grove TK-01 thru TK-04 - Vertical Fixed Roof Tank**  
**Moundsville, West Virginia**

Components	Losses (lbs)			Total Emissions
	Working Loss	Breathing Loss		
Slop Hydrocarbon Liquids	6,840.14	2,644.02		9,484.17
Propane	3,183.55	1,230.58		4,414.13
Nonane (-n)	10.23	3.95		14.18
Decane (-n)	1.60	0.62		2.22
iso-Butane	489.26	189.12		678.39
n-Butane	1,268.18	490.21		1,758.39
iso-Pentane	338.92	131.01		469.93
Pentane (-n)	396.96	153.44		550.40
Cyclopentane	26.22	10.13		36.35
2,2-Dimethylbutane	18.78	7.26		26.04
2-Methylpentane	133.54	51.62		185.15
3-Methylpentane	81.57	31.53		113.10
Hexane (-n)	212.25	82.04		294.29
Methylcyclopentane	25.83	9.98		35.81
Benzene	2.26	0.87		3.13
Cyclohexane	21.45	8.29		29.74
Heptane (-n)	212.77	82.24		295.01
Octane (-n)	64.06	24.76		88.83
Ethane	352.72	136.34		489.06



# Flowsheet1 Plant Schematic



\* User Specified Values  
 ? Extrapolated or Approximate Values

## Process Streams Report All Streams Tabulated by Total Phase

Client Name		Job
Location		
Flowsheet	Flowsheet I	

### Connections

	Condensate Ave	Non-VOCs	Pigged Liquids	To Flare	Trucked Liquid
From Block	-	DVDR-1	-	Common Closed Drain Tank	Slop Oil Tanks
To Block	MIX-100	-	MIX-100	-	-

### Stream Composition

Mole Fraction	Condensate Ave %	Non-VOCs %	Pigged Liquids %	To Flare %	Trucked Liquid %
Nitrogen	0 *		0.0841757 *	0.000684867	9.79816E-08
Carbon Dioxide	0.0341359 *		0.0929999 *	0.231374	0.000358164
Methane	2.8289 *		25.7684 *	2.97308	0.00133944
Ethane	8.83755 *		21.4281 *	37.6064	0.0860512
Propane	20.419 *		18.4988 *	20.4594	0.144428
Isobutane	4.75229 *		3.27408 *	3.00589	0.0496944
Butane	17.2241 *		10.6153 *	9.58012	0.219352
Isopentane	5.7271 *		3.30363 *	2.70187	0.142856
Pentane	8.06588 *		4.87495 *	3.69634	0.252581
2,2-Dimethylbutane	0.3991 *		0.125341 *	0.165739	0.0175415
2,3-Dimethylbutane	0 *		0.258297 *	0.0115085	0.00160146
Cyclopentane	0.724894 *		0 *	0.288424	0.0283374
2-Methylpentane	3.18363 *		1.42563 *	1.30332	0.195839
3-Methylpentane	2.00939 *		0.902136 *	0.815137	0.136048
Hexane	5.9633 *		2.46572 *	2.3707	0.476065
2,2-Dimethylpentane	0.0549312 *		0.0353938 *	0.0215696	0.00582275
Methylcyclopentane	0.798855 *		0.259813 *	0.313698	0.0681985
2,4-Dimethylpentane	0.19255 *		0 *	0.0721942	0.0206042
Benzene	0.111072 *		0.027347 *	0.0432854	0.00994843
3,3-Dimethylpentane	0.0395115 *		0 *	0.0145449	0.00502529
Cyclohexane	0.815257 *		0.234018 *	0.312685	0.0864935
2-Methylhexane	1.36372 *		0.59819 *	0.502063	0.206654
2,3-Dimethylpentane	0.295568 *		0.147625 *	0.10972	0.0435839
3-Methylhexane	1.60428 *		0.888268 *	0.588796	0.257429
3-Ethylpentane	0.164388 *		0.06498 *	0.0595642	0.0271985
2,2,4-Trimethylpentane	0.162655 *		0.077095 *	0.05829	0.0294111
Heptane	3.32949 *		1.3509 *	1.1755	0.637955
Methylcyclohexane	2.05828 *		0.6924 *	0.718859	0.40974
2,5-Dimethylhexane	0.156467 *		0.0595356 *	0.0513567	0.0407377
2,4-Dimethylhexane	0.189348 *		0 *	0.0614704	0.0484456
Ethylcyclopentane	0 *		0.11121 *	0.00132347	0.000856289
Toluene	0.307693 *		0.120347 *	0.103882	0.0723034
2-Methylheptane	1.13077 *		0.406444 *	0.341489	0.378783
4-Methylheptane	0.45696 *		0.157845 *	0.136947	0.156011
3-Methylheptane	0.829213 *		0.291228 *	0.245629	0.291679
cis-1,3-Dimethylcyclohexane	0.343973 *		0.160113 *	0.103753	0.116764
Octane	1.40589 *		0.562479 *	0.388396	0.578677
trans-1,2-Dimethylcyclohexane	0.118779 *		0.0432495 *	0.0346829	0.0432636
trans-1,3-Dimethylcyclohexane	0.139757 *		0.0149661 *	0.0397594	0.0528369
cis-1,2-Dimethylcyclohexane	0.184244 *		0 *	0.0493649	0.0780634
Ethylcyclohexane	0.235414 *		0.0890173 *	0.0691154	0.0848176
Ethylbenzene	0.0738732 *		0.014698 *	0.0186651	0.0350807
m-Xylene	1.15768 *		0.1136 *	0.273872	0.601255
o-Xylene	0.0530858 *		0.0169592 *	0.0120173	0.0295039
Nonane	0.671218 *		0.162486 *	0.118934	0.468853
Cumene	0.0954282 *		0.0135252 *	0.0163712	0.0680053
Cyclooctane	0.0639352 *		0.0232066 *	0.0127363	0.040708
Propylcyclohexane	0.11069 *		0.031349 *	0.0180334	0.0821183
Propylbenzene	0.0384758 *		0 *	0.00581723	0.0295955
Mesitylene	0.15847 *		0.0313555 *	0.0204966	0.132943
tert-Butylbenzene	0 *		0.0181071 *	4.16298E-05	0.000328432

\* User Specified Values  
? Extrapolated or Approximate Values

Process Streams Report All Streams Tabulated by Total Phase					
Client Name					Job
Location					
Flowsheet	Flowsheet1				
Stream Composition					
Mole Fraction	Condensate Ave %	Non-VOCs %	Pigged Liquids %	To Flare %	Trucked Liquid %
1,2,4-Trimethylbenzene	0.0850393 *		0 *	0.0100817	0.0736263
Cyclohexane, Isobutyl-	0.222386 *		0 *	0.0269491	0.190811
Decane	0.105939 *		0.0548657 *	0.00970161	0.10154
Isobutylbenzene	0.0790342 *		0 *	0.0085975	0.0707128
sec-Butylbenzene	0.0730368 *		0 *	0.00683282	0.0686387
1,2,3-Trimethylbenzene	0.179301 *		0 *	0.0189424	0.162087
Cyclohexane, Butyl-	0.0464215 *		0 *	0.00365031	0.0456758
Butylbenzene	0.127646 *		0 *	0.00889674	0.128971
Water	0 *		0.00979363 *	8.58145	92.1661
Molar Flow	Condensate Ave lbmol/h	Non-VOCs lbmol/h	Pigged Liquids lbmol/h	To Flare lbmol/h	Trucked Liquid lbmol/h
Nitrogen	0 *	0	0.00139634 *	0.0013963	6.74978E-08
Carbon Dioxide	0.0286105 *	0	0.00154272 *	0.471725	0.000246733
Methane	2.371 *	0	0.427457 *	6.06151	0.000922716
Ethane	7.40706 *	0	0.355458 *	76.6718	0.0592792
Propane	17.1139 *	0	0.306865 *	41.7125	0.0994938
Isobutane	3.98306 *	0	0.0543118 *	6.12841	0.0342336
Butane	14.4361 *	0	0.176091 *	19.5319	0.151108
Isopentane	4.80009 *	0	0.0548019 *	5.50855	0.0984108
Pentane	6.7603 *	0	0.0808677 *	7.53608	0.173999
2,2-Dimethylbutane	0.3345 *	0	0.0020792 *	0.337907	0.0120841
2,3-Dimethylbutane	0 *	0	0.00428474 *	0.0234634	0.00110322
Cyclopentane	0.60756 *	0	0 *	0.588038	0.0195212
2-Methylpentane	2.66831 *	0	0.0236489 *	2.6572	0.13491
3-Methylpentane	1.68414 *	0	0.014965 *	1.6619	0.0937211
Hexane	4.99805 *	0	0.0409023 *	4.83338	0.327953
2,2-Dimethylpentane	0.0460398 *	0	0.000587127 *	0.0439761	0.0040112
Methylcyclopentane	0.669548 *	0	0.00430988 *	0.639566	0.0469808
2,4-Dimethylpentane	0.161383 *	0	0 *	0.147189	0.0141939
Benzene	0.0930937 *	0	0.000453643 *	0.0882501	0.0068533
3,3-Dimethylpentane	0.033116 *	0	0 *	0.0296542	0.00346184
Cyclohexane	0.683296 *	0	0.00388198 *	0.637501	0.0595839
2-Methylhexane	1.14298 *	0	0.00992302 *	1.0236	0.14236
2,3-Dimethylpentane	0.247726 *	0	0.00244886 *	0.223696	0.0300242
3-Methylhexane	1.3446 *	0	0.0147349 *	1.20044	0.177339
3-Ethylpentane	0.137779 *	0	0.00107791 *	0.121439	0.0187366
2,2,4-Trimethylpentane	0.136327 *	0	0.00127888 *	0.118841	0.0202608
Heptane	2.79056 *	0	0.0224092 *	2.3966	0.439476
Methylcyclohexane	1.72512 *	0	0.0114858 *	1.46561	0.282263
2,5-Dimethylhexane	0.13114 *	0	0.000987601 *	0.104706	0.0280635
2,4-Dimethylhexane	0.158699 *	0	0 *	0.125326	0.0333733
Ethylcyclopentane	0 *	0	0.00184479 *	0.00269829	0.000589883
Toluene	0.257888 *	0	0.00199637 *	0.211794	0.0498086
2-Methylheptane	0.947742 *	0	0.00674225 *	0.696226	0.260937
4-Methylheptane	0.382995 *	0	0.00261839 *	0.279207	0.107474
3-Methylheptane	0.694993 *	0	0.00483101 *	0.500788	0.200933
cis-1,3-Dimethylcyclohexane	0.288296 *	0	0.00265603 *	0.211531	0.0804371
Octane	1.17833 *	0	0.00933063 *	0.791861	0.398641
trans-1,2-Dimethylcyclohexane	0.0995525 *	0	0.00071744 *	0.0707114	0.0298036
trans-1,3-Dimethylcyclohexane	0.117135 *	0	0.000248263 *	0.0810613	0.0363984
cis-1,2-Dimethylcyclohexane	0.154422 *	0	0 *	0.100645	0.0537765
Ethylcyclohexane	0.197309 *	0	0.00147666 *	0.140912	0.0584294
Ethylbenzene	0.0619157 *	0	0.000243817 *	0.0380544	0.0241665
m-Xylene	0.97029 *	0	0.00188445 *	0.558368	0.414194
o-Xylene	0.0444931 *	0	0.000281325 *	0.0245008	0.0203248
Nonane	0.562571 *	0	0.00269539 *	0.242482	0.322985

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? Extrapolated or Approximate Values

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**Process Streams Report**  
**All Streams**  
 Tabulated by Total Phase

Client Name		Job
Location		
Flowsheet	Flowsheet1	

Molar Flow	Condensate Ave lbmol/h	Non-VOCs lbmol/h	Pigged Liquids lbmol/h	To Flare lbmol/h	Trucked Liquid lbmol/h
Cumene	0.0799818 *	0	0.000224361 *	0.0333776	0.0468477
Cyclooctane	0.0535863 *	0	0.000384961 *	0.0259708	0.0280431
Propylcyclohexane	0.0927733 *	0	0.00052003 *	0.0367665	0.0565699
Propylbenzene	0.032248 *	0	0 *	0.0118601	0.0203878
Mesitylene	0.132819 *	0	0.000520137 *	0.0417883	0.0915824
tert-Butylbenzene	0 *	0	0.000300368 *	8.48746E-05	0.000226252
1,2,4-Trimethylbenzene	0.0712744 *	0	0 *	0.0205546	0.0507199
Cyclohexane, Isobutyl-	0.18639 *	0	0 *	0.0549437	0.131446
Decane	0.0887915 *	0	0.000910135 *	0.0197796	0.0699493
Isobutylbenzene	0.0662414 *	0	0 *	0.0175286	0.0487128
sec-Butylbenzene	0.0612147 *	0	0 *	0.0139307	0.047284
1,2,3-Trimethylbenzene	0.150279 *	0	0 *	0.0386197	0.111659
Cyclohexane, Butyl-	0.0389075 *	0	0 *	0.00744224	0.0314653
Butylbenzene	0.106985 *	0	0 *	0.0181386	0.0888459
Water	0 *	0	0.000162461 *	17.4958	63.4917

Mass Fraction	Condensate Ave %	Non-VOCs %	Pigged Liquids %	To Flare %	Trucked Liquid %
Nitrogen	0 *		0.053146 *	0.000426247	1.11127E-07
Carbon Dioxide	0.0226823 *		0.0922459 *	0.226231	0.000638173
Methane	0.685202 *		9.31703 *	1.05966	0.00086997
Ethane	4.01218 *		14.5218 *	25.123	0.104758
Propane	13.5844 *		18.3847 *	20.0437	0.257844
Isobutane	4.17037 *		4.28894 *	3.88155	0.116939
Butane	15.115 *		13.9057 *	12.3709	0.516173
Isopentane	6.23869 *		5.37203 *	4.33094	0.417289
Pentane	8.78638 *		7.92716 *	5.92503	0.737803
2,2-Dimethylbutane	0.519271 *		0.243441 *	0.317319	0.0612013
2,3-Dimethylbutane	0 *		0.501673 *	0.0220338	0.00558739
Cyclopentane	0.767584 *		0 *	0.449411	0.0804624
2-Methylpentane	4.14224 *		2.7689 *	2.4953	0.683271
3-Methylpentane	2.61443 *		1.75216 *	1.56064	0.474663
Hexane	7.75888 *		4.789 *	4.53889	1.66096
2,2-Dimethylpentane	0.0831044 *		0.0799322 *	0.0480185	0.0236219
Methylcyclopentane	1.01508 *		0.492812 *	0.586549	0.232374
2,4-Dimethylpentane	0.291306 *		0 *	0.160719	0.0835878
Benzene	0.130994 *		0.0481443 *	0.0751187	0.0314617
3,3-Dimethylpentane	0.0597763 *		0 *	0.0323801	0.0203868
Cyclohexane	1.03592 *		0.443884 *	0.584655	0.294711
2-Methylhexane	2.06314 *		1.35093 *	1.1177	0.83836
2,3-Dimethylpentane	0.44716 *		0.333391 *	0.244258	0.176813
3-Methylhexane	2.42708 *		2.00603 *	1.31078	1.04435
3-Ethylpentane	0.2487 *		0.146749 *	0.132602	0.11034
2,2,4-Trimethylpentane	0.280525 *		0.198481 *	0.147931	0.136018
Heptane	5.03712 *		3.05082 *	2.6169	2.58807
Methylcyclohexane	3.05129 *		1.53223 *	1.56813	1.6288
2,5-Dimethylhexane	0.269852 *		0.153274 *	0.130335	0.1884
2,4-Dimethylhexane	0.32656 *		0 *	0.156002	0.224047
Ethylcyclopentane	0 *		0.246099 *	0.00288705	0.00340393
Toluene	0.428043 *		0.249916 *	0.212653	0.269718
2-Methylheptane	1.9502 *		1.04639 *	0.866644	1.75176
4-Methylheptane	0.788102 *		0.406371 *	0.34755	0.721509
3-Methylheptane	1.43011 *		0.749767 *	0.623367	1.34893
cis-1,3-Dimethylcyclohexane	0.582767 *		0.404937 *	0.258661	0.530473
Octane	2.42469 *		1.4481 *	0.985688	2.67622
trans-1,2-Dimethylcyclohexane	0.201238 *		0.109381 *	0.0864663	0.196551
trans-1,3-Dimethylcyclohexane	0.23678 *		0.0378501 *	0.0991222	0.240043
cis-1,2-Dimethylcyclohexane	0.312151 *		0 *	0.123069	0.35465
Ethylcyclohexane	0.398845 *		0.225131 *	0.172308	0.385335

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Process Streams Report All Streams Tabulated by Total Phase					
Client Name					Job
Location					
Flowsheet	Flowsheet1				
Mass Fraction	Condensate Ave %	Non-VOCs %	Pigged Liquids %	To Flare %	Trucked Liquid %
Ethylbenzene	0.118412 *		0.0351689 *	0.0440252	0.150786
m-Xylene	1.85566 *		0.271818 *	0.645978	2.58435
o-Xylene	0.085092 *		0.0405792 *	0.028345	0.126815
Nonane	1.29977 *		0.469688 *	0.338898	2.43457
Cumene	0.173173 *		0.0366384 *	0.0437164	0.330924
Cyclooctane	0.108321 *		0.058691 *	0.0317573	0.184941
Propylcyclohexane	0.210976 *		0.0891942 *	0.0505781	0.419706
Propylbenzene	0.0698218 *		0 *	0.0155339	0.144016
Mesitylene	0.287575 *		0.0849387 *	0.0547324	0.646921
tert-Butylbenzene	0 *		0.0547745 *	0.000124138	0.00178471
1,2,4-Trimethylbenzene	0.15432 *		0 *	0.0269214	0.358276
Cyclohexane, Isobutyl-	0.470966 *		0 *	0.0839818	1.08359
Decane	0.227581 *		0.175942 *	0.0306678	0.584921
Isobutylbenzene	0.160161 *		0 *	0.0256373	0.384255
sec-Butylbenzene	0.148007 *		0 *	0.0203751	0.372984
1,2,3-Trimethylbenzene	0.325377 *		0 *	0.0505824	0.788739
Cyclohexane, Butyl-	0.0983105 *		0 *	0.0113755	0.259387
Butylbenzene	0.258671 *		0 *	0.0265297	0.700832
Water	0 *		0.00397652 *	3.43472	67.2238
Mass Flow	Condensate Ave lb/h	Non-VOCs lb/h	Pigged Liquids lb/h	To Flare lb/h	Trucked Liquid lb/h
Nitrogen	0 *	0	0.0391162 *	0.0391152	1.89084E-06
Carbon Dioxide	1.25913 *	0	0.0678943 *	20.7604	0.0108586
Methane	38.0367 *	0	6.85747 *	97.2415	0.0148026
Ethane	222.723 *	0	10.6883 *	2305.45	1.78247
Propane	754.647 *	0	13.5314 *	1839.34	4.38724
Isobutane	231.504 *	0	3.15672 *	356.197	1.98973
Butane	839.059 *	0	10.2348 *	1135.24	8.78273
Isopentane	346.32 *	0	3.95389 *	397.435	7.10022
Pentane	487.747 *	0	5.8345 *	543.719	12.5538
2,2-Dimethylbutane	28.8256 *	0	0.179176 *	29.1193	1.04135
2,3-Dimethylbutane	0 *	0	0.369239 *	2.02197	0.0950702
Cyclopentane	42.6099 *	0	0 *	41.2408	1.36908
2-Methylpentane	229.943 *	0	2.03795 *	228.985	11.6259
3-Methylpentane	145.132 *	0	1.28961 *	143.215	8.07645
Hexane	430.709 *	0	3.52477 *	416.518	28.2614
2,2-Dimethylpentane	4.61327 *	0	0.0588312 *	4.40649	0.40193
Methylcyclopentane	56.3488 *	0	0.362717 *	53.8255	3.95388
2,4-Dimethylpentane	16.1709 *	0	0 *	14.7487	1.42226
Benzene	7.27172 *	0	0.0354349 *	6.89338	0.535324
3,3-Dimethylpentane	3.31829 *	0	0 *	2.97141	0.346883
Cyclohexane	57.5058 *	0	0.326705 *	53.6518	5.01455
2-Methylhexane	114.529 *	0	0.994306 *	102.567	14.2648
2,3-Dimethylpentane	24.8226 *	0	0.245381 *	22.4147	3.00849
3-Methylhexane	134.732 *	0	1.47647 *	120.286	17.7697
3-Ethylpentane	13.8058 *	0	0.108009 *	12.1684	1.87744
2,2,4-Trimethylpentane	15.5724 *	0	0.146085 *	13.5751	2.31436
Heptane	279.62 *	0	2.24545 *	240.144	44.0364
Methylcyclohexane	169.383 *	0	1.12775 *	143.902	27.7143
2,5-Dimethylhexane	14.98 *	0	0.112812 *	11.9604	3.20565
2,4-Dimethylhexane	18.1279 *	0	0 *	14.3158	3.81218
Ethylcyclopentane	0 *	0	0.181133 *	0.264935	0.0579183
Toluene	23.7614 *	0	0.183942 *	19.5144	4.58928
2-Methylheptane	108.259 *	0	0.770158 *	79.5289	29.8065
4-Methylheptane	43.7489 *	0	0.299095 *	31.8934	12.2766
3-Methylheptane	79.388 *	0	0.551839 *	57.2042	22.9523
cis-1,3-Dimethylcyclohexane	32.3504 *	0	0.29804 *	23.7365	9.02605
Octane	134.599 *	0	1.06582 *	90.4531	45.5362

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**Process Streams Report**  
**All Streams**  
 Tabulated by Total Phase

Client Name		Job
Location		
Flowsheet	Flowsheet1	

Mass Flow	Condensate Ave lb/h	Non-VOCs lb/h	Pigged Liquids lb/h	To Flare lb/h	Trucked Liquid lb/h
trans-1,2-Dimethylcyclohexane	11.171 *	0	0.0805059 *	7.93471	3.34434
trans-1,3-Dimethylcyclohexane	13.144 *	0	0.0278582 *	9.0961	4.08436
cis-1,2-Dimethylcyclohexane	17.3281 *	0	0 *	11.2936	6.03441
Ethylcyclohexane	22.1406 *	0	0.165699 *	15.8121	6.55651
Ethylbenzene	6.57328 *	0	0.0258848 *	4.04004	2.56564
m-Xylene	103.011 *	0	0.200062 *	59.2792	43.9729
o-Xylene	4.72361 *	0	0.0298669 *	2.60112	2.15778
Nonane	72.1526 *	0	0.345697 *	31.0995	41.4245
Cumene	9.61314 *	0	0.0269664 *	4.0117	5.6307
Cyclooctane	6.01306 *	0	0.0431975 *	2.91426	3.14679
Propylcyclohexane	11.7116 *	0	0.0656482 *	4.64138	7.14134
Propylbenzene	3.87593 *	0	0 *	1.42549	2.45044
Mesitylene	15.9638 *	0	0.0625161 *	5.02261	11.0074
tert-Butylbenzene	0 *	0	0.0403148 *	0.0113917	0.0303671
1,2,4-Trimethylbenzene	8.56659 *	0	0 *	2.47048	6.0961
Cyclohexane, Isobutyl-	26.1441 *	0	0 *	7.70672	18.4374
Decane	12.6334 *	0	0.129496 *	2.81428	9.9525
Isobutylbenzene	8.8908 *	0	0 *	2.35265	6.53815
sec-Butylbenzene	8.21613 *	0	0 *	1.86976	6.34637
1,2,3-Trimethylbenzene	18.0622 *	0	0 *	4.64177	13.4205
Cyclohexane, Butyl-	5.45739 *	0	0 *	1.04389	4.4135
Butylbenzene	14.3593 *	0	0 *	2.43454	11.9247
Water	0 *	0	0.00292677 *	315.192	1143.82

**Stream Properties**

Property	Units	Condensate Ave	Non-VOCs	Pigged Liquids	To Flare	Trucked Liquid
Temperature	°F	70 *	70	70 *	120	70
Pressure	psia	20 *	14.7	20 *	19.7	14.7
Mole Fraction Vapor	%	49.181		89.6205	100	0
Mole Fraction Light Liquid	%	50.819		10.3795	0	7.83579
Mole Fraction Heavy Liquid	%	0		0	0	92.1642
Molecular Weight	lb/lbmol	66.2324		44.3692	45.0101	24.6996
Mass Density	lb/ft^3	0.483897		0.177262	0.145223	55.7372
Molar Flow	lbmol/h	83.8135	0	1.65884	203.88	68.8883
Mass Flow	lb/h	5551.18	0	73.6014	9176.65	1701.51
Vapor Volumetric Flow	ft^3/h	11471.8		415.212	63190.1	30.5274
Liquid Volumetric Flow	gpm	1430.25		51.7667	7878.24	3.80601
Std Vapor Volumetric Flow	MMSCFD	0.763343	0	0.0151081	1.85686	0.627409
Std Liquid Volumetric Flow	sgpm	18.2033 *	0	0.291667 *	35.8097	3.80521
Compressibility		0.481591		0.880696	0.981514	0.00114602
Specific Gravity					1.55408	0.893669
API Gravity						26.3497
Enthalpy	Btu/h	-5.31849E+06 ?	0	-79553.3	-1.04517E+07	-8.24038E+06
Mass Enthalpy	Btu/lb	-958.083 ?		-1080.87	-1138.94	-4842.98
Mass Cp	Btu/(lb*°F)	0.466128 ?		0.433636	0.428528	0.815446 ?
Ideal Gas Cp/Cv Ratio		1.08478		1.12426	1.1158	1.23747
Dynamic Viscosity	cP				0.00912938	0.795975
Kinematic Viscosity	cSt				3.9245	0.868562
Thermal Conductivity	Btu/(h*ft*°F)				0.0119225	0.236661
Surface Tension	lb/ft					0.00363083 ?
Net Ideal Gas Heating Value	Btu/ft^3	3392.3		2316.98	2261.39	403.362
Net Liquid Heating Value	Btu/lb	19260.4		19661.2	18869.8	5425.06
Gross Ideal Gas Heating Value	Btu/ft^3	3665.86		2517.45	2458.57	479.004
Gross Liquid Heating Value	Btu/lb	20826.2		21374.8	20531.5	6586.6

**Remarks**

		<b>Process Streams Report</b> <b>All Streams</b> Tabulated by Total Phase		
Client Name			.Job	
Location				
Flowsheet	Flowsheet1			

Process Streams Report All Streams Tabulated by Total Phase					
Client Name				Job	
Location					
Flowsheet		Flowsheet.1			
Connections					
From Block	VOCs	Water	Y Grade Ave	1	2
	DVDR-1	--	--	MIX-100	Common Heat Loss
To Block	--	MIX-100	MIX-100	Not Real	Common Closed Drain Tank
Stream Composition					
Mole Fraction	VOCs %	Water %	Y Grade Ave %	1 %	2 %
Nitrogen		0 *	2.98526E-08 *	0.000511927	0.000511927
Carbon Dioxide		0 *	0.415602 *	0.173031	0.173031
Methane		0 *	3.07029 *	2.22256	2.22256
Ethane		0 *	64.8761 *	28.1305	28.1305
Propane		0 *	22.9439 *	15.3288	15.3288
Isobutane		0 *	1.99916 *	2.2593	2.2593
Butane		0 *	4.76992 *	7.21603	7.21603
Isopentane		0 *	0.707447 *	2.05558	2.05558
Pentane		0 *	0.817352 *	2.82661	2.82661
2,2-Dimethylbutane		0 *	0.0126166 *	0.128311	0.128311
2,3-Dimethylbutane		0 *	0.0190784 *	0.00900643	0.00900643
Cyclopentane		0 *	0 *	0.222739	0.222739
2-Methylpentane		0 *	0.0942056 *	1.02362	1.02362
3-Methylpentane		0 *	0.0531562 *	0.643631	0.643631
Hexane		0 *	0.115113 *	1.89221	1.89221
2,2-Dimethylpentane		0 *	0.00127966 *	0.0175927	0.0175927
Methylcyclopentane		0 *	0.0119356 *	0.251696	0.251696
2,4-Dimethylpentane		0 *	0 *	0.059165	0.059165
Benzene		0 *	0.00146374 *	0.0348661	0.0348661
3,3-Dimethylpentane		0 *	0 *	0.0121407	0.0121407
Cyclohexane		0 *	0.00931938 *	0.25556	0.25556
2-Methylhexane		0 *	0.0122869 *	0.427457	0.427457
2,3-Dimethylpentane		0 *	0.00333488 *	0.0930168	0.0930168
3-Methylhexane		0 *	0.0173447 *	0.505108	0.505108
3-Ethylpentane		0 *	0.00124019 *	0.0513901	0.0513901
2,2,4-Trimethylpentane		0 *	0.00140761 *	0.0509965	0.0509965
Heptane		0 *	0.0217354 *	1.03974	1.03974
Methylcyclohexane		0 *	0.0105961 *	0.64079	0.64079
2,5-Dimethylhexane		0 *	0.000603232 *	0.0486748	0.0486748
2,4-Dimethylhexane		0 *	0 *	0.0581809	0.0581809
Ethylcyclopentane		0 *	0.00135774 *	0.00120549	0.00120549
Toluene		0 *	0.0016161 *	0.0959068	0.0959068
2-Methylheptane		0 *	0.00251986 *	0.350908	0.350908
4-Methylheptane		0 *	0.00100459 *	0.141762	0.141762
3-Methylheptane		0 *	0.00178397 *	0.257259	0.257259
cis-1,3-Dimethylcyclohexane		0 *	0.000956205 *	0.107039	0.107039
Octane		0 *	0.00267293 *	0.436452	0.436452
trans-1,2-Dimethylcyclohexane		0 *	0.000230489 *	0.03685	0.03685
trans-1,3-Dimethylcyclohexane		0 *	7.16911E-05 *	0.0430621	0.0430621
cis-1,2-Dimethylcyclohexane		0 *	0 *	0.0566128	0.0566128
Ethylcyclohexane		0 *	0.000522728 *	0.073081	0.073081
Ethylbenzene		0 *	5.76694E-05 *	0.0228109	0.0228109
m-Xylene		0 *	0.000365207 *	0.356553	0.356553
o-Xylene		0 *	4.81E-05 *	0.0164336	0.0164336
Nonane		0 *	0.000188117 *	0.207307	0.207307
Cumene		0 *	1.80325E-05 *	0.0294116	0.0294116
Cyclooctane		0 *	4.00963E-05 *	0.0198022	0.0198022
Propylcyclohexane		0 *	4.05606E-05 *	0.0342183	0.0342183
Propylbenzene		0 *	0 *	0.0118225	0.0118225
Mesitylene		0 *	2.9317E-05 *	0.0488953	0.0488953
tert-Butylbenzene		0 *	1.01198E-05 *	0.000114063	0.000114063

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Process Streams Report All Streams Tabulated by Total Phase		
Client Name		Job
Location		
Flowsheet	Flowsheet1	

## Stream Composition

Mole Fraction	VOCs %	Water %	Y Grade Ave %	1 %	2 %
1,2,4-Trimethylbenzene		0 *	0 *	0.0261301	0.0261301
Cyclohexane, Isobutyl-		0 *	0 *	0.0683328	0.0683328
Decane		0 *	2.56051E-05 *	0.0328957	0.0328957
Isobutylbenzene		0 *	0 *	0.0242849	0.0242849
sec-Butylbenzene		0 *	0 *	0.0224421	0.0224421
1,2,3-Trimethylbenzene		0 *	0 *	0.055094	0.055094
Cyclohexane, Butyl-		0 *	0 *	0.014264	0.014264
Butylbenzene		0 *	0 *	0.0392218	0.0392218
Water		100 *	0 *	29.691	29.691

Molar Flow	VOCs lbmol/h	Water lbmol/h	Y Grade Ave lbmol/h	1 lbmol/h	2 lbmol/h
Nitrogen	0	0 *	3.17357E-08 *	0.00139637	0.00139637
Carbon Dioxide	0	0 *	0.441819 *	0.471972	0.471972
Methane	0	0 *	3.26397 *	6.06243	6.06243
Ethane	0	0 *	68.9686 *	76.7311	76.7311
Propane	0	0 *	24.3912 *	41.812	41.812
Isobutane	0	0 *	2.12527 *	6.16264	6.16264
Butane	0	0 *	5.07081 *	19.683	19.683
Isopentane	0	0 *	0.752074 *	5.60696	5.60696
Pentane	0	0 *	0.868912 *	7.71008	7.71008
2,2-Dimethylbutane	0	0 *	0.0134125 *	0.349992	0.349992
2,3-Dimethylbutane	0	0 *	0.0202819 *	0.0245666	0.0245666
Cyclopentane	0	0 *	0 *	0.60756	0.60756
2-Methylpentane	0	0 *	0.100148 *	2.79211	2.79211
3-Methylpentane	0	0 *	0.0565094 *	1.75562	1.75562
Hexane	0	0 *	0.122374 *	5.16133	5.16133
2,2-Dimethylpentane	0	0 *	0.00136038 *	0.0479873	0.0479873
Methylcyclopentane	0	0 *	0.0126885 *	0.686547	0.686547
2,4-Dimethylpentane	0	0 *	0 *	0.161383	0.161383
Benzene	0	0 *	0.00155607 *	0.0951034	0.0951034
3,3-Dimethylpentane	0	0 *	0 *	0.033116	0.033116
Cyclohexane	0	0 *	0.00990726 *	0.697085	0.697085
2-Methylhexane	0	0 *	0.0130619 *	1.16596	1.16596
2,3-Dimethylpentane	0	0 *	0.00354524 *	0.25372	0.25372
3-Methylhexane	0	0 *	0.0184388 *	1.37777	1.37777
3-Ethylpentane	0	0 *	0.00131842 *	0.140176	0.140176
2,2,4-Trimethylpentane	0	0 *	0.0014964 *	0.139102	0.139102
Heptane	0	0 *	0.0231065 *	2.83608	2.83608
Methylcyclohexane	0	0 *	0.0112645 *	1.74787	1.74787
2,5-Dimethylhexane	0	0 *	0.000641285 *	0.132769	0.132769
2,4-Dimethylhexane	0	0 *	0 *	0.158699	*0.158699
Ethylcyclopentane	0	0 *	0.00144339 *	0.00328818	0.00328818
Toluene	0	0 *	0.00171805 *	0.261603	0.261603
2-Methylheptane	0	0 *	0.00267881 *	0.957164	0.957164
4-Methylheptane	0	0 *	0.00106796 *	0.386681	0.386681
3-Methylheptane	0	0 *	0.0018965 *	0.701721	0.701721
cis-1,3-Dimethylcyclohexane	0	0 *	0.00101652 *	0.291968	0.291968
Octane	0	0 *	0.00284154 *	1.1905	1.1905
trans-1,2-Dimethylcyclohexane	0	0 *	0.000245029 *	0.100515	0.100515
trans-1,3-Dimethylcyclohexane	0	0 *	7.62135E-05 *	0.11746	0.11746
cis-1,2-Dimethylcyclohexane	0	0 *	0 *	0.154422	0.154422
Ethylcyclohexane	0	0 *	0.000555703 *	0.199342	0.199342
Ethylbenzene	0	0 *	6.13073E-05 *	0.0622209	0.0622209
m-Xylene	0	0 *	0.000388245 *	0.972563	0.972563
o-Xylene	0	0 *	5.11343E-05 *	0.0448255	0.0448255
Nonane	0	0 *	0.000199984 *	0.565467	0.565467
Cumene	0	0 *	1.91701E-05 *	0.0802253	0.0802253
Cyclooctane	0	0 *	4.26257E-05 *	0.0540139	0.0540139

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Process Streams Report All Streams Tabulated by Total Phase					
Client Name					Job
Location					
Flowsheet	Flowsheet1				
Molar Flow	VOCs lbmol/h	Water lbmol/h	Y Grade Ave lbmol/h	1 lbmol/h	2 lbmol/h
Propylcyclohexane	0	0 *	4.31192E-05 *	0.0933364	0.0933364
Propylbenzene	0	0 *	0	0.032248	0.032248
Mesitylene	0	0 *	3.11663E-05 *	0.133371	0.133371
tert-Butylbenzene	0	0 *	1.07581E-05 *	0.000311126	0.000311126
1,2,4-Trimethylbenzene	0	0 *	0	0.0712744	0.0712744
Cyclohexane, Isobutyl-	0	0 *	0	0.18639	0.18639
Decane	0	0 *	2.72204E-05 *	0.0897289	0.0897289
Isobutylbenzene	0	0 *	0	0.0662414	0.0662414
sec-Butylbenzene	0	0 *	0	0.0612147	0.0612147
1,2,3-Trimethylbenzene	0	0 *	0	0.150279	0.150279
Cyclohexane, Butyl-	0	0 *	0	0.0389075	0.0389075
Butylbenzene	0	0 *	0	0.106985	0.106985
Water	0	80.9874 *	0	80.9875	80.9875
Mass Fraction	VOCs %	Water %	Y Grade Ave %	1 %	2 %
Nitrogen		0 *	2.34301E-08 *	0.000359593	0.000359593
Carbon Dioxide		0 *	0.512448 *	0.190944	0.190944
Methane		0 *	1.37999 *	0.894051	0.894051
Ethane		0 *	54.6551 *	21.2097	21.2097
Propane		0 *	28.3458 *	16.9489	16.9489
Isobutane		0 *	3.25548 *	3.29271	3.29271
Butane		0 *	7.76747 *	10.5167	10.5167
Isopentane		0 *	1.43004 *	3.71879	3.71879
Pentane		0 *	1.65221 *	5.11366	5.11366
2,2-Dimethylbutane		0 *	0.0304615 *	0.277259	0.277259
2,3-Dimethylbutane		0 *	0.0460629 *	0.0194614	0.0194614
Cyclopentane		0 *	0	0.391701	0.391701
2-Methylpentane		0 *	0.22745 *	2.21187	2.21187
3-Methylpentane		0 *	0.12834 *	1.39078	1.39078
Hexane		0 *	0.277928 *	4.08874	4.08874
2,2-Dimethylpentane		0 *	0.00359249 *	0.0442025	0.0442025
Methylcyclopentane		0 *	0.0281431 *	0.53115	0.53115
2,4-Dimethylpentane		0 *	0	0.148655	0.148655
Benzene		0 *	0.00320336 *	0.0682901	0.0682901
3,3-Dimethylpentane		0 *	0	0.0305041	0.0305041
Cyclohexane		0 *	0.0219744 *	0.539304	0.539304
2-Methylhexane		0 *	0.034494 *	1.074	1.074
2,3-Dimethylpentane		0 *	0.00936229 *	0.233709	0.233709
3-Methylhexane		0 *	0.0486933 *	1.26911	1.26911
3-Ethylpentane		0 *	0.00348169 *	0.12912	0.12912
2,2,4-Trimethylpentane		0 *	0.00450487 *	0.146067	0.146067
Heptane		0 *	0.0610196 *	2.61239	2.61239
Methylcyclohexane		0 *	0.0291489 *	1.57762	1.57762
2,5-Dimethylhexane		0 *	0.00193057 *	0.139417	0.139417
2,4-Dimethylhexane		0 *	0	0.166645	0.166645
Ethylcyclopentane		0 *	0.00373502 *	0.0029679	0.0029679
Toluene		0 *	0.00417192 *	0.221579	0.221579
2-Methylheptane		0 *	0.00806449 *	1.00509	1.00509
4-Methylheptane		0 *	0.00321507 *	0.406043	0.406043
3-Methylheptane		0 *	0.00570936 *	0.736857	0.736857
cis-1,3-Dimethylcyclohexane		0 *	0.00300621 *	0.301177	0.301177
Octane		0 *	0.00855438 *	1.25011	1.25011
trans-1,2-Dimethylcyclohexane		0 *	0.000724634 *	0.103685	0.103685
trans-1,3-Dimethylcyclohexane		0 *	0.000225389 *	0.121164	0.121164
cis-1,2-Dimethylcyclohexane		0 *	0	0.159292	0.159292
Ethylcyclohexane		0 *	0.0016434 *	0.205629	0.205629
Ethylbenzene		0 *	0.000171535 *	0.0607242	0.0607242
m-Xylene		0 *	0.00108629 *	0.949169	0.949169
o-Xylene		0 *	0.000143071 *	0.0437473	0.0437473
Nonane		0 *	0.000675974 *	0.666693	0.666693

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Process Streams Report All Streams Tabulated by Total Phase					
Client Name					Job
Location					
Flowsheet	Flowsheet1				
Mass Fraction	VOCs %	Water %	Y Grade Ave %	1 %	2 %
Cumene		0 *	6.07236E-05 *	0.08864	0.08864
Cyclooctane		0 *	0.000126059 *	0.0557175	0.0557175
Propylcyclohexane		0 *	0.000143458 *	0.108315	0.108315
Propylbenzene		0 *	0 *	0.0356304	0.0356304
Mesitylene		0 *	9.87233E-05 *	0.14736	0.14736
tert-Butylbenzene		0 *	3.80547E-05 *	0.000383877	0.000383877
1,2,4-Trimethylbenzene		0 *	0 *	0.0787503	0.0787503
Cyclohexane, Isobutyl-		0 *	0 *	0.240336	0.240336
Decane		0 *	0.000102071 *	0.117362	0.117362
Isobutylbenzene		0 *	0 *	0.0817307	0.0817307
sec-Butylbenzene		0 *	0 *	0.0755286	0.0755286
1,2,3-Trimethylbenzene		0 *	0 *	0.166041	0.166041
Cyclohexane, Butyl-		0 *	0 *	0.0501683	0.0501683
Butylbenzene		0 *	0 *	0.132001	0.132001
Water		100 *	0 *	13.4123	13.4123
Mass Flow	VOCs lb/h	Water lb/h	Y Grade Ave lb/h	1 lb/h	2 lb/h
Nitrogen	0	0 *	8.89025E-07 *	0.0391171	0.0391171
Carbon Dioxide	0	0 *	19.4442 *	20.7712	20.7712
Methane	0	0 *	52.3621 *	97.2563	97.2563
Ethane	0	0 *	2073.82 *	2307.23	2307.23
Propane	0	0 *	1075.55 *	1843.72	1843.72
Isobutane	0	0 *	123.525 *	358.186	358.186
Butane	0	0 *	294.727 *	1144.02	1144.02
Isopentane	0	0 *	54.2612 *	404.536	404.536
Pentane	0	0 *	62.6909 *	556.273	556.273
2,2-Dimethylbutane	0	0 *	1.15582 *	30.1606	30.1606
2,3-Dimethylbutane	0	0 *	1.7478 *	2.11704	2.11704
Cyclopentane	0	0 *	0 *	42.6099	42.6099
2-Methylpentane	0	0 *	8.63031 *	240.611	240.611
3-Methylpentane	0	0 *	4.86972 *	151.291	151.291
Hexane	0	0 *	10.5456 *	444.779	444.779
2,2-Dimethylpentane	0	0 *	0.136313 *	4.80842	4.80842
Methylcyclopentane	0	0 *	1.06786 *	57.7794	57.7794
2,4-Dimethylpentane	0	0 *	0 *	16.1709	16.1709
Benzene	0	0 *	0.121548 *	7.4287	7.4287
3,3-Dimethylpentane	0	0 *	0 *	3.31829	3.31829
Cyclohexane	0	0 *	0.83379 *	58.6663	58.6663
2-Methylhexane	0	0 *	1.30883 *	116.832	116.832
2,3-Dimethylpentane	0	0 *	0.35524 *	25.4232	25.4232
3-Methylhexane	0	0 *	1.84761 *	138.056	138.056
3-Ethylpentane	0	0 *	0.132108 *	14.0459	14.0459
2,2,4-Trimethylpentane	0	0 *	0.170932 *	15.8894	15.8894
Heptane	0	0 *	2.31531 *	284.18	284.18
Methylcyclohexane	0	0 *	1.10602 *	171.616	171.616
2,5-Dimethylhexane	0	0 *	0.073253 *	15.166	15.166
2,4-Dimethylhexane	0	0 *	0 *	18.1279	18.1279
Ethylcyclopentane	0	0 *	0.141721 *	0.322853	0.322853
Toluene	0	0 *	0.158298 *	24.1037	24.1037
2-Methylheptane	0	0 *	0.305997 *	109.335	109.335
4-Methylheptane	0	0 *	0.121992 *	44.17	44.17
3-Methylheptane	0	0 *	0.216635 *	80.1565	80.1565
cis-1,3-Dimethylcyclohexane	0	0 *	0.114067 *	32.7625	32.7625
Octane	0	0 *	0.324585 *	135.989	135.989
trans-1,2-Dimethylcyclohexane	0	0 *	0.0274953 *	11.279	11.279
trans-1,3-Dimethylcyclohexane	0	0 *	0.00855212 *	13.1805	13.1805
cis-1,2-Dimethylcyclohexane	0	0 *	0 *	17.3281	17.3281
Ethylcyclohexane	0	0 *	0.0623569 *	22.3686	22.3686
Ethylbenzene	0	0 *	0.00650869 *	6.60568	6.60568
m-Xylene	0	0 *	0.041218 *	103.252	103.252

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**Process Streams Report**  
**All Streams**  
 Tabulated by Total Phase

Client Name		Job
Location		
Flowsheet	Flowsheet1	

Mass Flow	VOCs lb/h	Water lb/h	Y Grade Ave lb/h	1 lb/h	2 lb/h
o-Xylene	0	0 *	0.00542867 *	4.7589	4.7589
Nonane	0	0 *	0.025649 *	72.524	72.524
Cumene	0	0 *	0.00230408 *	9.64241	9.64241
Cyclooctane	0	0 *	0.00478314 *	6.06104	6.06104
Propylcyclohexane	0	0 *	0.00544334 *	11.7827	11.7827
Propylbenzene	0	0 *	0	3.87593	3.87593
Mesitylene	0	0 *	0.00374593 *	16.03	16.03
tert-Butylbenzene	0	0 *	0.00144394 *	0.0417588	0.0417588
1,2,4-Trimethylbenzene	0	0 *	0	8.56659	8.56659
Cyclohexane, Isobutyl-	0	0 *	0	26.1441	26.1441
Decane	0	0 *	0.00387296 *	12.7668	12.7668
Isobutylbenzene	0	0 *	0	8.8908	8.8908
sec-Butylbenzene	0	0 *	0	8.21613	8.21613
1,2,3-Trimethylbenzene	0	0 *	0	18.0622	18.0622
Cyclohexane, Butyl-	0	0 *	0	5.45739	5.45739
Butylbenzene	0	0 *	0	14.3593	14.3593
Water	0	1459.01 *	0	1459.01	1459.01

**Stream Properties**

Property	Units	VOCs	Water	Y Grade Ave	1	2
Temperature	°F	70	70 *	70 *	49.7529	120 *
Pressure	psia	14.7	20 *	20 *	20	19.7
Mole Fraction Vapor	%		0	100	57.888	74.7447
Mole Fraction Light Liquid	%		100	0	12.9326	1.98129
Mole Fraction Heavy Liquid	%		0	0	29.1794	23.274
Molecular Weight	lb/lbmol		18.0153	35.6922	39.8807	39.8807
Mass Density	lb/ft^3		62.2764	0.127622	0.25726	0.172065
Molar Flow	lbmol/h	0	80.9874	106.308	272.768	272.768
Mass Flow	lb/h	0	1459.01	3794.38	10878.2	10878.2
Vapor Volumetric Flow	ft^3/h		23.428	29731.3	42284.8	63221.2
Liquid Volumetric Flow	gpm		2.92089	3706.76	5271.87	7882.12
Std Vapor Volumetric Flow	MMSCFD	0	0.737603	0.968215	2.48427	2.48427
Std Liquid Volumetric Flow	sgpm	0	2.91667 *	18.2033 *	39.6149	39.6149
Compressibility			0.00101784	0.984029	0.567124	0.733991
Specific Gravity			0.998515	1.23236		
API Gravity			10.0111			
Enthalpy	Btu/h	0	-9.96278E+06	-4.31604E+06	-1.96769E+07	-1.86222E+07
Mass Enthalpy	Btu/lb		-6828.45	-1137.48	-1808.84	-1711.88
Mass Cp	Btu/(lb*°F)		0.983124	0.409508	0.497676 ?	0.490605
Ideal Gas CpCv Ratio			1.32584	1.15887	1.14638	1.13238
Dynamic Viscosity	cP		0.995938	0.00887943		
Kinematic Viscosity	cSt		0.998362	4.34348		
Thermal Conductivity	Btu/(h*ft*°F)		0.347101	0.011278		
Surface Tension	lbf/ft		0.00504277			
Net Ideal Gas Heating Value	Btu/ft^3		0	1887.65	1792.14	1792.14
Net Liquid Heating Value	Btu/lb		-1059.76	19917.4	16766.9	16766.9
Gross Ideal Gas Heating Value	Btu/ft^3		50.31	2057.71	1958.63	1958.63
Gross Liquid Heating Value	Btu/lb		0	21725.4	18350.3	18350.3

Remarks

Process Streams Report All Streams Tabulated by Total Phase					
Client Name					Job
Location					
Flowsheet	Flowsheet1				
Connections					
From Block	4	5	6	15	
	Common Closed Drain Tank	Slop Heat Loss	Slop Oil Tanks	Not Real	
To Block	4	5	6	15	
	Slop Heat Loss	Slop Oil Tanks	DVDR-1	Common Heat Loss	
Stream Composition					
Mole Fraction	4 %	5 %	6 %	15 %	
Nitrogen	9.79816E-08	9.79816E-08		0.000511927	
Carbon Dioxide	0.000358164	0.000358164		0.173031	
Methane	0.00133944	0.00133944		2.22256	
Ethane	0.0860512	0.0860512		28.1305	
Propane	0.144428	0.144428		15.3288	
Isobutane	0.0496943	0.0496943		2.2593	
Butane	0.219352	0.219352		7.21603	
Isopentane	0.142856	0.142856		2.05558	
Pentane	0.252581	0.252581		2.82661	
2,2-Dimethylbutane	0.0175415	0.0175415		0.128311	
2,3-Dimethylbutane	0.00160146	0.00160146		0.00900643	
Cyclopentane	0.0283374	0.0283374		0.222739	
2-Methylpentane	0.195839	0.195839		1.02362	
3-Methylpentane	0.136048	0.136048		0.643631	
Hexane	0.476064	0.476064		1.89221	
2,2-Dimethylpentane	0.00582275	0.00582275		0.0175927	
Methylcyclopentane	0.0681985	0.0681985		0.251696	
2,4-Dimethylpentane	0.0206042	0.0206042		0.059165	
Benzene	0.00994843	0.00994843		0.0348661	
3,3-Dimethylpentane	0.00502529	0.00502529		0.0121407	
Cyclohexane	0.0864935	0.0864935		0.25556	
2-Methylhexane	0.206654	0.206654		0.427457	
2,3-Dimethylpentane	0.0435839	0.0435839		0.0930168	
3-Methylhexane	0.257429	0.257429		0.505108	
3-Ethylpentane	0.0271985	0.0271985		0.0513901	
2,2,4-Trimethylpentane	0.0294111	0.0294111		0.0509965	
Heptane	0.637955	0.637955		1.03974	
Methylcyclohexane	0.40974	0.40974		0.64079	
2,5-Dimethylhexane	0.0407377	0.0407377		0.0486748	
2,4-Dimethylhexane	0.0484455	0.0484455		0.0581809	
Ethylcyclopentane	0.000856289	0.000856289		0.00120549	
Toluene	0.0723034	0.0723034		0.0959068	
2-Methylheptane	0.378783	0.378783		0.350908	
4-Methylheptane	0.156011	0.156011		0.141762	
3-Methylheptane	0.291679	0.291679		0.257259	
cis-1,3-Dimethylcyclohexane	0.116764	0.116764		0.107039	
Octane	0.578677	0.578677		0.436452	
trans-1,2-Dimethylcyclohexane	0.0432636	0.0432636		0.03685	
trans-1,3-Dimethylcyclohexane	0.0528368	0.0528368		0.0430621	
cis-1,2-Dimethylcyclohexane	0.0780634	0.0780634		0.0566128	
Ethylcyclohexane	0.0848176	0.0848176		0.073081	
Ethylbenzene	0.0350807	0.0350807		0.0228109	
m-Xylene	0.601255	0.601255		0.356553	
o-Xylene	0.0295039	0.0295039		0.0164336	
Nonane	0.468853	0.468853		0.207307	
Cumene	0.0680053	0.0680053		0.0294116	
Cyclooctane	0.040708	0.040708		0.0198022	
Propylcyclohexane	0.0821183	0.0821183		0.0342183	
Propylbenzene	0.0295955	0.0295955		0.0118225	
Mesitylene	0.132943	0.132943		0.0488953	
tert-Butylbenzene	0.000328432	0.000328432		0.000114063	

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**Process Streams Report**  
**All Streams**  
 Tabulated by Total Phase

Client Name		Job
Location		
Flowsheet	Flowsheet1	

**Stream Composition**

Mole Fraction	4 %	5 %	6 %	15 %
1,2,4-Trimethylbenzene	0.0736263	0.0736263		0.0261301
Cyclohexane, Isobutyl-	0.190811	0.190811		0.0683328
Decane	0.10154	0.10154		0.0328957
Isobutylbenzene	0.0707128	0.0707128		0.0242849
sec-Butylbenzene	0.0686387	0.0686387		0.0224421
1,2,3-Trimethylbenzene	0.162087	0.162087		0.055094
Cyclohexane, Butyl-	0.0456758	0.0456758		0.014264
Butylbenzene	0.128971	0.128971		0.0392218
Water	92.1661	92.1661		29.691

Molar Flow	4 lbmol/h	5 lbmol/h	6 lbmol/h	15 lbmol/h
Nitrogen	6.74978E-08	6.74978E-08	0	0.00139637
Carbon Dioxide	0.000246733	0.000246733	0	0.471972
Methane	0.000922716	0.000922716	0	6.06243
Ethane	0.0592792	0.0592792	0	76.7311
Propane	0.0994938	0.0994938	0	41.812
Isobutane	0.0342336	0.0342336	0	6.16264
Butane	0.151108	0.151108	0	19.683
Isopentane	0.0984108	0.0984108	0	5.60696
Pentane	0.173999	0.173999	0	7.71008
2,2-Dimethylbutane	0.0120841	0.0120841	0	0.349992
2,3-Dimethylbutane	0.00110322	0.00110322	0	0.0245666
Cyclopentane	0.0195212	0.0195212	0	0.60756
2-Methylpentane	0.13491	0.13491	0	2.79211
3-Methylpentane	0.0937211	0.0937211	0	1.75562
Hexane	0.327953	0.327953	0	5.16133
2,2-Dimethylpentane	0.0040112	0.0040112	0	0.0479873
Methylcyclopentane	0.0469808	0.0469808	0	0.686547
2,4-Dimethylpentane	0.0141939	0.0141939	0	0.161383
Benzene	0.0068533	0.0068533	0	0.0951034
3,3-Dimethylpentane	0.00346184	0.00346184	0	0.033116
Cyclohexane	0.0595839	0.0595839	0	0.697085
2-Methylhexane	0.14236	0.14236	0	1.16596
2,3-Dimethylpentane	0.0300242	0.0300242	0	0.25372
3-Methylhexane	0.177339	0.177339	0	1.37777
3-Ethylpentane	0.0187366	0.0187366	0	0.140176
2,2,4-Trimethylpentane	0.0202608	0.0202608	0	0.139102
Heptane	0.439476	0.439476	0	2.83608
Methylcyclohexane	0.282263	0.282263	0	1.74787
2,5-Dimethylhexane	0.0280635	0.0280635	0	0.132769
2,4-Dimethylhexane	0.0333733	0.0333733	0	0.158699
Ethylcyclopentane	0.000589883	0.000589883	0	0.00328818
Toluene	0.0498086	0.0498086	0	0.261603
2-Methylheptane	0.260937	0.260937	0	0.957164
4-Methylheptane	0.107474	0.107474	0	0.386681
3-Methylheptane	0.200933	0.200933	0	0.701721
cis-1,3-Dimethylcyclohexane	0.080437	0.080437	0	0.291968
Octane	0.398641	0.398641	0	1.1905
trans-1,2-Dimethylcyclohexane	0.0298036	0.0298036	0	0.100515
trans-1,3-Dimethylcyclohexane	0.0363984	0.0363984	0	0.11746
cis-1,2-Dimethylcyclohexane	0.0537765	0.0537765	0	0.154422
Ethylcyclohexane	0.0584294	0.0584294	0	0.199342
Ethylbenzene	0.0241665	0.0241665	0	0.0622209
m-Xylene	0.414194	0.414194	0	0.972563
o-Xylene	0.0203248	0.0203248	0	0.0448255
Nonane	0.322985	0.322985	0	0.565467
Cumene	0.0468477	0.0468477	0	0.0802253
Cyclooctane	0.0280431	0.0280431	0	0.0540139

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**Process Streams Report**  
**All Streams**  
Tabulated by Total Phase

Client Name		Job
Location		
Flowsheet	Flowsheet1	

Molar Flow	4 lbmol/h	5 lbmol/h	6 lbmol/h	15 lbmol/h
Propylcyclohexane	0.0565699	0.0565699	0	0.0933364
Propylbenzene	0.0203878	0.0203878	0	0.032248
Mesitylene	0.0915823	0.0915823	0	0.133371
tert-Butylbenzene	0.000226251	0.000226251	0	0.000311126
1,2,4-Trimethylbenzene	0.0507199	0.0507199	0	0.0712744
Cyclohexane, Isobutyl-	0.131446	0.131446	0	0.18639
Decane	0.0699493	0.0699493	0	0.0897289
Isobutylbenzene	0.0487128	0.0487128	0	0.0662414
sec-Butylbenzene	0.047284	0.047284	0	0.0612147
1,2,3-Trimethylbenzene	0.111659	0.111659	0	0.150279
Cyclohexane, Butyl-	0.0314653	0.0314653	0	0.0389075
Butylbenzene	0.0888459	0.0888459	0	0.106985
Water	63.4917	63.4917	0	80.9875

Mass Fraction	4 %	5 %	6 %	15 %
Nitrogen	1.11127E-07	1.11127E-07		0.000359593
Carbon Dioxide	0.000638173	0.000638173		0.190944
Methane	0.00086997	0.00086997		0.894051
Ethane	0.104758	0.104758		21.2097
Propane	0.257844	0.257844		16.9489
Isobutane	0.116939	0.116939		3.29271
Butane	0.516173	0.516173		10.5167
Isopentane	0.417289	0.417289		3.71879
Pentane	0.737803	0.737803		5.11366
2,2-Dimethylbutane	0.0612013	0.0612013		0.277259
2,3-Dimethylbutane	0.00558739	0.00558739		0.0194614
Cyclopentane	0.0804624	0.0804624		0.391701
2-Methylpentane	0.683271	0.683271		2.21187
3-Methylpentane	0.474663	0.474663		1.39078
Hexane	1.66096	1.66096		4.08874
2,2-Dimethylpentane	0.0236219	0.0236219		0.0442025
Methylcyclopentane	0.232374	0.232374		0.53115
2,4-Dimethylpentane	0.0835878	0.0835878		0.148655
Benzene	0.0314617	0.0314617		0.0682901
3,3-Dimethylpentane	0.0203868	0.0203868		0.0305041
Cyclohexane	0.294711	0.294711		0.539304
2-Methylhexane	0.83836	0.83836		1.074
2,3-Dimethylpentane	0.176813	0.176813		0.233709
3-Methylhexane	1.04435	1.04435		1.26911
3-Ethylpentane	0.11034	0.11034		0.12912
2,2,4-Trimethylpentane	0.136018	0.136018		0.146067
Heptane	2.58807	2.58807		2.61239
Methylcyclohexane	1.6288	1.6288		1.57762
2,5-Dimethylhexane	0.1884	0.1884		0.139417
2,4-Dimethylhexane	0.224047	0.224047		0.166645
Ethylcyclopentane	0.00340393	0.00340393		0.0029679
Toluene	0.269718	0.269718		0.221579
2-Methylheptane	1.75176	1.75176		1.00509
4-Methylheptane	0.721509	0.721509		0.406043
3-Methylheptane	1.34893	1.34893		0.736857
cis-1,3-Dimethylcyclohexane	0.530473	0.530473		0.301177
Octane	2.67622	2.67622		1.25011
trans-1,2-Dimethylcyclohexane	0.196551	0.196551		0.103685
trans-1,3-Dimethylcyclohexane	0.240043	0.240043		0.121164
cis-1,2-Dimethylcyclohexane	0.35465	0.35465		0.159292
Ethylcyclohexane	0.385335	0.385335		0.205629
Ethylbenzene	0.150786	0.150786		0.0607242
m-Xylene	2.58435	2.58435		0.949169
o-Xylene	0.126815	0.126815		0.0437473
Nonane	2.43457	2.43457		0.666693

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Process Streams Report					
All Streams					
Tabulated by Total Phase					
Client Name					Job
Location					
Flowsheet	Flowsheet1				
Mass Fraction	4 %	5 %	6 %	15 %	
Cumene	0.330924	0.330924		0.08864	
Cyclooctane	0.184941	0.184941		0.0557175	
Propylcyclohexane	0.419706	0.419706		0.108315	
Propylbenzene	0.144016	0.144016		0.0356304	
Mesitylene	0.646921	0.646921		0.14736	
tert-Butylbenzene	0.00178471	0.00178471		0.000383877	
1,2,4-Trimethylbenzene	0.358276	0.358276		0.0787503	
Cyclohexane, Isobutyl-	1.08359	1.08359		0.240336	
Decane	0.584921	0.584921		0.117362	
Isobutylbenzene	0.384255	0.384255		0.0817307	
sec-Butylbenzene	0.372984	0.372984		0.0755286	
1,2,3-Trimethylbenzene	0.788739	0.788739		0.166041	
Cyclohexane, Butyl-	0.259387	0.259387		0.0501683	
Butylbenzene	0.700832	0.700832		0.132001	
Water	67.2238	67.2238		13.4123	
Mass Flow	4 lb/h	5 lb/h	6 lb/h	15 lb/h	
Nitrogen	1.89084E-06	1.89084E-06	0	0.0391171	
Carbon Dioxide	0.0108586	0.0108586	0	20.7712	
Methane	0.0148026	0.0148026	0	97.2563	
Ethane	1.78247	1.78247	0	2307.23	
Propane	4.38724	4.38724	0	1843.72	
Isobutane	1.98973	1.98973	0	358.186	
Butane	8.78273	8.78273	0	1144.02	
Isopentane	7.10022	7.10022	0	404.536	
Pentane	12.5538	12.5538	0	556.273	
2,2-Dimethylbutane	1.04135	1.04135	0	30.1606	
2,3-Dimethylbutane	0.0950701	0.0950701	0	2.11704	
Cyclopentane	1.36908	1.36908	0	42.6099	
2-Methylpentane	11.6259	11.6259	0	240.611	
3-Methylpentane	8.07645	8.07645	0	151.291	
Hexane	28.2614	28.2614	0	444.779	
2,2-Dimethylpentane	0.40193	0.40193	0	4.80842	
Methylcyclopentane	3.95388	3.95388	0	57.7794	
2,4-Dimethylpentane	1.42226	1.42226	0	16.1709	
Benzene	0.535324	0.535324	0	7.4287	
3,3-Dimethylpentane	0.346883	0.346883	0	3.31829	
Cyclohexane	5.01455	5.01455	0	58.6663	
2-Methylhexane	14.2648	14.2648	0	116.832	
2,3-Dimethylpentane	3.00848	3.00848	0	25.4232	
3-Methylhexane	17.7697	17.7697	0	138.056	
3-Ethylpentane	1.87744	1.87744	0	14.0459	
2,2,4-Trimethylpentane	2.31436	2.31436	0	15.8894	
Heptane	44.0364	44.0364	0	284.18	
Methylcyclohexane	27.7143	27.7143	0	171.616	
2,5-Dimethylhexane	3.20565	3.20565	0	15.166	
2,4-Dimethylhexane	3.81218	3.81218	0	18.1279	
Ethylcyclopentane	0.0579183	0.0579183	0	0.322853	
Toluene	4.58928	4.58928	0	24.1037	
2-Methylheptane	29.8065	29.8065	0	109.335	
4-Methylheptane	12.2766	12.2766	0	44.17	
3-Methylheptane	22.9523	22.9523	0	80.1565	
cis-1,3-Dimethylcyclohexane	9.02605	9.02605	0	32.7625	
Octane	45.5362	45.5362	0	135.989	
trans-1,2-Dimethylcyclohexane	3.34434	3.34434	0	11.279	
trans-1,3-Dimethylcyclohexane	4.08436	4.08436	0	13.1805	
cis-1,2-Dimethylcyclohexane	6.03441	6.03441	0	17.3281	
Ethylcyclohexane	6.55651	6.55651	0	22.3686	
Ethylbenzene	2.56564	2.56564	0	6.60568	
m-Xylene	43.9729	43.9729	0	103.252	

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**Process Streams Report**  
**All Streams**  
Tabulated by Total Phase

Client Name		Job
Location		
Flowsheet	Flowsheet1	

Mass Flow	4 lb/h	5 lb/h	6 lb/h	15 lb/h
c-Xylene	2.15778	2.15778	0	4.7589
Nonane	41.4245	41.4245	0	72.524
Cumene	5.6307	5.6307	0	9.64241
Cyclooctane	3.14679	3.14679	0	6.06104
Propylcyclohexane	7.14134	7.14134	0	11.7827
Propylbenzene	2.45044	2.45044	0	3.87593
Mesitylene	11.0074	11.0074	0	16.03
tert-Butylbenzene	0.0303671	0.0303671	0	0.0417588
1,2,4-Trimethylbenzene	6.0961	6.0961	0	8.56659
Cyclohexane, Isobutyl-	18.4374	18.4374	0	26.1441
Decane	9.9525	9.9525	0	12.7668
Isobutylbenzene	6.53815	6.53815	0	8.8908
sec-Butylbenzene	6.34637	6.34637	0	8.21613
1,2,3-Trimethylbenzene	13.4205	13.4205	0	18.0622
Cyclohexane, Butyl-	4.4135	4.4135	0	5.45739
Butylbenzene	11.9247	11.9247	0	14.3593
Water	1143.82	1143.82	0	1459.01

**Stream Properties**

Property	Units	4	5	6	15
Temperature	°F	120	70 *	70	70 *
Pressure	psia	19.7	14.7 *	14.7	19.7 *
Mole Fraction Vapor	%	0	0		62.0518
Mole Fraction Light Liquid	%	7.84505	7.83579		9.40212
Mole Fraction Heavy Liquid	%	92.1549	92.1642		28.5461
Molecular Weight	lb/lbmol	24.6996	24.6996		39.8807
Mass Density	lb/ft <sup>3</sup>	54.6711	55.7372		0.227218
Molar Flow	lbmol/h	68.8883	68.8883	0	272.768
Mass Flow	lb/h	1701.51	1701.51	0	10878.2
Vapor Volumetric Flow	ft <sup>3</sup> /h	31.1227	30.5274		47875.3
Liquid Volumetric Flow	gpm	3.88023	3.80601		5968.87
Std Vapor Volumetric Flow	MMSCFD	0.627409	0.627409	0	2.48427
Std Liquid Volumetric Flow	sgpm	3.80521	3.80521	0	39.6149
Compressibility		0.00143071	0.00114602		0.608297
Specific Gravity		0.876575	0.893669		
API Gravity		26.594	26.3497		
Enthalpy	Btu/h	-8.1705E+06	-8.24038E+06 ?	0	-1.94253E+07 ?
Mass Enthalpy	Btu/lb	-4801.9	-4842.98 ?		-1785.72 ?
Mass Cp	Btu/(lb*°F)	0.825398	0.815446 ?		0.497671 ?
Ideal Gas Cp/Cv Ratio		1.2297	1.23747		1.14209
Dynamic Viscosity	cP	0.487388	0.795975		
Kinematic Viscosity	cSt	0.55164	0.868562		
Thermal Conductivity	Btu/(h*ft*°F)	0.245545	0.236661		
Surface Tension	lbf/ft	0.00330833	0.00363083 ?		
Net Ideal Gas Heating Value	Btu/ft <sup>3</sup>	403.362	403.362		1792.14
Net Liquid Heating Value	Btu/lb	5425.06	5425.06		16766.9
Gross Ideal Gas Heating Value	Btu/ft <sup>3</sup>	479.004	479.004		1958.63
Gross Liquid Heating Value	Btu/lb	6586.6	6586.6		18350.3

Remarks

## Energy Stream Report

Client Name		Job
Location		
Flowsheet	Flowsheet1	

### Energy Streams

Energy Stream	Energy Rate	Power	From Block	To Block
Q-1	803174 Btu/h	315.659 hp	--	Common Heat Loss
Q-2	0 Btu/h	0 hp	--	DVDR-1
Q-4	69882.3 Btu/h	27.4648 hp	Slop Heat Loss	--
Q-5	251534 Btu/h	98.8565 hp	--	Not Real

Remarks

<b>Blocks</b>					
<b>Common Closed Drain Tank</b>					
Separator Report					
Client Name					Job
Location					Modified 6:17 PM, 11/10/2014
Flowsheet	Flowsheet1				Status: Solved 2:27 PM, 4/13/2015
<b>Connections</b>					
Stream	Connection Type	Other Block	Stream	Connection Type	Other Block
2	Inlet	Common Heat Loss	To Flare	Vapor Outlet	
4	Light Liquid Outlet	Slop Heat Loss			
<b>Block Parameters</b>					
* Pressure Drop	0 psi		Main Liquid Phase	Light Liquid	
Mole Fraction Vapor	74.7447 %		Heat Duty	0 Btu/h	
Mole Fraction Light Liquid	1.98129 %		Heat Release Curve Type	Plug Flow	
Mole Fraction Heavy Liquid	23.274 %		Heat Release Curve Increments	5	
<b>Remarks</b>					

<b>Blocks</b> <b>Common Heat Loss</b> Heat Exchanger Report		
Client Name		Job
Location		Modified 1 41 PM, 11/24/2014
Flowsheet	Flowsheet1	Status Solved 2 27 PM, 4/13/2015
<b>Connections</b>		
<b>Stream</b>	<b>Connection Type</b>	<b>Other Block</b>
15	Inlet	Not Real
Q-1	Energy	
2	Outlet	Common Closed Drain Tank
<b>Block Parameters</b>		
* Pressure Drop	0 psi	Heat Release Curve Type
Temperature Change	50 °F	Plug Flow
Heat Duty	803174 Btu/h	Heat Release Curve Increments
5		
<b>Remarks</b>		

\* User Specified Values  
 ? Extrapolated or Approximate Values

Blocks	
DVDR-1	
Divider Report	

Client Name		Job
Location		Modified 1 20 PM, 12/1/2014
Flowsheet	Flowsheet1	Status Solved 2 27 PM, 4/13/2015

Connections					
Stream	Connection Type	Other Block	Stream	Connection Type	Other Block
6 VOCs	Inlet Divider Extracted Stream	Slop Oil Tanks	Non-VOCs Q-2	Divider Bulk Stream Energy	

Block Parameters			
Bulk Stream Pressure Drop	0 psi	Extracted Stream Pressure Drop	0 psi
Bulk Stream Temperature Change	0 °F	Extracted Stream Temperature Change	0 °F

Tabulated Block Data				
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Index	Component Fraction Extracted %			
Nitrogen	0 *			
Carbon Dioxide	0 *			
Methane	0 *			
Ethane	0 *			
Propane	100 *			
Isobutane	100 *			
Butane	100 *			
Isopentane	100 *			
Pentane	100 *			
2,2-Dimethylbutane	100 *			
2,3-Dimethylbutane	0 *			
Cyclopentane	100 *			
2-Methylpentane	100 *			
3-Methylpentane	100 *			
Hexane	100 *			
2,2-Dimethylpentane	100 *			
Methylcyclopentane	100 *			
2,4-Dimethylpentane	100 *			
Benzene	100 *			
3,3-Dimethylpentane	100 *			
Cyclohexane	100 *			
2-Methylhexane	100 *			
2,3-Dimethylpentane	100 *			
3-Methylhexane	100 *			
3-Ethylpentane	100 *			
2,2,4-Trimethylpentane	100 *			
Heptane	100 *			
Methylcyclohexane	100 *			
2,5-Dimethylhexane	100 *			
2,4-Dimethylhexane	100 *			
Ethylcyclopentane	0 *			
Toluene	100 *			
2-Methylheptane	100 *			
4-Methylheptane	100 *			
3-Methylheptane	100 *			
cis-1,3-Dimethylcyclohexane	100 *			
Octane	100 *			
trans-1,2-Dimethylcyclohexane	100 *			
trans-1,3-Dimethylcyclohexane	100 *			
cis-1,2-Dimethylcyclohexane	100 *			
Ethylcyclohexane	100 *			
Ethylbenzene	100 *			
m-Xylene	100 *			
o-Xylene	100 *			

Client Name		Job	
Location		Modified 1 20 PM, 12/1/2014	
Flowsheet		Status Solved 2 27 PM, 4/13/2015	
<b>Blocks DVDR-1 Divider Report</b>			
Tabulated Block Data			
Index	Component Fraction Extracted %		
Nonane	100 *		
Cumene	100 *		
Cyclooctane	100 *		
Propylcyclohexane	100 *		
Propylbenzene	100 *		
Mesitylene	100 *		
tert-Butylbenzene	0 *		
1,2,4-Trimethylbenzene	100 *		
Cyclohexane, Isobutyl-	100 *		
Decane	100 *		
Isobutylbenzene	100 *		
sec-Butylbenzene	100 *		
1,2,3-Trimethylbenzene	100 *		
Cyclohexane, Butyl-	100 *		
Butylbenzene	100 *		
Water	0 *		
Remarks			

<b>Blocks</b>		
<b>MIX-100</b>		
Mixer/Splitter Report		
Client Name		Job
Location		Modified 1 05 PM, 12/1/2014
Flowsheet	Flowsheet1	Status Solved 2 27 PM, 4/13/2015
<b>Connections</b>		
<b>Stream</b>	<b>Connection Type</b>	<b>Other Block</b>
Y Grade Ave	Inlet	
Water	Inlet	
1	Outlet	Not Real
<b>Stream</b>	<b>Connection Type</b>	<b>Other Block</b>
Condensate Ave	Inlet	
Pigged Liquids	Inlet	
<b>Block Parameters</b>		
Pressure Drop	0 psi	Fraction to PStream 1
		100 %
<b>Remarks</b>		

\* User Specified Values  
 ? Extrapolated or Approximate Values

<b>Blocks Not Real</b>					
Heat Exchanger Report					
Client Name				Job	
Location				Modified 1 34 PM, 11/24/2014	
Flowsheet		Flowsheet I		Status Solved 2 27 PM, 4/13/2015	
Connections					
Stream	Connection Type	Other Block	Stream	Connection Type	Other Block
1	Inlet	MIX-100	15	Outlet	Common Heat Loss
Q-5	Energy				
Block Parameters					
Pressure Drop		0.3 psi		Heat Release Curve Type Plug Flow	
Temperature Change		20.2471 °F		Heat Release Curve Increments 5	
Heat Duty		251534 Btu/h			
<b>Remarks</b>					

<b>Blocks</b>					
<b>Slop Heat Loss</b>					
Heat Exchanger Report					
Client Name					Job
Location					Modified 7 25 PM, 11/10/2014
Flowsheet	Flowsheet1				Status Solved 2 27 PM, 4/13/2015
<b>Connections</b>					
Stream	Connection Type	Other Block	Stream	Connection Type	Other Block
4	Inlet	Common Closed Drain Tank	5	Outlet	Slop Oil Tanks
Q-4	Energy				
<b>Block Parameters</b>					
Pressure Drop	5 psi		Heat Release Curve Type	Plug Flow	
Temperature Change	-50 °F		Heat Release Curve Increments	4	
Heat Duty	-69882.3 Btu/h				
<b>Remarks</b>					

<b>Blocks</b>					
<b>Slop Oil Tanks</b>					
Separator Report					
Client Name					Job
Location					Modified 6:18 PM, 11/10/2014
Flowsheet	Flowsheet1				Status Solved 2:27 PM, 4/13/2015
Connections					
Stream	Connection Type	Other Block	Stream	Connection Type	Other Block
5	Inlet	Slop Heat Loss	6	Vapor Outlet	DVDR-1
Trucked Liquid	Light Liquid Outlet				
Block Parameters					
* Pressure Drop	0	psi	Main Liquid Phase	Light Liquid	
Mole Fraction Vapor	0	%	Heat Duty	0	Btu/h
Mole Fraction Light Liquid	7.83579	%	Heat Release Curve Type	Plug Flow	
Mole Fraction Heavy Liquid	92.1642	%	Heat Release Curve Increments	5	
<b>Remarks</b>					

Flowsheet Environment Environment1					
Client Name					Job
Location					
Flowsheet	Flowsheet1				
Environment Settings					
Number of Poynting Intervals	0	Freeze Out Temperature Threshold Difference	10 °F		
Gibbs Excess Model Evaluation Temperature	77 °F	Phase Tolerance	1 %		
Components					
Component Name	Henry's Law Component	Phase Initiator	Component Name	Henry's Law Component	Phase Initiator
Nitrogen	False	False	Ethylcyclopentane	False	False
Carbon Dioxide	False	False	Toluene	False	False
Methane	False	False	2-Methylheptane	False	False
Ethane	False	False	4-Methylheptane	False	False
Propane	False	False	3-Methylheptane	False	False
Isobutane	False	False	cis-1,3-Dimethylcyclohexane	False	False
Butane	False	False	Octane	False	False
Isopentane	False	False	trans-1,2-Dimethylcyclohexane	False	False
Pentane	False	False	trans-1,3-Dimethylcyclohexane	False	False
2,2-Dimethylbutane	False	False	cis-1,2-Dimethylcyclohexane	False	False
2,3-Dimethylbutane	False	False	Ethylcyclohexane	False	False
Cyclopentane	False	False	Ethylbenzene	False	False
2-Methylpentane	False	False	m-Xylene	False	False
3-Methylpentane	False	False	o-Xylene	False	False
Hexane	False	False	Nonane	False	False
2,2-Dimethylpentane	False	False	Cumene	False	False
Methylcyclopentane	False	False	Cyclooctane	False	False
2,4-Dimethylpentane	False	False	Propylcyclohexane	False	False
Benzene	False	False	Propylbenzene	False	False
3,3-Dimethylpentane	False	False	Mesitylene	False	False
Cyclohexane	False	False	tert-Butylbenzene	False	False
2-Methylhexane	False	False	1,2,4-Trimethylbenzene	False	False
2,3-Dimethylpentane	False	False	Cyclohexane, Isobutyl-	False	False
3-Methylhexane	False	False	Decane	False	False
3-Ethylpentane	False	False	Isobutylbenzene	False	False
2,2,4-Trimethylpentane	False	False	sec-Butylbenzene	False	False
Heptane	False	False	1,2,3-Trimethylbenzene	False	False
Methylcyclohexane	False	False	Cyclohexane, Butyl-	False	False
2,5-Dimethylhexane	False	False	Butylbenzene	False	False
2,4-Dimethylhexane	False	False	Water	False	True
Physical Property Method Sets					
Liquid Molar Volume	COSTALD		Overall Package	Peng-Robinson	
Stability Calculation	Peng-Robinson		Vapor Package	Peng-Robinson	
Light Liquid Package	Peng-Robinson		Heavy Liquid Package	Peng-Robinson	
Remarks					

## Environments Report

Client Name:		Job:	
Location:			

### Project-Wide Constants

Atmospheric Pressure	14.6959 psia	IG Ref Pressure	14.6959 psia
IG Ref Temperature	60 °F	IG Ref Volume	379.485 ft <sup>3</sup> /lbmol
Liq Ref Temperature	60 °F		

### Environment [Environment1]

#### Environment Settings

Number of Poynting Intervals	0	Freeze Out Temperature Threshold Difference	10 °F
Gibbs Excess Model Evaluation Temperature	77 °F	Phase Tolerance	1 %

### Components

Component Name	Henry's Law Component	Phase Initiator	Component Name	Henry's Law Component	Phase Initiator
Nitrogen	False	False	Ethylcyclopentane	False	False
Carbon Dioxide	False	False	Toluene	False	False
Methane	False	False	2-Methylheptane	False	False
Ethane	False	False	4-Methylheptane	False	False
Propane	False	False	3-Methylheptane	False	False
Isobutane	False	False	cis-1,3-Dimethylcyclohexane	False	False
Butane	False	False	Octane	False	False
Isopentane	False	False	trans-1,2-Dimethylcyclohexane	False	False
Pentane	False	False	trans-1,3-Dimethylcyclohexane	False	False
2,2-Dimethylbutane	False	False	cis-1,2-Dimethylcyclohexane	False	False
2,3-Dimethylbutane	False	False	Ethylcyclohexane	False	False
Cyclopentane	False	False	Ethylbenzene	False	False
2-Methylpentane	False	False	m-Xylene	False	False
3-Methylpentane	False	False	o-Xylene	False	False
Hexane	False	False	Nonane	False	False
2,2-Dimethylpentane	False	False	Cumene	False	False
Methylcyclopentane	False	False	Cyclooctane	False	False
2,4-Dimethylpentane	False	False	Propylcyclohexane	False	False
Benzene	False	False	Propylbenzene	False	False
3,3-Dimethylpentane	False	False	Mesitylene	False	False
Cyclohexane	False	False	tert-Butylbenzene	False	False
2-Methylhexane	False	False	1,2,4-Trimethylbenzene	False	False
2,3-Dimethylpentane	False	False	Cyclohexane, isobutyl-	False	False
3-Methylhexane	False	False	Decane	False	False
3-Ethylpentane	False	False	Isobutylbenzene	False	False
2,2,4-Trimethylpentane	False	False	sec-Butylbenzene	False	False
Heptane	False	False	1,2,3-Trimethylbenzene	False	False
Methylcyclohexane	False	False	Cyclohexane, Butyl-	False	False
2,5-Dimethylhexane	False	False	Butylbenzene	False	False
2,4-Dimethylhexane	False	False	Water	False	True

### Physical Property Method Sets

Liquid Molar Volume	COSTALD	Overall Package	Peng-Robinson
Stability Calculation	Peng-Robinson	Vapor Package	Peng-Robinson
Light Liquid Package	Peng-Robinson	Heavy Liquid Package	Peng-Robinson

Remarks

### Calculator Report

Client Name:		Job
Location		

#### Simple Solver 1

##### Source Code

Residual Error (for CV1) = MV1/130.463-1

##### Calculated Variable [CV1]

SourceMoniker	ProMax:ProMax!Project!Flowsheets!Flowsheet1!PStreams!Y Grade Ave!Phases!Total!Properties!Std Liquid Volumetric Flow
Value	18.2033
Unit	sgpm

##### Measured Variable [MV1]

SourceMoniker	ProMax:ProMax!Project!Flowsheets!Flowsheet1!PStreams!Trucked Liquid!Phases!Total!Properties!Std Liquid Volumetric Flow
Value	130.464
Unit	bbl/d

##### Solver Properties

Status: Solved

Error	9.1487E-06	Iterations	1
Calculated Value	18.2033 sgpm	Max Iterations	20
Lower Bound	sgpm	Weighting	1
Upper Bound	sgpm	Priority	0
Step Size	sgpm	Solver Active	Active
Is Minimizer	False	Group	
Algorithm	Default	Skip Dependency Check	False

Remarks

#### Simple Specifier 1

##### Source Code

CV1 = YGflow

##### Calculated Variable [CV1]

SourceMoniker	ProMax:ProMax!Project!Flowsheets!Flowsheet1!PStreams!Condensate Ave!Phases!Total!Properties!Std Liquid Volumetric Flow
Value	18.2033
Unit	sgpm

##### Measured Variable [YGflow]

SourceMoniker	ProMax:ProMax!Project!Flowsheets!Flowsheet1!PStreams!Y Grade Ave!Phases!Total!Properties!Std Liquid Volumetric Flow
Value	18.2033
Unit	sgpm

Remarks

#### Simple Specifier 2

##### Source Code

CV1 = 0.1\*Water

##### Calculated Variable [CV1]

SourceMoniker	ProMax:ProMax!Project!Flowsheets!Flowsheet1!PStreams!Pigged Liquids!Phases!Total!Properties!Std Liquid Volumetric Flow
Value	10
Unit	bbl/d

\* User Specified Values  
 ? Extrapolated or Approximate Values

<b>Calculator Report</b>	
<b>Client Name</b>	<b>Job</b>
<b>Location</b>	
<b>Measured Variable [Water]</b>	
<b>SourceMoniker</b>	ProMax:ProMax!Project!Flowsheets!Flowsheet1!PStreams!Water!Phases!Total!Properties!Std Liquid Volumetric Flow
<b>Value</b>	100
<b>Unit</b>	bb/d
<b>Remarks</b>	

## Recoveries Report

Client Name		Job
Location		

### Component Recoveries - Project Inlets

Status Solved

### Recovery Stream Data Source - All Inlets in Project

Flowsheet	PStream	Flowsheet	PStream
Flowsheet1	Condensate Ave	Flowsheet1	Water
Flowsheet1	Pigged Liquids	Flowsheet1	Y Grade Ave

### Parameters

* Composition Basis	Molar Flow	* Atomic Basis	False
* Calculate Ratios	False	* Summation Only	False

### Tabulated Data

Index	Flowsheet1:Condensate Ave Ibmol/h	Flowsheet1:Pigged Liquids Ibmol/h	Flowsheet1:Water Ibmol/h	Flowsheet1:Y Grade Ave Ibmol/h
Nitrogen	0	0.00139634	0	3.17357E-08
Carbon Dioxide	0.0286105	0.00154272	0	0.441819
Methane	2.371	0.427457	0	3.26397
Ethane	7.40706	0.355458	0	68.9686
Propane	17.1139	0.306865	0	24.3912
Isobutane	3.98306	0.0543118	0	2.12527
Butane	14.4361	0.176091	0	5.07081
Isopentane	4.80009	0.0548019	0	0.752074
Pentane	6.7603	0.0808677	0	0.868912
2,2-Dimethylbutane	0.3345	0.0020792	0	0.0134125
2,3-Dimethylbutane	0	0.00428474	0	0.0202819
Cyclopentane	0.60756	0	0	0
2-Methylpentane	2.66831	0.0236489	0	0.100148
3-Methylpentane	1.68414	0.014965	0	0.0565094
Hexane	4.99805	0.0409023	0	0.122374
2,2-Dimethylpentane	0.0460398	0.000587127	0	0.00136038
Methylcyclopentane	0.669548	0.00430988	0	0.0126885
2,4-Dimethylpentane	0.161383	0	0	0
Benzene	0.0930937	0.000453643	0	0.00155607
3,3-Dimethylpentane	0.033116	0	0	0
Cyclohexane	0.683296	0.00388198	0	0.00990726
2-Methylhexane	1.14298	0.00992302	0	0.0130619
2,3-Dimethylpentane	0.247726	0.00244886	0	0.00354524
3-Methylhexane	1.3446	0.0147349	0	0.0184388
3-Ethylpentane	0.137779	0.00107791	0	0.00131842
2,2,4-Trimethylpentane	0.136327	0.00127888	0	0.0014964
Heptane	2.79056	0.0224092	0	0.0231065
Methylcyclohexane	1.72512	0.0114858	0	0.0112645
2,5-Dimethylhexane	0.13114	0.000987601	0	0.000641285
2,4-Dimethylhexane	0.158699	0	0	0
Ethylcyclopentane	0	0.00184479	0	0.00144339
Toluene	0.257888	0.00199637	0	0.00171805
2-Methylheptane	0.947742	0.00674225	0	0.00267881
4-Methylheptane	0.382995	0.00261839	0	0.00106796
3-Methylheptane	0.694993	0.00483101	0	0.0018965
cis-1,3-Dimethylcyclohexane	0.288296	0.00265603	0	0.00101652
Octane	1.17833	0.00933063	0	0.00284154
trans-1,2-Dimethylcyclohexane	0.0995525	0.00071744	0	0.000245029
trans-1,3-Dimethylcyclohexane	0.117135	0.000248263	0	7.62135E-05
cis-1,2-Dimethylcyclohexane	0.154422	0	0	0
Ethylcyclohexane	0.197309	0.00147666	0	0.000555703
Ethylbenzene	0.0619157	0.000243817	0	6.13073E-05
m-Xylene	0.97029	0.00188445	0	0.000388245
o-Xylene	0.0444931	0.000281325	0	5.11343E-05
Nonane	0.562571	0.00269539	0	0.000199984
Cumene	0.0799818	0.000224361	0	1.91701E-05

\* User Specified Values

? Extrapolated or Approximate Values

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## Recoveries Report

Client Name		Job
Location		

### Tabulated Data

Index	Flowsheet1: Condensate Ave lbmol/h	Flowsheet1: Pigged Liquids lbmol/h	Flowsheet1: Water lbmol/h	Flowsheet1: Y Grade Ave lbmol/h
Cyclooctane	0.0535863	0.000384961	0	4.26257E-05
Propylcyclohexane	0.0927733	0.00052003	0	4.31192E-05
Propylbenzene	0.032248	0	0	0
Mesitylene	0.132819	0.000520137	0	3.11663E-05
tert-Butylbenzene	0	0.000300368	0	1.07581E-05
1,2,4-Trimethylbenzene	0.0712744	0	0	0
Cyclohexane, Isobutyl-	0.18639	0	0	0
Decane	0.0887915	0.000910135	0	2.72204E-05
Isobutylbenzene	0.0662414	0	0	0
sec-Butylbenzene	0.0612147	0	0	0
1,2,3-Trimethylbenzene	0.150279	0	0	0
Cyclohexane, Butyl-	0.0389075	0	0	0
Butylbenzene	0.106985	0	0	0
Water	0	0.000162461	80.9874	0

Index	Summary Table lbmol/h			
Nitrogen	0.00139637			
Carbon Dioxide	0.471972			
Methane	6.06243			
Ethane	76.7311			
Propane	41.812			
Isobutane	6.16264			
Butane	19.683			
Isopentane	5.60696			
Pentane	7.71008			
2,2-Dimethylbutane	0.349992			
2,3-Dimethylbutane	0.0245666			
Cyclopentane	0.60756			
2-Methylpentane	2.79211			
3-Methylpentane	1.75562			
Hexane	5.16133			
2,2-Dimethylpentane	0.0479873			
Methylcyclopentane	0.686547			
2,4-Dimethylpentane	0.161383			
Benzene	0.0951034			
3,3-Dimethylpentane	0.033116			
Cyclohexane	0.697085			
2-Methylhexane	1.16596			
2,3-Dimethylpentane	0.25372			
3-Methylhexane	1.37777			
3-Ethylpentane	0.140176			
2,2,4-Trimethylpentane	0.139102			
Heptane	2.83608			
Methylcyclohexane	1.74787			
2,5-Dimethylhexane	0.132769			
2,4-Dimethylhexane	0.158699			
Ethylcyclopentane	0.00328818			
Toluene	0.261603			
2-Methylheptane	0.957164			
4-Methylheptane	0.386681			
3-Methylheptane	0.701721			
cis-1,3-Dimethylcyclohexane	0.291968			
Octane	1.1905			
trans-1,2-Dimethylcyclohexane	0.100515			
trans-1,3-Dimethylcyclohexane	0.11746			

\* User Specified Values  
 ? Extrapolated or Approximate Values

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## Recoveries Report

Client Name	Job
Location	

Index	Summary Table lbmol/h			
cis-1,2-Dimethylcyclohexane	0.154422			
Ethylcyclohexane	0.199342			
Ethylbenzene	0.0622209			
m-Xylene	0.972563			
o-Xylene	0.0448255			
Nonane	0.565467			
Cumene	0.0802253			
Cyclooctane	0.0540139			
Propylcyclohexane	0.0933364			
Propylbenzene	0.032248			
Mesitylene	0.133371			
tert-Butylbenzene	0.000311126			
1,2,4-Trimethylbenzene	0.0712744			
Cyclohexane, Isobutyl-	0.18639			
Decane	0.0897289			
Isobutylbenzene	0.0662414			
sec-Butylbenzene	0.0612147			
1,2,3-Trimethylbenzene	0.150279			
Cyclohexane, Butyl-	0.0389075			
Butylbenzene	0.106985			
Water	80.9875			

**Remarks**

**Component Recoveries - Project Outlets** Status Solved

**Recovery Stream Data Source - All Outlets in Project**

Flowsheet	PStream	Flowsheet	PStream
Flowsheet1	Non-VOCs	Flowsheet1	Trucked Liquid
Flowsheet1	To Flare	Flowsheet1	VOCs

**Parameters**

* Composition Basis	Molar Flow	* Atomic Basis	False
* Calculate Ratios	False	* Summation Only	False

**Tabulated Data**

Index	Flowsheet1:Non-VOCs lbmol/h	Flowsheet1:To Flare lbmol/h	Flowsheet1:Trucked Liquid lbmol/h	Flowsheet1:VOCs lbmol/h
Nitrogen	0	0.0013963	6.74978E-08	0
Carbon Dioxide	0	0.471725	0.000246733	0
Methane	0	6.06151	0.000922716	0
Ethane	0	76.6718	0.0592792	0
Propane	0	41.7125	0.0994938	0
Isobutane	0	6.12841	0.0342336	0
Butane	0	19.5319	0.151108	0
Isopentane	0	5.50855	0.0984108	0
Pentane	0	7.53608	0.173999	0
2,2-Dimethylbutane	0	0.337907	0.0120841	0
2,3-Dimethylbutane	0	0.0234634	0.00110322	0
Cyclopentane	0	0.588038	0.0195212	0
2-Methylpentane	0	2.6572	0.13491	0
3-Methylpentane	0	1.6619	0.0937211	0
Hexane	0	4.83338	0.327953	0
2,2-Dimethylpentane	0	0.0439761	0.0040112	0
Methylcyclopentane	0	0.639566	0.0469808	0

\* User Specified Values  
? Extrapolated or Approximate Values

## Recoveries Report

Client Name	Job
Location	

### Tabulated Data

Index	Flowsheet1 Non-VOCs lbmol/h	Flowsheet1.To Flare lbmol/h	Flowsheet1.Trucked Liquid lbmol/h	Flowsheet1 VOCs lbmol/h
2,4-Dimethylpentane	0	0.147189	0.0141939	0
Benzene	0	0.0882501	0.0068533	0
3,3-Dimethylpentane	0	0.0296542	0.00346184	0
Cyclohexane	0	0.637501	0.0595839	0
2-Methylhexane	0	1.0236	0.14236	0
2,3-Dimethylpentane	0	0.223696	0.0300242	0
3-Methylhexane	0	1.20044	0.177339	0
3-Ethylpentane	0	0.121439	0.0187366	0
2,2,4-Trimethylpentane	0	0.118841	0.0202608	0
Heptane	0	2.3966	0.439476	0
Methylcyclohexane	0	1.46561	0.282263	0
2,5-Dimethylhexane	0	0.104706	0.0280635	0
2,4-Dimethylhexane	0	0.125326	0.0333733	0
Ethylcyclopentane	0	0.00269829	0.000589883	0
Toluene	0	0.211794	0.0498086	0
2-Methylheptane	0	0.696226	0.260937	0
4-Methylheptane	0	0.279207	0.107474	0
3-Methylheptane	0	0.500788	0.200933	0
cis-1,3-Dimethylcyclohexane	0	0.211531	0.0804371	0
Octane	0	0.791861	0.398641	0
trans-1,2-Dimethylcyclohexane	0	0.0707114	0.0298036	0
trans-1,3-Dimethylcyclohexane	0	0.0810613	0.0363984	0
cis-1,2-Dimethylcyclohexane	0	0.100645	0.0537765	0
Ethylcyclohexane	0	0.140912	0.0584294	0
Ethylbenzene	0	0.0380544	0.0241665	0
m-Xylene	0	0.558368	0.414194	0
o-Xylene	0	0.0245008	0.0203248	0
Nonane	0	0.242482	0.322985	0
Cumene	0	0.0333776	0.0468477	0
Cyclooctane	0	0.0259708	0.0280431	0
Propylcyclohexane	0	0.0367665	0.0565699	0
Propylbenzene	0	0.0118601	0.0203878	0
Mesitylene	0	0.0417883	0.0915824	0
tert-Butylbenzene	0	8.48746E-05	0.000226252	0
1,2,4-Trimethylbenzene	0	0.0205546	0.0507199	0
Cyclohexane, Isobutyl-	0	0.0549437	0.131446	0
Decane	0	0.0197796	0.0699493	0
Isobutylbenzene	0	0.0175286	0.0487128	0
sec-Butylbenzene	0	0.0139307	0.047284	0
1,2,3-Trimethylbenzene	0	0.0386197	0.111659	0
Cyclohexane, Butyl-	0	0.00744224	0.0314653	0
Butylbenzene	0	0.0181386	0.0888459	0
Water	0	17.4958	63.4917	0

Index	Summary Table lbmol/h			
Nitrogen	0.00139637			
Carbon Dioxide	0.471972			
Methane	6.06243			
Ethane	76.7311			
Propane	41.812			
Isobutane	6.16264			
Butane	19.683			
Isopentane	5.60696			
Pentane	7.71008			
2,2-Dimethylbutane	0.349992			

\* User Specified Values  
? Extrapolated or Approximate Values

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## Recoveries Report

Client Name	Job
Location	

Index	Summary Table lbmol/h			
2,3-Dimethylbutane	0.0245666			
Cyclopentane	0.60756			
2-Methylpentane	2.79211			
3-Methylpentane	1.75562			
Hexane	5.16133			
2,2-Dimethylpentane	0.0479873			
Methylcyclopentane	0.686547			
2,4-Dimethylpentane	0.161383			
Benzene	0.0951034			
3,3-Dimethylpentane	0.033116			
Cyclohexane	0.697085			
2-Methylhexane	1.16596			
2,3-Dimethylpentane	0.25372			
3-Methylhexane	1.37777			
3-Ethylpentane	0.140176			
2,2,4-Trimethylpentane	0.139102			
Heptane	2.83608			
Methylcyclohexane	1.74787			
2,5-Dimethylhexane	0.132769			
2,4-Dimethylhexane	0.158699			
Ethylcyclopentane	0.00328818			
Toluene	0.261603			
2-Methylheptane	0.957164			
4-Methylheptane	0.386681			
3-Methylheptane	0.701721			
cis-1,3-Dimethylcyclohexane	0.291968			
Octane	1.1905			
trans-1,2-Dimethylcyclohexane	0.100515			
trans-1,3-Dimethylcyclohexane	0.11746			
cis-1,2-Dimethylcyclohexane	0.154422			
Ethylcyclohexane	0.199342			
Ethylbenzene	0.0622209			
m-Xylene	0.972563			
o-Xylene	0.0448255			
Nonane	0.565467			
Cumene	0.0802253			
Cyclooctane	0.0540139			
Propylcyclohexane	0.0933364			
Propylbenzene	0.032248			
Mesitylene	0.133371			
tert-Butylbenzene	0.000311126			
1,2,4-Trimethylbenzene	0.0712744			
Cyclohexane, Isobutyl-	0.18639			
Decane	0.0897289			
Isobutylbenzene	0.0662414			
sec-Butylbenzene	0.0612147			
1,2,3-Trimethylbenzene	0.150279			
Cyclohexane, Butyl-	0.0389075			
Butylbenzene	0.106985			
Water	80.9875			

Remarks

**Component Recoveries - Project Losses**

Status: **Solved**

## Recoveries Report

Client Name		Job
Location		

### Reference Stream Data Source - All Outlets in Project

Flowsheet	PStream	Flowsheet	PStream
Flowsheet1	Non-VOCs	Flowsheet1	Trucked Liquid
Flowsheet1	To Flare	Flowsheet1	VOCs

### Recovery Stream Data Source - All Inlets in Project

Flowsheet	PStream	Flowsheet	PStream
Flowsheet1	Condensate Ave	Flowsheet1	Water
Flowsheet1	Pigged Liquids	Flowsheet1	Y Grade Ave

### Parameters

* Composition Basis	Molar Flow	* Atomic Basis	False
* Calculate Ratios	False	* Summation Only	True

### Tabulated Data

Index	Summary Table lbmol/h			
Nitrogen	2.81247E-11			
Carbon Dioxide	9.4759E-09			
Methane	1.22004E-07			
Ethane	1.53643E-06			
Propane	8.26279E-07			
Isobutane	1.18594E-07			
Butane	3.71981E-07			
Isopentane	9.69443E-08			
Pentane	1.27007E-07			
2,2-Dimethylbutane	5.08355E-09			
2,3-Dimethylbutane	3.15289E-10			
Cyclopentane	9.06268E-09			
2-Methylpentane	3.42824E-08			
3-Methylpentane	2.01078E-08			
Hexane	5.05749E-08			
2,2-Dimethylpentane	3.1351E-10			
Methylcyclopentane	6.18099E-09			
2,4-Dimethylpentane	9.39665E-10			
Benzene	8.03584E-10			
3,3-Dimethylpentane	1.03358E-10			
Cyclohexane	4.34064E-09			
2-Methylhexane	3.04006E-10			
2,3-Dimethylpentane	2.21585E-10			
3-Methylhexane	-1.12578E-09			
3-Ethylpentane	-2.27426E-10			
2,2,4-Trimethylpentane	-4.97499E-10			
Heptane	-1.44417E-08			
Methylcyclohexane	-1.07591E-08			
2,5-Dimethylhexane	-1.89606E-09			
2,4-Dimethylhexane	-2.23851E-09			
Ethylcyclopentane	-2.9832E-11			
Toluene	-2.83639E-09			
2-Methylheptane	-2.32177E-08			
4-Methylheptane	-9.71494E-09			
3-Methylheptane	-1.85906E-08			
cis-1,3-Dimethylcyclohexane	-7.21939E-09			
Octane	-4.09464E-08			
trans-1,2-Dimethylcyclohexane	-2.82938E-09			
trans-1,3-Dimethylcyclohexane	-3.56217E-09			
cis-1,2-Dimethylcyclohexane	-5.64811E-09			
Ethylcyclohexane	-5.50084E-09			
Ethylbenzene	-2.68189E-09			

\* User Specified Values  
? Extrapolated or Approximate Values

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## Recoveries Report

Client Name		Job	
Location			

### Tabulated Data

Index	Summary Table lbmol/h			
m-Xylene	-4.78591E-08			
o-Xylene	-2.40678E-09			
Nonane	-4.12167E-08			
Cumene	-6.01399E-09			
Cyclooctane	-3.47954E-09			
Propylcyclohexane	-7.3339E-09			
Propylbenzene	-2.67098E-09			
Mesitylene	-1.22297E-08			
tert-Butylbenzene	-3.05842E-11			
1,2,4-Trimethylbenzene	-6.8251E-09			
Cyclohexane, Isobutyl-	-1.76554E-08			
Decane	-9.58592E-09			
Isobutylbenzene	-6.5993E-09			
sec-Butylbenzene	-6.46843E-09			
1,2,3-Trimethylbenzene	-1.51584E-08			
Cyclohexane, Butyl-	-4.34135E-09			
Butylbenzene	-1.23161E-08			
Water	-2.98522E-06			

Remarks

### Component Recoveries - Project Recoveries

Status Solved

#### Reference Stream Data Source - All Inlets in Project

Flowsheet	PStream	Flowsheet	PStream
Flowsheet1	Condensate Ave	Flowsheet1	Water
Flowsheet1	Pigged Liquids	Flowsheet1	Y Grade Ave

#### Recovery Stream Data Source - All Outlets in Project

Flowsheet	PStream	Flowsheet	PStream
Flowsheet1	Non-VOCs	Flowsheet1	Trucked Liquid
Flowsheet1	To Flare	Flowsheet1	VOCs

### Parameters

* Composition Basis	Molar Flow	* Atomic Basis	False
* Calculate Ratios	True	* Summation Only	False

### Tabulated Data

Index	Flowsheet1 Non-VOCs %	Flowsheet1 To Flare %	Flowsheet1 Trucked Liquid %	Flowsheet1:VOCs %
Nitrogen	0	99.9952	0.0048338	0
Carbon Dioxide	0	99.9477	0.052277	0
Methane	0	99.9848	0.0152202	0
Ethane	0	99.9227	0.0772558	0
Propane	0	99.762	0.237955	0
Isobutane	0	99.4445	0.555502	0
Butane	0	99.2323	0.767708	0
Isopentane	0	98.2448	1.75515	0
Pentane	0	97.7432	2.25677	0
2,2-Dimethylbutane	0	96.5473	3.45267	0
2,3-Dimethylbutane	0	95.5093	4.49071	0
Cyclopentane	0	96.787	3.21305	0
2-Methylpentane	0	95.1682	4.83183	0

\* User Specified Values  
? Extrapolated or Approximate Values

## Recoveries Report

Client Name		Job	
Location			

### Tabulated Data

Index	Flowsheet1:Nonr-VOCs %	Flowsheet1.To Flare %	Flowsheet1.Trucked Liquid %	Flowsheet1 VOCs %
3-Methylpentane	0	94.6616	5.33835	0
Hexane	0	93.646	6.35404	0
2,2-Dimethylpentane	0	91.6411	8.35888	0
Methylcyclopentane	0	93.1569	6.84306	0
2,4-Dimethylpentane	0	91.2048	8.79515	0
Benzene	0	92.7938	7.20616	0
3,3-Dimethylpentane	0	89.5463	10.4537	0
Cyclohexane	0	91.4524	8.54758	0
2-Methylhexane	0	87.7903	12.2097	0
2,3-Dimethylpentane	0	88.1664	11.8336	0
3-Methylhexane	0	87.1286	12.8714	0
3-Ethylpentane	0	86.6335	13.3665	0
2,2,4-Trimethylpentane	0	85.4346	14.5654	0
Heptane	0	84.5041	15.4959	0
Methylcyclohexane	0	83.851	16.149	0
2,5-Dimethylhexane	0	78.8629	21.1371	0
2,4-Dimethylhexane	0	78.9707	21.0293	0
Ethylcyclopentane	0	82.0605	17.9395	0
Toluene	0	80.9602	19.0398	0
2-Methylheptane	0	72.7385	27.2615	0
4-Methylheptane	0	72.2061	27.7939	0
3-Methylheptane	0	71.3657	28.6343	0
cis-1,3-Dimethylcyclohexane	0	72.4501	27.5499	0
Octane	0	66.5149	33.4851	0
trans-1,2-Dimethylcyclohexane	0	70.3491	29.6509	0
trans-1,3-Dimethylcyclohexane	0	69.012	30.988	0
cis-1,2-Dimethylcyclohexane	0	65.1755	34.8245	0
Ethylcyclohexane	0	70.6888	29.3112	0
Ethylbenzene	0	61.1601	38.8399	0
m-Xylene	0	57.4121	42.5879	0
o-Xylene	0	54.6581	45.3419	0
Nonane	0	42.8817	57.1183	0
Cumene	0	41.6048	58.3952	0
Cyclooctane	0	48.0818	51.9182	0
Propylcyclohexane	0	39.3914	60.6086	0
Propylbenzene	0	36.778	63.222	0
Mesitylene	0	31.3325	68.6675	0
tert-Butylbenzene	0	27.2798	72.7202	0
1,2,4-Trimethylbenzene	0	28.8386	71.1614	0
Cyclohexane, Isobutyl-	0	29.4778	70.5222	0
Decane	0	22.0437	77.9563	0
Isobutylbenzene	0	26.4616	73.5384	0
sec-Butylbenzene	0	22.7571	77.2429	0
1,2,3-Trimethylbenzene	0	25.6987	74.3013	0
Cyclohexane, Butyl-	0	19.128	80.872	0
Butylbenzene	0	16.9545	83.0456	0
Water	0	21.6031	78.3969	0

Index	Summary Table %			
Nitrogen	100			
Carbon Dioxide	100			
Methane	100			
Ethane	100			
Propane	100			
Isobutane	100			

\* User Specified Values  
? Extrapolated or Approximate Values

## Recoveries Report

Client Name		Job
Location		

Index	Summary Table %			
Butane	100			
Isopentane	100			
Pentane	100			
2,2-Dimethylbutane	100			
2,3-Dimethylbutane	100			
Cyclopentane	100			
2-Methylpentane	100			
3-Methylpentane	100			
Hexane	100			
2,2-Dimethylpentane	100			
Methylcyclopentane	100			
2,4-Dimethylpentane	100			
Benzene	100			
3,3-Dimethylpentane	100			
Cyclohexane	100			
2-Methylhexane	100			
2,3-Dimethylpentane	100			
3-Methylhexane	100			
3-Ethylpentane	100			
2,2,4-Trimethylpentane	100			
Heptane	100			
Methylcyclohexane	100			
2,5-Dimethylhexane	100			
2,4-Dimethylhexane	100			
Ethylcyclopentane	100			
Toluene	100			
2-Methylheptane	100			
4-Methylheptane	100			
3-Methylheptane	100			
cis-1,3-Dimethylcyclohexane	100			
Octane	100			
trans-1,2-Dimethylcyclohexane	100			
trans-1,3-Dimethylcyclohexane	100			
cis-1,2-Dimethylcyclohexane	100			
Ethylcyclohexane	100			
Ethylbenzene	100			
m-Xylene	100			
o-Xylene	100			
Nonane	100			
Cumene	100			
Cyclooctane	100			
Propylcyclohexane	100			
Propylbenzene	100			
Mesitylene	100			
tert-Butylbenzene	100			
1,2,4-Trimethylbenzene	100			
Cyclohexane, Isobutyl-	100			
Decane	100			
Isobutylbenzene	100			
sec-Butylbenzene	100			
1,2,3-Trimethylbenzene	100			
Cyclohexane, Butyl-	100			
Butylbenzene	100			
Water	100			

Remarks

## Recoveries Report

Client Name		Job
Location		

### Component Recoveries - Flowsheet1 Inlets

Status Solved

### Recovery Stream Data Source - All Inlets in Flowsheet

Flowsheet	PStream	Flowsheet	PStream
Flowsheet1	Condensate Ave	Flowsheet1	Water
Flowsheet1	Pigged Liquids	Flowsheet1	Y Grade Ave

### Parameters

* Composition Basis	Molar Flow	* Atomic Basis	False
* Calculate Ratios	False	* Summation Only	False

### Tabulated Data

Index	Flowsheet1:Condensate Ave lbmol/h	Flowsheet1 Pigged Liquids lbmol/h	Flowsheet1:Water lbmol/h	Flowsheet1:Y Grade Ave lbmol/h
Nitrogen	0	0.00139634	0	3.17357E-08
Carbon Dioxide	0.0286105	0.00154272	0	0.441819
Methane	2.371	0.427457	0	3.26397
Ethane	7.40706	0.355458	0	68.9686
Propane	17.1139	0.306865	0	24.3912
Isobutane	3.98306	0.0543118	0	2.12527
Butane	14.4361	0.176091	0	5.07081
Isopentane	4.80009	0.0548019	0	0.752074
Pentane	6.7603	0.0808677	0	0.868912
2,2-Dimethylbutane	0.3345	0.0020792	0	0.0134125
2,3-Dimethylbutane	0	0.00428474	0	0.0202819
Cyclopentane	0.60756	0	0	0
2-Methylpentane	2.66831	0.0236489	0	0.100148
3-Methylpentane	1.68414	0.014965	0	0.0565094
Hexane	4.99805	0.0409023	0	0.122374
2,2-Dimethylpentane	0.0460398	0.000587127	0	0.00136038
Methylcyclopentane	0.669548	0.00430988	0	0.0126885
2,4-Dimethylpentane	0.161383	0	0	0
Benzene	0.0930937	0.000453643	0	0.00155607
3,3-Dimethylpentane	0.033116	0	0	0
Cyclohexane	0.683296	0.00388198	0	0.00990726
2-Methylhexane	1.14298	0.00992302	0	0.0130619
2,3-Dimethylpentane	0.247726	0.00244886	0	0.00354524
3-Methylhexane	1.3446	0.0147349	0	0.0184388
3-Ethylpentane	0.137779	0.00107791	0	0.00131842
2,2,4-Trimethylpentane	0.136327	0.00127888	0	0.0014964
Heptane	2.79056	0.0224092	0	0.0231065
Methylcyclohexane	1.72512	0.0114858	0	0.0112645
2,5-Dimethylhexane	0.13114	0.000987601	0	0.000641285
2,4-Dimethylhexane	0.158699	0	0	0
Ethylcyclopentane	0	0.00184479	0	0.00144339
Toluene	0.257888	0.00199637	0	0.00171805
2-Methylheptane	0.947742	0.00674225	0	0.00267881
4-Methylheptane	0.382995	0.00261839	0	0.00106796
3-Methylheptane	0.694993	0.00483101	0	0.0018965
cis-1,3-Dimethylcyclohexane	0.288296	0.00265603	0	0.00101652
Octane	1.17833	0.00933063	0	0.00284154
trans-1,2-Dimethylcyclohexane	0.0995525	0.00071744	0	0.000245029
trans-1,3-Dimethylcyclohexane	0.117135	0.000248263	0	7.62135E-05
cis-1,2-Dimethylcyclohexane	0.154422	0	0	0
Ethylcyclohexane	0.197309	0.00147666	0	0.000555703
Ethylbenzene	0.0619157	0.000243817	0	6.13073E-05
m-Xylene	0.97029	0.00188445	0	0.000388245
o-Xylene	0.0444931	0.000281325	0	5.11343E-05

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? Extrapolated or Approximate Values

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## Recoveries Report

Client Name		Job
Location		

### Tabulated Data

Index	Flowsheet1.Condensate Ave lbmol/h	Flowsheet1.Pigged Liquids lbmol/h	Flowsheet1:Water lbmol/h	Flowsheet1.Y Grade Ave lbmol/h
Nonane	0.562571	0.00269539	0	0.000199984
Cumene	0.0799818	0.000224361	0	1.91701E-05
Cyclooctane	0.0535863	0.000384961	0	4.26257E-05
Propylcyclohexane	0.0927733	0.00052003	0	4.31192E-05
Propylbenzene	0.032248	0	0	0
Mesitylene	0.132819	0.000520137	0	3.11663E-05
tert-Butylbenzene	0	0.000300368	0	1.07581E-05
1,2,4-Trimethylbenzene	0.0712744	0	0	0
Cyclohexane, Isobutyl-	0.18639	0	0	0
Decane	0.0887915	0.000910135	0	2.72204E-05
Isobutylbenzene	0.0662414	0	0	0
sec-Butylbenzene	0.0612147	0	0	0
1,2,3-Trimethylbenzene	0.150279	0	0	0
Cyclohexane, Butyl-	0.0389075	0	0	0
Butylbenzene	0.106985	0	0	0
Water	0	0.000162461	80.9874	0

Index	Summary Table lbmol/h			
Nitrogen	0.00139637			
Carbon Dioxide	0.471972			
Methane	6.06243			
Ethane	76.7311			
Propane	41.812			
Isobutane	6.16264			
Butane	19.683			
Isopentane	5.60696			
Pentane	7.71008			
2,2-Dimethylbutane	0.349992			
2,3-Dimethylbutane	0.0245666			
Cyclopentane	0.60756			
2-Methylpentane	2.79211			
3-Methylpentane	1.75562			
Hexane	5.16133			
2,2-Dimethylpentane	0.0479873			
Methylcyclopentane	0.686547			
2,4-Dimethylpentane	0.161383			
Benzene	0.0951034			
3,3-Dimethylpentane	0.033116			
Cyclohexane	0.697085			
2-Methylhexane	1.16596			
2,3-Dimethylpentane	0.25372			
3-Methylhexane	1.37777			
3-Ethylpentane	0.140176			
2,2,4-Trimethylpentane	0.139102			
Heptane	2.83608			
Methylcyclohexane	1.74787			
2,5-Dimethylhexane	0.132769			
2,4-Dimethylhexane	0.158699			
Ethylcyclopentane	0.00328818			
Toluene	0.261603			
2-Methylheptane	0.957164			
4-Methylheptane	0.386681			
3-Methylheptane	0.701721			
cis-1,3-Dimethylcyclohexane	0.291968			
Octane	1.1905			
trans-1,2-Dimethylcyclohexane	0.100515			

\* User Specified Values  
? Extrapolated or Approximate Values

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## Recoveries Report

Client Name		Job
Location		

Index	Summary Table lbmol/h			
trans-1,3-Dimethylcyclohexane	0.11746			
cis-1,2-Dimethylcyclohexane	0.154422			
Ethylcyclohexane	0.199342			
Ethylbenzene	0.0622209			
m-Xylene	0.972563			
o-Xylene	0.0448255			
Nonane	0.565467			
Cumene	0.0802253			
Cyclooctane	0.0540139			
Propylcyclohexane	0.0933364			
Propylbenzene	0.032248			
Mesitylene	0.133371			
tert-Butylbenzene	0.000311126			
1,2,4-Trimethylbenzene	0.0712744			
Cyclohexane, Isobutyl-	0.18639			
Decane	0.0897289			
Isobutylbenzene	0.0662414			
sec-Butylbenzene	0.0612147			
1,2,3-Trimethylbenzene	0.150279			
Cyclohexane, Butyl-	0.0389075			
Butylbenzene	0.106985			
Water	80.9875			

**Remarks**

Component Recoveries - Flowsheet1 Outlets				Status	Solved
Recovery Stream Data Source - All Outlets in Flowsheet					
Flowsheet	PStream	Flowsheet	PStream		
Flowsheet1	Non-VOCs	Flowsheet1	Trucked Liquid		
Flowsheet1	To Flare	Flowsheet1	VOCs		

Parameters			
* Composition Basis	Molar Flow	* Atomic Basis	False
* Calculate Ratios	False	* Summation Only	False

Tabulated Data				
Index	Flowsheet1 Non-VOCs lbmol/h	Flowsheet1.To Flare lbmol/h	Flowsheet1.Trucked Liquid lbmol/h	Flowsheet1:VOCs lbmol/h
Nitrogen	0	0.0013963	6.74978E-08	0
Carbon Dioxide	0	0.471725	0.000246733	0
Methane	0	6.06151	0.000922716	0
Ethane	0	76.6718	0.0592792	0
Propane	0	41.7125	0.0994938	0
Isobutane	0	6.12841	0.0342336	0
Butane	0	19.5319	0.151108	0
Isopentane	0	5.50855	0.0984108	0
Pentane	0	7.53608	0.173999	0
2,2-Dimethylbutane	0	0.337907	0.0120841	0
2,3-Dimethylbutane	0	0.0234634	0.00110322	0
Cyclopentane	0	0.588038	0.0195212	0
2-Methylpentane	0	2.6572	0.13491	0
3-Methylpentane	0	1.6619	0.0937211	0
Hexane	0	4.83338	0.327953	0

\* User Specified Values  
 ? Extrapolated or Approximate Values

## Recoveries Report

Client Name		Job
Location		

### Tabulated Data

Index	Flowsheet1:Non-VOCs lbmol/h	Flowsheet1:To Flare lbmol/h	Flowsheet1:Trucked Liquid lbmol/h	Flowsheet1.VOCs lbmol/h
2,2-Dimethylpentane	0	0.0439761	0.0040112	0
Methylcyclopentane	0	0.639566	0.0469808	0
2,4-Dimethylpentane	0	0.147189	0.0141939	0
Benzene	0	0.0882501	0.0068533	0
3,3-Dimethylpentane	0	0.0296542	0.00346184	0
Cyclohexane	0	0.637501	0.0595839	0
2-Methylhexane	0	1.0236	0.14236	0
2,3-Dimethylpentane	0	0.223696	0.0300242	0
3-Methylhexane	0	1.20044	0.177339	0
3-Ethylpentane	0	0.121439	0.0187366	0
2,2,4-Trimethylpentane	0	0.118841	0.0202608	0
Heptane	0	2.3966	0.439476	0
Methylcyclohexane	0	1.46561	0.282263	0
2,5-Dimethylhexane	0	0.104706	0.0280635	0
2,4-Dimethylhexane	0	0.125326	0.0333733	0
Ethylcyclopentane	0	0.00269829	0.000589883	0
Toluene	0	0.211794	0.0498086	0
2-Methylheptane	0	0.696226	0.260937	0
4-Methylheptane	0	0.279207	0.107474	0
3-Methylheptane	0	0.500788	0.200933	0
cis-1,3-Dimethylcyclohexane	0	0.211531	0.0804371	0
Octane	0	0.791861	0.398641	0
trans-1,2-Dimethylcyclohexane	0	0.0707114	0.0298036	0
trans-1,3-Dimethylcyclohexane	0	0.0810613	0.0363984	0
cis-1,2-Dimethylcyclohexane	0	0.100645	0.0537765	0
Ethylcyclohexane	0	0.140912	0.0584294	0
Ethylbenzene	0	0.0380544	0.0241665	0
m-Xylene	0	0.558368	0.414194	0
o-Xylene	0	0.0245008	0.0203248	0
Nonane	0	0.242482	0.322985	0
Cumene	0	0.0333776	0.0468477	0
Cyclooctane	0	0.0259708	0.0280431	0
Propylcyclohexane	0	0.0367665	0.0565699	0
Propylbenzene	0	0.0118601	0.0203878	0
Mesitylene	0	0.0417883	0.0915824	0
tert-Butylbenzene	0	8.48746E-05	0.000226252	0
1,2,4-Trimethylbenzene	0	0.0205546	0.0507199	0
Cyclohexane, Isobutyl-	0	0.0549437	0.131446	0
Decane	0	0.0197796	0.0699493	0
Isobutylbenzene	0	0.0175286	0.0487128	0
sec-Butylbenzene	0	0.0139307	0.047284	0
1,2,3-Trimethylbenzene	0	0.0386197	0.111659	0
Cyclohexane, Butyl-	0	0.00744224	0.0314653	0
Butylbenzene	0	0.0181386	0.0888459	0
Water	0	17.4958	63.4917	0

Index	Summary Table lbmol/h			
Nitrogen	0.00139637			
Carbon Dioxide	0.471972			
Methane	6.06243			
Ethane	76.7311			
Propane	41.812			
Isobutane	6.16264			
Butane	19.683			
Isopentane	5.60696			

\* User Specified Values  
? Extrapolated or Approximate Values

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## Recoveries Report

Client Name		Job
Location		

Index	Summary Table lbmol/h			
Pentane	7.71008			
2,2-Dimethylbutane	0.349992			
2,3-Dimethylbutane	0.0245666			
Cyclopentane	0.60756			
2-Methylpentane	2.79211			
3-Methylpentane	1.75562			
Hexane	5.16133			
2,2-Dimethylpentane	0.0479873			
Methylcyclopentane	0.686547			
2,4-Dimethylpentane	0.161383			
Benzene	0.0951034			
3,3-Dimethylpentane	0.033116			
Cyclohexane	0.697085			
2-Methylhexane	1.16596			
2,3-Dimethylpentane	0.25372			
3-Methylhexane	1.37777			
3-Ethylpentane	0.140176			
2,2,4-Trimethylpentane	0.139102			
Heptane	2.83608			
Methylcyclohexane	1.74787			
2,5-Dimethylhexane	0.132769			
2,4-Dimethylhexane	0.158699			
Ethylcyclopentane	0.00328818			
Toluene	0.261603			
2-Methylheptane	0.957164			
4-Methylheptane	0.386681			
3-Methylheptane	0.701721			
cis-1,3-Dimethylcyclohexane	0.291968			
Octane	1.1905			
trans-1,2-Dimethylcyclohexane	0.100515			
trans-1,3-Dimethylcyclohexane	0.11746			
cis-1,2-Dimethylcyclohexane	0.154422			
Ethylcyclohexane	0.199342			
Ethylbenzene	0.0622209			
m-Xylene	0.972563			
o-Xylene	0.0448255			
Nonane	0.565467			
Cumene	0.0802253			
Cyclooctane	0.0540139			
Propylcyclohexane	0.0933364			
Propylbenzene	0.032248			
Mesitylene	0.133371			
tert-Butylbenzene	0.000311126			
1,2,4-Trimethylbenzene	0.0712744			
Cyclohexane, Isobutyl-	0.18639			
Decane	0.0897289			
Isobutylbenzene	0.0662414			
sec-Butylbenzene	0.0612147			
1,2,3-Trimethylbenzene	0.150279			
Cyclohexane, Butyl-	0.0389075			
Butylbenzene	0.106985			
Water	80.9875			

Remarks

## Recoveries Report

Client Name	Job
Location	

### Component Recoveries - Flowsheet1 Losses

Status Solved

#### Reference Stream Data Source - All Outlets in Flowsheet

Flowsheet	PStream	Flowsheet	PStream
Flowsheet1	Non-VOCs	Flowsheet1	Trucked Liquid
Flowsheet1	To Flare	Flowsheet1	VOCs

#### Recovery Stream Data Source - All Inlets in Flowsheet

Flowsheet	PStream	Flowsheet	PStream
Flowsheet1	Condensate Ave	Flowsheet1	Water
Flowsheet1	Pigged Liquids	Flowsheet1	Y Grade Ave

#### Parameters

* Composition Basis	Molar Flow	* Atomic Basis	False
* Calculate Ratios	False	* Summation Only	True

#### Tabulated Data

Index	Summary Table lbmol/h			
Nitrogen	2.81247E-11			
Carbon Dioxide	9.4759E-09			
Methane	1.22004E-07			
Ethane	1.53643E-06			
Propane	8.26279E-07			
Isobutane	1.18594E-07			
Butane	3.71981E-07			
Isopentane	9.69443E-08			
Pentane	1.27007E-07			
2,2-Dimethylbutane	5.08355E-09			
2,3-Dimethylbutane	3.15289E-10			
Cyclopentane	9.06268E-09			
2-Methylpentane	3.42824E-08			
3-Methylpentane	2.01078E-08			
Hexane	5.05749E-08			
2,2-Dimethylpentane	3.1351E-10			
Methylcyclopentane	6.18099E-09			
2,4-Dimethylpentane	9.39665E-10			
Benzene	8.03584E-10			
3,3-Dimethylpentane	1.03358E-10			
Cyclohexane	4.34064E-09			
2-Methylhexane	3.04006E-10			
2,3-Dimethylpentane	2.21585E-10			
3-Methylhexane	-1.12578E-09			
3-Ethylpentane	-2.27426E-10			
2,2,4-Trimethylpentane	-4.97499E-10			
Heptane	-1.44417E-08			
Methylcyclohexane	-1.07591E-08			
2,5-Dimethylhexane	-1.89606E-09			
2,4-Dimethylhexane	-2.23851E-09			
Ethylcyclopentane	-2.9832E-11			
Toluene	-2.83639E-09			
2-Methylheptane	-2.32177E-08			
4-Methylheptane	-9.71494E-09			
3-Methylheptane	-1.85906E-08			
cis-1,3-Dimethylcyclohexane	-7.21939E-09			
Octane	-4.09464E-08			
trans-1,2-Dimethylcyclohexane	-2.82938E-09			
trans-1,3-Dimethylcyclohexane	-3.56217E-09			
cis-1,2-Dimethylcyclohexane	-5.64811E-09			

\* User Specified Values  
? Extrapolated or Approximate Values

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## Recoveries Report

Client Name		Job	
Location			

### Tabulated Data

Index	Summary Table lbmol/h		
Ethylcyclohexane	-5.50084E-09		
Ethylbenzene	-2.68189E-09		
m-Xylene	-4.78591E-08		
o-Xylene	-2.40678E-09		
Nonane	-4.12167E-08		
Cumene	-6.01399E-09		
Cyclooctane	-3.47954E-09		
Propylcyclohexane	-7.3339E-09		
Propylbenzene	-2.67098E-09		
Mesitylene	-1.22297E-08		
tert-Butylbenzene	-3.05842E-11		
1,2,4-Trimethylbenzene	-6.8251E-09		
Cyclohexane, Isobutyl-	-1.76554E-08		
Decane	-9.58592E-09		
Isobutylbenzene	-6.5993E-09		
sec-Butylbenzene	-6.46843E-09		
1,2,3-Trimethylbenzene	-1.51584E-08		
Cyclohexane, Butyl-	-4.34135E-09		
Butylbenzene	-1.23161E-08		
Water	-2.98522E-06		

Remarks

### Component Recoveries - Flowsheet1 Recoveries

Status Solved

#### Reference Stream Data Source - All Inlets in Flowsheet

Flowsheet	PStream	Flowsheet	PStream
Flowsheet1	Condensate Ave	Flowsheet1	Water
Flowsheet1	Pigged Liquids	Flowsheet1	Y Grade Ave

#### Recovery Stream Data Source - All Outlets in Flowsheet

Flowsheet	PStream	Flowsheet	PStream
Flowsheet1	Non-VOCs	Flowsheet1	Trucked Liquid
Flowsheet1	To Flare	Flowsheet1	VOCs

### Parameters

* Composition Basis	Molar Flow	* Atomic Basis	False
* Calculate Ratios	True	* Summation Only	False

### Tabulated Data

Index	Flowsheet1:Non-VOCs %	Flowsheet1:To Flare %	Flowsheet1.Trucked Liquid %	Flowsheet1 VOCs %
Nitrogen	0	99.9952	0.0048338	0
Carbon Dioxide	0	99.9477	0.052277	0
Methane	0	99.9848	0.0152202	0
Ethane	0	99.9227	0.0772558	0
Propane	0	99.762	0.237955	0
Isobutane	0	99.4445	0.555502	0
Butane	0	99.2323	0.767708	0
Isopentane	0	98.2448	1.75515	0
Pentane	0	97.7432	2.25677	0
2,2-Dimethylbutane	0	96.5473	3.45267	0
2,3-Dimethylbutane	0	95.5093	4.49071	0

\* User Specified Values  
? Extrapolated or Approximate Values

## Recoveries Report

Client Name		Job
Location		

### Tabulated Data

Index	Flowsheet1:Non-VOCs %	Flowsheet1:To Flare %	Flowsheet1:Trucked Liquid %	Flowsheet1:VOCs %
Cyclopentane	0	96.787	3.21305	0
2-Methylpentane	0	95.1682	4.83183	0
3-Methylpentane	0	94.6616	5.33835	0
Hexane	0	93.646	6.35404	0
2,2-Dimethylpentane	0	91.6411	8.35888	0
Methylcyclopentane	0	93.1569	6.84306	0
2,4-Dimethylpentane	0	91.2048	8.79515	0
Benzene	0	92.7938	7.20616	0
3,3-Dimethylpentane	0	89.5463	10.4537	0
Cyclohexane	0	91.4524	8.54758	0
2-Methylhexane	0	87.7903	12.2097	0
2,3-Dimethylpentane	0	88.1664	11.8336	0
3-Methylhexane	0	87.1286	12.8714	0
3-Ethylpentane	0	86.6335	13.3665	0
2,2,4-Trimethylpentane	0	85.4346	14.5654	0
Heptane	0	84.5041	15.4959	0
Methylcyclohexane	0	83.851	16.149	0
2,5-Dimethylhexane	0	78.8629	21.1371	0
2,4-Dimethylhexane	0	78.9707	21.0293	0
Ethylcyclopentane	0	82.0605	17.9395	0
Toluene	0	80.9602	19.0398	0
2-Methylheptane	0	72.7385	27.2615	0
4-Methylheptane	0	72.2061	27.7939	0
3-Methylheptane	0	71.3657	28.6343	0
cis-1,3-Dimethylcyclohexane	0	72.4501	27.5499	0
Octane	0	66.5149	33.4851	0
trans-1,2-Dimethylcyclohexane	0	70.3491	29.6509	0
trans-1,3-Dimethylcyclohexane	0	69.012	30.988	0
cis-1,2-Dimethylcyclohexane	0	65.1755	34.8245	0
Ethylcyclohexane	0	70.6888	29.3112	0
Ethylbenzene	0	61.1601	38.8399	0
m-Xylene	0	57.4121	42.5879	0
o-Xylene	0	54.6581	45.3419	0
Nonane	0	42.8817	57.1183	0
Cumene	0	41.6048	58.3952	0
Cyclooctane	0	48.0818	51.9182	0
Propylcyclohexane	0	39.3914	60.6086	0
Propylbenzene	0	36.778	63.222	0
Mesitylene	0	31.3325	68.6675	0
tert-Butylbenzene	0	27.2798	72.7202	0
1,2,4-Trimethylbenzene	0	28.8386	71.1614	0
Cyclohexane, Isobutyl-	0	29.4778	70.5222	0
Decane	0	22.0437	77.9563	0
Isobutylbenzene	0	26.4616	73.5384	0
sec-Butylbenzene	0	22.7571	77.2429	0
1,2,3-Trimethylbenzene	0	25.6987	74.3013	0
Cyclohexane, Butyl-	0	19.128	80.872	0
Butylbenzene	0	16.9545	83.0456	0
Water	0	21.6031	78.3969	0

Index	Summary Table %			
Nitrogen	100			
Carbon Dioxide	100			
Methane	100			
Ethane	100			

## Recoveries Report

Client Name		Job	
Location			

Index	Summary Table %			
Propane	100			
Isobutane	100			
Butane	100			
Isopentane	100			
Pentane	100			
2,2-Dimethylbutane	100			
2,3-Dimethylbutane	100			
Cyclopentane	100			
2-Methylpentane	100			
3-Methylpentane	100			
Hexane	100			
2,2-Dimethylpentane	100			
Methylcyclopentane	100			
2,4-Dimethylpentane	100			
Benzene	100			
3,3-Dimethylpentane	100			
Cyclohexane	100			
2-Methylhexane	100			
2,3-Dimethylpentane	100			
3-Methylhexane	100			
3-Ethylpentane	100			
2,2,4-Trimethylpentane	100			
Heptane	100			
Methylcyclohexane	100			
2,5-Dimethylhexane	100			
2,4-Dimethylhexane	100			
Ethylcyclopentane	100			
Toluene	100			
2-Methylheptane	100			
4-Methylheptane	100			
3-Methylheptane	100			
cis-1,3-Dimethylcyclohexane	100			
Octane	100			
trans-1,2-Dimethylcyclohexane	100			
trans-1,3-Dimethylcyclohexane	100			
cis-1,2-Dimethylcyclohexane	100			
Ethylcyclohexane	100			
Ethylbenzene	100			
m-Xylene	100			
o-Xylene	100			
Nonane	100			
Cumene	100			
Cyclooctane	100			
Propylcyclohexane	100			
Propylbenzene	100			
Mesitylene	100			
tert-Butylbenzene	100			
1,2,4-Trimethylbenzene	100			
Cyclohexane, Isobutyl-	100			
Decane	100			
Isobutylbenzene	100			
sec-Butylbenzene	100			
1,2,3-Trimethylbenzene	100			
Cyclohexane, Butyl-	100			
Butylbenzene	100			
Water	100			

**Remarks**

\* User Specified Values  
 ? Extrapolated or Approximate Values

<b>Recoveries Report</b>		
<b>Client Name</b>		<b>Job</b>
<b>Location</b>		

## Energy Budgets Report

Client Name		Job
Location		

### Heat Budget - Project Power Budget

Status Solved

#### Parameters

Net Power	0 hp	Total Power Required	0 hp
Total Power Supplied	0 hp		

Remarks

### Heat Budget - Project Heat Budget

Status Solved

#### Heat Budget Data Source - All in Project

Flowsheet	Block	Flowsheet	Block
Flowsheet1	Common Heat Loss	Flowsheet1	Not Real
Flowsheet1	DVDR-1	Flowsheet1	Slop Heat Loss

#### Parameters

Net Duty	984825 Btu/h	Total Duty Required	1.05471E+06 Btu/h
Total Duty Supplied	69882.3 Btu/h		

#### Tabulated Data

Index	Block Duty Btu/h	Block Highest Temperature °F	Block Lowest Temperature °F
Flowsheet1:Common Heat Loss	803174	120	70
Flowsheet1:DVDR-1	0	70	70
Flowsheet1:Not Real	251534	70	49.7529
Flowsheet1:Slop Heat Loss	-69882.3	120	70

Remarks

### Heat Budget - Flowsheet1 Power Budget

Status Solved

#### Parameters

Net Power	0 hp	Total Power Required	0 hp
Total Power Supplied	0 hp		

Remarks

### Heat Budget - Flowsheet1 Heat Budget

Status Solved

#### Heat Budget Data Source - All in Flowsheet

Flowsheet	Block	Flowsheet	Block
Flowsheet1	Common Heat Loss	Flowsheet1	Not Real
Flowsheet1	DVDR-1	Flowsheet1	Slop Heat Loss

#### Parameters

Net Duty	984825 Btu/h	Total Duty Required	1.05471E+06 Btu/h
Total Duty Supplied	69882.3 Btu/h		

\* User Specified Values  
? Extrapolated or Approximate Values

## Energy Budgets Report

Client Name		Job
Location		

### Tabulated Data

Index	Block Duty Btu/h	Block Highest Temperature °F	Block Lowest Temperature °F	
Flowsheet1:Common Heat Loss	803174	120	70	
Flowsheet1:DVDR-1	0	70	70	
Flowsheet1:Not Real	251534	70	49.7529	
Flowsheet1:Slop Heat Loss	-69882.3	120	70	

#### Remarks



west virginia department of environmental protection

Division of Air Quality  
601 57<sup>th</sup> Street SE  
Charleston, WV 25304  
Phone 304/926-0475

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

April 13, 2015

CERTIFIED MAIL

91 7199 9991 7034 1378 6065

Mr. Don Wicburg  
Vice President and General Manager  
Williams Ohio Valley Midstream LLC  
100 Teletech Drive  
Moundsville, WV 26041

RE: Application Status: Incomplete  
Williams Ohio Valley Midstream LLC  
Oak Grover Natural Gas Processing Facility  
Permit Application No. R13-3070A  
Plant ID No. 051-00157

Dear Mr. Wicburg:

Your application for a modification permit for a gas processing plant was received by this Division on January 13, 2015 and assigned to the writer for review. Upon initial review of said application, it has been determined that the application as submitted is incomplete based on the following items:

1. Your application claims that the process flare has a minimum guarantee combustion efficiency of 99%. The flare data sheets provided on March 25, 2015 notes that the Zeeco AFTA -24/80 "flare system is designed for 99% destruction efficiency or better." In the provide sheets, the design case notes the molecular weight of 20.0, L. H. V. of 1,1108 Btu/sfc, and a flow rate of 439,174 lbs/hr. For governing smokeless case, the smokeless rate is 87,350 lb/hr. Your application request to increase the maximum short term flow rate of waste gas to the flare up to 208,000 lb/hr, which is beyond the design conditions to operate the flare in a smokeless operation. The agency needs some sort of insurances that the flare will be able to achieve the emission standards under 45 CSR 6 and that the flare is achieving a destruction efficiency of 99% during smoking conditions.

Please provide calculations, drawing, and any other data used to determine the tip velocity in the application and as determined in the flare data sheets by the flare manufacturer. Please explain the difference between these two velocities.

NOD to Mr. Wicburg  
April 13, 2015  
Page 2 of 3

Please propose a standardize means of monitoring the operation of the flare that can be related back to manufacturer's destruction efficiency of 99%. If one cannot be proposed, please re-estimate your VOC and HAP emissions from the flare based on a destruction efficiency of 98%.

Please explain why the average purge gas in the application is 4,000 scf per hour and the flare design only requires 870 scf per hour of purge gas.

Please explain why the flow rate of pilot gas for the pilot lights listed in the application exceeds the manufacturer's specified rate.

Is Williams using this flare to achieve compliance of emission standard or part of LDAR requirement under Part 60? If so, please identify the sources and/or components that are or will be vent to the flare.

Is nitrogen used during maintenance related activities that would be purged into the flare header? If so, please determine the amount of nitrogen used on a maximum hourly and annual basis. This nitrogen would form thermal oxides of nitrogen that needs to be account with the potential emissions from the flare.

Please provide the gas analysis of the flare header that indicates compliance with 45 CSR §10-5.1. (50 grain H<sub>2</sub>S Standard). You may proposed an alternative means for demonstration compliance to be incorporated in the permit.

2. Please explain the reason for the increase in the design heat input of the TXP1 Hot Oil Heater, TXP1 Regen Gas Heater, TXP2 Regen Gas Heater, and TXP3 Regen Gas Heater. Are these new heaters? Would these heaters increase the processing rate of the natural gas through the extraction units?

Please clarify the fuel source for these heaters.

Does each heater has it own dedicated flow meter?

Please explain why there were these hourly operating limits in Permit Application R13-3070.

3. Please provide drawings of the facility's piping schematics.

Has or is MarkWest going to demonstrates that certain process equipment(s) and/or

NOD to Mr. Wicburg  
April 13, 2015  
Page 3 of 3

component(s) is not in VOC service? If so, please he and note which process streams are not in VOC service as defined in 40 CFR §60.5400(f) and methods used to determine the percent VOC content of the process fluid that is contained in or contacts a piece of equipment.

Please note if the facility is using the alternative work practice (optical gas imaging instrument) for LDAR in accordance with 40 FR §60.18(g). (See Federal Register/Vol. 73, No. 246.)

4. Please provide a complete report of the ProMax process simulation that indicates that increase of slop oil/condensate in the TK-1 through TK-4 does not generator any flash emissions. In addition, please identify the equation of state (EOS) used in this simulation.
5. Please provide a legible copy of the TANKs detailed report for the working and breathing losses from TK-1 though TK-4.
6. Please provide a complete report of the simulation that predicts the emissions from the deethanizer unit. In addition, please identify the EOS used in this simulation, inputs used, specific design parameters, and amine used in the process. The report needs to identify any other pollutants being released from the flash gas or acid gas streams.
7. Please explain how the "worst-case assumption" was formulated for the inlet compressor leaks.

Please address the above deficiencies in writing within fifteen (15) days of the receipt of this letter. Application review will not commence until the application has been deemed to be technically complete. Failure to respond to this request in a timely manner may result in the denial of the application. Should you have any questions, please contact me at (304) 926-0499 ext. 1214.

Sincerely,



Edward S. Andrews, P.E.  
Engineer

c: WVDEP/Division of Air Quality -= NPRO  
Danell Zawaski, P.E., Environmental Specialist  
William Thompson, Environmental Specialist

*Ed*



Williams Ohio Valley Midstream LLC  
Park Place Corporate Center 2  
2000 Commerce Drive  
Pittsburgh, PA 15275  
(412) 787-7300  
(412) 787-6006 fax

January 27, 2015

Ed Andrews  
WVDEP – Division of Air Quality  
601 57th Street, SE  
Charleston, WV 25304

ID No. 51-152 Reg. R13-3070A  
Williams  
Oak Grove  
Ed

Fedex Tracking number 7727 2769 6739

**Subject: Legal Notice for Oak Grove Gas Plant**

Dear DEP:

Attached is the original legal affidavit for Oak Grove Gas Plant that Williams ran the Moundsville Daily Echo newspaper on January 15, 2015. Additionally, a replacement check is included for \$2,000. Please contact me with any questions at (505)787-7926 or at [Danell.Zawaski@williams.com](mailto:Danell.Zawaski@williams.com).

Sincerely,

Danell Zawaski  
Environmental Specialist

**NON-CONFIDENTIAL**



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 / Oak Grove

NATURE (and agency if heard before one)

CERTIF-BILL TO

Williams Ohio Valley Midstream, LLC  
Park Place Corporate Center 2  
2000 Commerce Drive  
Pittsburgh, PA 15275

WAS PUBLISHED IN-SAID NEWSPAPER AS FOLLOWS

Times	Dates
1	January 15, 2015

BY WORDS 390	PUBLICATION CHARGES \$44.85
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(signed) Melanie S. Murdock

NOTARIZATION

Taken, sworn and subscribed before me this 16th day of January 2015

Amy McGlumphy  
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 New Source Review (NSR) Modification Permit for the existing Oak Grove Gas Plant (GP), located 3.7 Miles Southeast of Moundsville, and North of Fork Ridge Road, in Marshall County, West Virginia.

Latitude and longitude coordinates are 39.8758 degrees North and -80.6959 degrees West, respectively.

The applicant estimates the increase/ (decrease) in the potential to discharge the following Regulated Air Pollutants will be:

- 79.62 tons of nitrogen oxides per year
- 119.07 tons of carbon monoxide per year
- 40.96 tons of volatile organic compounds per year
- (0.69) tons of sulfur dioxide per year
- 5.10 tons of particulate matter per year
- (0.23) tons of benzene per year
- 2.04 tons of ethylbenzene per year
- 0.02 tons of formaldehyde per year
- 3.70 tons of n-hexane per year
- 1.96 tons of toluene per year
- 2.10 tons of 2,2,4-trimethylpentane per year
- 2.05 tons of xylenes per year
- (1.82) tons of total hazardous air pollutants per year
- 150,255 tons of carbon dioxide equivalent (CO<sub>2</sub>e) per year

Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 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 1227, during normal business hours.

Dated this the 12th day of January 2015.

By: Mr. Don Wicburg, Vice President and General Manager  
Williams Ohio Valley Midstream LLC

100 Teletech Drive, Suite 2  
Moundsville, WV 26041

PUBLISH: January 15, 2015.



**Andrews, Edward S**

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**From:** Rice, Jennifer L  
**Sent:** Thursday, January 15, 2015 8:35 AM  
**To:** don.wicburg@williams.com; danell.zawaski@williams.com  
**Cc:** Andrews, Edward S; McKeone, Beverly D  
**Subject:** WV DAQ Permit Application Status for Williams Ohio Valley Midstream; Oak Grove Plant

**RE: Application Status  
Williams Ohio Valley Midstream, LLC  
Oak Grove Plant  
Plant ID No. 051-00157  
Application No. R13-3070A**

Mr. Wicburg,

Your application for a modification permit for the Oak Grove Plant was received by this Division on January 15, 2015, and was assigned to Ed Andrews. The following item(s) were not included in the initial application submittal:

**Original affidavit for Class I legal advertisement not submitted:**  
***\*Legal ad must be republished to include the facility latitude & longitude***

**Application fee AND/OR additional application fees not included:**  
***\*\$1,000 Construction, Modification, Relocation or Temporary Permit***  
***\*\$1,000 NSPS***

***The submitted check #4000093892 in the amount of \$2,500 is being mailed back to the mailing address that is printed on the check, which is PO Box 21218, Tulsa, OK. It will be sent out today.***

***These items are necessary for the assigned permit writer to continue the 30-day completeness review.***

Within 30 days, you should receive a letter from Ed Andrews stating the status of the permit application and, if complete, given an estimated time frame for the agency's final action on the permit.

**NON-CONFIDENTIAL**

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, Ed Andrews, at 304-926-0499, extension 1214.

*Jennifer Rice*  
*WV Dept. of Environmental Protection*  
*Division of Air Quality*  
*304-926-0499 x1227*  
[Jennifer.L.Rice@wv.gov](mailto:Jennifer.L.Rice@wv.gov)