



550 N. 31st Street, Ste. 500
P.O. Box 7168
Billings, MT 59101



January 12, 2014

NSR Program Manager/Attn: O&G Production Facilities
Wyoming Department of Environmental Quality
Air Quality Division
Herschler Building 2-E
122 West 25th Street
Cheyenne, WY 82002

Dear Permit Engineer:

SM Energy Company respectfully submits the following permit application for its Flash State 4076-13-24-1FH and Razor State 4076-12-1-1FH facility.

The Flash State and Razor State are situated on the same pad. Treatment trains are separate except for a single tank vapor control device that is shared. The two electrical generator engines located on this facility have previously submitted waiver requests. All sources of emissions and control devices are accounted for in this application.

Please let me know if you have any questions or concerns.

Respectfully,

Luke Studer

SM Energy Company

Reviewer BMO
cc: _____
Modeler _____
D.E. _____
File A0000443
IMP FID ~~26625~~ 26625



Department of Environmental Quality Air Quality Division
Permit Application Form



Is this a revision to an existing application?
Yes _____ No X
Previous Application #:

Date of Application: 1/7/2015

COMPANY INFORMATION:

Company Name: SM Energy Co.
Address: 550 North 31st Street Suite 500
City: Billings State: Montana Zip Code: 59103
Country: USA Phone Number: 4068698706

FACILITY INFORMATION:

Facility Name: Flash State 4076-13-24-1FH and Razor State 4076-12-1-1FH Facility
New Facility or Existing Facility: New
Facility Description: Oil and Gas Production Facility
Facility Class: Minor Operating Status: Operating
Facility Type: Production Site

For Oil & Gas Production Sites ONLY:

First Date of Production (FDOP)/Date of Modification: 11/31/2014
Does production at this facility contain H2S?*: No

*If yes, contact the Division.

API Number(s): 49-009-28853 and 49-009-29095

NAICS Code: 211111 Crude Petroleum and Natural Gas Extraction

FACILITY LOCATION:

*Enter the facility location in either the latitude/longitude area or section/township/range area. Both are not required.

Physical Address:

City: Zip Code:
State: WY County:

OR

Latitude: 43.44467 Longitude: -105.93287 County: Converse
Quarter Quarter: NW Quarter: NW
Section: 13 Township: 40N Range: 76W

For longitude and latitude, use NAD 83/WGS84 datum and 5 digits after the decimal (i.e. 41.12345, -107.56789)

CONTACT INFORMATION:

*Note that an Environmental AND NSR Permitting Contact is required for your application to be deemed complete by the agency.

Title: Mr. First Name: Luke
Last Name: Studer
Company Name: SM Energy Co
Job Title: Regulatory & Safety Compliance Specialist
Address: 550 North 31st Street Suite 500
City: Billings State: Montana
Zip Code: 59103
Primary Phone No.: 406-869-8706 E-mail: lstuder@sm-energy.com
Mobile Phone No.: Fax No.:
Contact Type: Environmental contact Start Date:



Additional Contact Type (if needed): NSR Permitting contact
 Title: Ms. First Name: _____ Last Name: Lynn
 Last Name: Olson
 Company Name: Trihydro Co
 Job Title: Air Scientist
 Address: 28769 Edward View Drive
 City: Highland State: California
 Zip Code: 92346
 Primary Phone No.: (307) 633-9506 E-mail: lolson@trihydro.com
 Mobile Phone No.: _____ Fax No.: _____
 Contact Type: NSR Permitting contact Start Date: _____

FACILITY APPLICATION INFORMATION:

General Info:

Has the facility changed location or is it a new/ greenfield facility? Yes
 Has a Land Use Planning document been included in this application? No
 Is the facility located in a sage grouse core area? * No
 If the facility is in a sage grouse core area, what is the WER number? _____
 * For questions about sage grouse core area, contact WY Game & Fish Department.

Federal Rules Applicability - Facility Level:

Prevention of Significant Deterioration (PSD): No
 Non-Attainment New Source Review: No

Modeling Section:

Has the Air Quality Division been contacted to determine if modeling is required? No
 Is a modeling analysis part of this application? No
 Is the proposed project subject to Prevention of Significant Deterioration (PSD) requirements? No
 Has the Air Quality Division been notified to schedule a pre-application meeting? No
 Has a modeling protocol been submitted to and approved by the Air Quality Division? No
 Has the Air Quality Division received a Q/D analysis to submit to the respective FLMs to determine the need for an AQRV analysis? No

Required Attachments:

- Facility Map
- Process Flow Diagram
- Modeling Analysis (if applicable)
- Land Use Planning Document
- Detailed Project Description
- Emissions Calculations

I, Luke Studer _____
 Responsible Official (Printed Name) Regulatory & Safety Compliance Specialist
 Title

an Official Representative of the Company, state that I have knowledge of the facts herein set forth and that the same are true and correct to the best of my knowledge and belief. I further certify that the operational information provided and emission rates listed on this application reflect the anticipated emissions due to the operation of this facility. The facility will operate in compliance with all applicable Wyoming Air Quality Standards and Regulations.

Signature: 
 (ink)

Date: 1-9-15

Company Name

SM Energy

Facility Name

Flash State 4076-13-24-1FH and Razor State 4076-12-1-1FH Facility

Process Description

The Flash State and Razor State wells are co-located on the same well pad. The treatment trains are separate with the exception of sharing a single tank vapor control device. There are two electrical generator engines at this facility with previously submitted waiver requests.

The fluid streams containing natural gas, crude oil and produced water is routed to the vertical treater. The treater has a 0.75 MMBtu/hr heater. Three streams are generated in the treater including gas, oil, and water.

The crude oil stream is sent to one of the eight oil tanks associated with that specific well. The tank vapor emissions are captured and sent to the low pressure tip of the shared Steffes flare (on-site). The flare's combustion efficiency is estimated at 98 percent. The crude oil transfers custody at the on site LACT system and is sent offsite by pipeline.

The gas phase stream leaves the separator and is sent offsite to a pipeline owned by a third party. The stream is also used to fuel the vertical treaters' burner if additional fuel is needed. If the gas cannot be sent to the sales line, it will be sent to the high pressure tip of the Steffes flare (considered an emergency situation).

The water is sent to one of each wells two 400-barrel aboveground storage tanks and sent off site by truck. Since little water is produced and the water is from a treated stream, emissions are assumed to be minimal.

Fugitive emissions are associated with the valves, gauges, tank vents, hatches and connectors at the site. The components were estimated based on similar facilities. An exact component count was not performed.



STATE OF WYOMING
 Department of Environmental Quality - Air Quality Division
 Oil and Gas Production Facilities C6 S2 Permit Application



Equipment List

Company Name SM Energy
 Facility Name Flash State 4076-13-24-1FH and Razor State 4076-12-1-1FH Facility

List all production equipment at the site including all pressurized vessels with the potential for flash emissions, all hydrocarbon liquids and produced water storage tanks, all dehydration units, all pneumatic pumps, all natural gas-fired burners and heaters and all emission control equipment and devices. Pressurized vessels with the potential for flash emissions are all vessels that vent vapors to the atmosphere during times other than upset or emergency conditions (water knockouts, 2-phase and 3-phase separators, heater treaters, gun barrels, scrubber pots, etc). Provide design ratings for dehyds (MMCFD), process heaters, burners and pilots (MMBtu/hr, SCFH). Provide size of production & water storage tanks (BPD). For dehydration units indicate if the unit includes a glycol flash separator and/or reboiler still vent condenser. For emission control combustors/flares indicate design rating (MMBtu/hr, SCFD) and combustor/flare height (ft). Provide pneumatic pump motive gas usage (SCFH).

4 400-bbl water tank

16 400-bbl oil tanks (controlled by combustor)

2 6'x20' vertical treater with 0.75 MMBtu heater

2 small recycle pumps, less than 10 hp

1 Steffes combination flare with a low pressure tip for tank vapors and higher pressure for emergencies when produced gas cannot go to sales line

2 Natural gas-fired electrical generators (100 or 165 hp) - application submitted separately.

Specific Emission Unit Attributes:

Heater/Chiller

Company Equipment ID: Flash State Heater Treater heater
 Company Equipment Description: Heater Treater heater

Operating Status: Operating
 Initial Construction Commencement Date: October 2014
 Initial Operation Commencement Date: November 2014
 Most Recent Construction/ Modification Commencement Date: NA
 Most Recent Operation Commencement Date: NA

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Construction (Greenfield/New Facility)

If reason is *Reconstruction* or *Temporary Permit* or *Other*, please explain below:

Firing Type:	<u>Direct</u>			
Heat Input Rating:	<u>0.75</u>	Units:	<u>MMBtu/hr</u>	
Primary Fuel Type:	<u>Field Gas</u>			
Secondary Fuel Type:				
Heat Content of Fuel:	<u>1335</u>	Units:	<u>BTU/scf</u>	
Fuel Sulfur Content:	<u>0</u>	Units:	<u>ppm</u>	

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

2310010100

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day:	<u>24</u>
Hours/year:	<u>8760</u>

Control Equipment:

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed BACT: _____

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS):

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61):

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63):

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD):

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review:

These rules are found under WAQSR Chapter 6, Section 13.

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

		Efficiency Standards				
Pre-Controlled Potential Emissions (tons/yr)	Potential to Emit (PTE)	Units	Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination	
Criteria Pollutants:						
1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)					
2.)	PM #10 microns in diameter (PE/PM10)					
3.)	PM #2.5 microns in diameter (PE/PM2.5)					
4.)	Sulfur dioxide (SO2)	0.000588	lb/MMBtu	0.000	0.002	AP-42
5.)	Nitrogen Oxides (NOx)	0.098039	lb/MMBtu	0.074	0.322	AP-42
6.)	Carbon monoxide (CO)	0.082353	lb/MMBtu	0.062	0.271	AP-42
7.)	Volatile organic compounds (VOC)	0.005392	lb/MMBtu	0.004	0.018	AP-42
8.)	Lead (Pb)					
9.)	Total Hazardous Air Pollutants (HAPs)	See attached		0.001	0.006	AP-42
10.)	Fluoride (F)					
11.)	Hydrogen Sulfide (H2S)					
12.)	Mercury (Hg)					
13.)	Total Reduced Sulfur (TRS)					
14.)	Sulfuric Acid Mist (SAM)					

**Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.*

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminants

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

Pollutants:

1.)	See Attached					
2.)						
3.)						
4.)						
5.)						
6.)						
7.)						
8.)						

Greenhouse Gases (GHGs)

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

Pollutants:

1.)						
2.)						
3.)						
4.)						
5.)						
6.)						
7.)						
8.)						

Specific Emission Unit Attributes:

Heater/Chiller

Company Equipment ID: Razor State Heater Treater heater
Company Equipment Description: Heater Treater heater

Operating Status: Operating
Initial Construction Commencement Date: October 2014
Initial Operation Commencement Date: November 2014
Most Recent Construction/ Modification Commencement Date: NA

Most Recent Operation Commencement Date: NA

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Construction (Greenfield/New Facility)

If reason is Reconstruction or Temporary Permit or Other, please explain below:

Firing Type: Direct
Heat Input Rating: 0.75 Units: MMBtu/hr
Primary Fuel Type: Field Gas
Secondary Fuel Type:
Heat Content of Fuel: 1335 Units: BTU/scf
Fuel Sulfur Content: 0 Units: ppm

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

2310010100

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24
Hours/year: 8760

Control Equipment:

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed BACT: _____

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS):

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61):

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63):

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD):

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review:

These rules are found under WAQSR Chapter 6, Section 13.

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

Criteria Pollutants:

1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)					
2.)	PM #10 microns in diameter (PE/PM10)					
3.)	PM #2.5 microns in diameter (PE/PM2.5)					
4.)	Sulfur dioxide (SO2)	0.000588	lb/MMBtu	0.000	0.002	AP-42
5.)	Nitrogen Oxides (NOx)	0.098039	lb/MMBtu	0.074	0.322	AP-42
6.)	Carbon monoxide (CO)	0.082353	lb/MMBtu	0.062	0.271	AP-42
7.)	Volatile organic compounds (VOC)	0.005392	lb/MMBtu	0.004	0.018	AP-42
8.)	Lead (Pb)					
9.)	Total Hazardous Air Pollutants (HAPs)	See attached		0.001	0.006	AP-42
10.)	Fluoride (F)					
11.)	Hydrogen Sulfide (H2S)					
12.)	Mercury (Hg)					
13.)	Total Reduced Sulfur (TRS)					
14.)	Sulfuric Acid Mist (SAM)					

**Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.*

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminants

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

Pollutants:

1.)	See Attached					
2.)						
3.)						
4.)						
5.)						
6.)						
7.)						
8.)						

Greenhouse Gases (GHGs)

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

Pollutants:

1.)						
2.)						
3.)						
4.)						
5.)						
6.)						
7.)						
8.)						

Specific Emission Unit Attributes:

Separator/Treater

Company Equipment ID: Flash State Heater Treater
Company Equipment Description: Heater Treater

Operating Status:
Initial Construction Commencement Date: October 2014
Initial Operation Commencement Date: November 2014
Most Recent Construction/ Modification Commencement Date: NA

Most Recent Operation Commencement Date: NA

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason:

If reason is *Reconstruction* or *Temporary Permit* or *Other*, please explain below:

Type of Vessel: Is Vessel Heated?
Operating Temperature (F): 80-145
Operating Pressure (psig): 30-75

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

31000129

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24
Hours/year: 8760

Control Equipment: Yes No

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed BACT: Presumptive BACT- Smokeless Combustor 98% control, but all gas is typically sold

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): Not Affected

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): Not Affected

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): Not Affected

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: Not Affected

These rules are found under WAQSR Chapter 6, Section 13.

Specific Emission Unit Attributes:

Separator/Treater

Company Equipment ID: Razor State Heater Treater
Company Equipment Description: Heater Treater

Operating Status: Operating
Initial Construction Commencement Date: October 2014
Initial Operation Commencement Date: November 2014
Most Recent Construction/ Modification Commencement Date: NA

Most Recent Operation Commencement Date: NA

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Construction (Greenfield/New Facility)

If reason is Reconstruction or Temporary Permit or Other, please explain below:

Type of Vessel: Heater-Treater Is Vessel Heated? Yes
Operating Temperature (F): 80-145
Operating Pressure (psig): 30-75

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

31000129

Potential Operating Schedule: Provide the operating schedule for this emission unit.
Hours/day: 24
Hours/year: 8760

Control Equipment: Yes No

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed BACT: Presumptive BACT- Smokeless Combustor 98% control, but all gas is typically sold

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): Not Affected

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): Not Affected

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): Not Affected

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: Not Affected

These rules are found under WAQSR Chapter 6, Section 13.

Specific Emission Unit Attributes:

Storage Tank/Silo

Company Equipment ID: Flash State Oil Tanks 1-8
Company Equipment Description: Flash Crude 1-8

Operating Status: Operating
Initial Construction Commencement Date: June-Oct 2014
Initial Operation Commencement Date: October 2014
Most Recent Construction/ Modification Commencement Date: NA

Most Recent Operation Commencement Date: NA

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Construction (Greenfield/New Facility)

If reason is Reconstruction or Temporary Permit or Other, please explain below:

Material Type: Liquid
Description of Material Stored: Crude Oil from Oil well production

Capacity: 400 Units: barrels
Maximum Throughput: 421 Units: barrels/day
Maximum Hourly Throughput: NA Units:
Operating Pressure (psig): Atmosphere
Vapor Pressure of Material Stored (psig): RVP 7
Is Tank Heated?: No

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

2310010200

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24
Hours/year: 8760

Control Equipment:

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed BACT: 98% combustor

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS):

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61):

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63):

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD):

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review:

These rules are found under WAQSR Chapter 6, Section 13.

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

Criteria Pollutants:

1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)						
2.)	PM #10 microns in diameter (PE/PM10)						
3.)	PM #2.5 microns in diameter (PE/PM2.5)						
4.)	Sulfur dioxide (SO2)						
5.)	Nitrogen Oxides (NOx)		0.14	lb/MMBtu	0.11	0.47	AP-42
6.)	Carbon monoxide (CO)		0.37	lb/MMBtu	0.29	1.25	AP-42
7.)	Volatile organic compounds (VOC)	104.94			0.48	2.10	Other
8.)	Lead (Pb)						
9.)	Total Hazardous Air Pollutants (HAPs)	2.60			0.01	0.05	Other
10.)	Fluoride (F)						
11.)	Hydrogen Sulfide (H2S)						
12.)	Mercury (Hg)						
13.)	Total Reduced Sulfur (TRS)						
14.)	Sulfuric Acid Mist (SAM)						

**Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.*

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminants

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

Pollutants:

1.)					
2.)					
3.)					
4.)					
5.)					
6.)					
7.)					
8.)					

Greenhouse Gases (GHGs)

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

Pollutants:

1.)					
2.)					
3.)					
4.)					
5.)					
6.)					
7.)					
8.)					

Specific Emission Unit Attributes:

Storage Tank/Silo

Company Equipment ID: Razor State Oil Tanks 1-8
Company Equipment Description: Flash Crude 1-8

Operating Status: Operating
Initial Construction Commencement Date: June-Oct 2014
Initial Operation Commencement Date: October 2014
Most Recent Construction/ Modification Commencement Date: NA

Most Recent Operation Commencement Date: NA

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Construction (Greenfield/New Facility)

If reason is Reconstruction or Temporary Permit or Other, please explain below:

Material Type: Liquid
Description of Material Stored: Crude Oil from Oil well production

Capacity: 400 Units: barrels
Maximum Throughput: 662 Units: barrels/day
Maximum Hourly Throughput: NA Units:
Operating Pressure (psig): Atmosphere
Vapor Pressure of Material Stored (psig): RVP 7
Is Tank Heated?: No

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

2310010200

Potential Operating Schedule: Provide the operating schedule for this emission unit.
Hours/day: 24
Hours/year: 8760

Control Equipment:

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed BACT: 98% combustor

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS):

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61):

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63):

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD):

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review:

These rules are found under WAQSR Chapter 6, Section 13.

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

Criteria Pollutants:

1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)					
2.)	PM #10 microns in diameter (PE/PM10)					
3.)	PM #2.5 microns in diameter (PE/PM2.5)					
4.)	Sulfur dioxide (SO2)					
5.)	Nitrogen Oxides (NOx)		0.14	lb/MMBtu	0.17	0.75
6.)	Carbon monoxide (CO)		0.37	lb/MMBtu	0.45	1.97
7.)	Volatile organic compounds (VOC)	104.94			0.74	3.22
8.)	Lead (Pb)					
9.)	Total Hazardous Air Pollutants (HAPs)	2.60			0.02	0.08
10.)	Fluoride (F)					
11.)	Hydrogen Sulfide (H2S)					
12.)	Mercury (Hg)					
13.)	Total Reduced Sulfur (TRS)					
14.)	Sulfuric Acid Mist (SAM)					

**Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.*

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminants

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

Pollutants:

1.)					
2.)					
3.)					
4.)					
5.)					
6.)					
7.)					
8.)					

Greenhouse Gases (GHGs)

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

Pollutants:

1.)					
2.)					
3.)					
4.)					
5.)					
6.)					
7.)					
8.)					

Specific Emission Unit Attributes:

Storage Tank/Silo

Company Equipment ID: Flash/Razor Produced Water Tanks
 Company Equipment Description: Produced Water 1-4

Operating Status: Operating
 Initial Construction Commencement Date: June-Oct 2014
 Initial Operation Commencement Date: 10/15/2014
 Most Recent Construction/ Modification Commencement Date: NA

Most Recent Operation Commencement Date: NA

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Construction (Greenfield/New Facility)

If reason is *Reconstruction* or *Temporary Permit* or *Other*, please explain below:

Material Type: Liquid
 Description of Material Stored: Produced water from Oil well production

Capacity: 400 Units: barrels
 Maximum Throughput: 855 Units: barrels/day
 Maximum Hourly Throughput: NA Units:
 Operating Pressure (psig): Atmosphere
 Vapor Pressure of Material Stored (psig): 1 (water)
 Is Tank Heated?: No

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

2310010200

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24
 Hours/year: 8760

Control Equipment: Yes No

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed BACT: _____

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): Not Affected

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): Not Affected

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): Not Affected

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: Not Affected

These rules are found under WAQSR Chapter 6, Section 13.

Control Equipment:

Flare/Combustor

Manufacturer: Steffes Dual Tip Flare Date Installed: June-Oct 2014
 Model Name and Number: _____ Company Control _____
 Company Control Equipment: _____ Equipment ID: _____
 Description: Flash/Razor tank vapor and emergency gas flare Flash/Razor Flare

Pollutant(s) Controlled:					
<input type="checkbox"/> CO	<input type="checkbox"/> NOx	<input type="checkbox"/> Pb	<input type="checkbox"/> SO2	<input checked="" type="checkbox"/> VOC	<input type="checkbox"/> PM
<input type="checkbox"/> PM (FIL)	<input type="checkbox"/> PM Condensable	<input type="checkbox"/> PM 10 (FIL)	<input type="checkbox"/> PM 2.5 (FIL)	<input type="checkbox"/> PM 10	<input type="checkbox"/> PM 2.5
<input checked="" type="checkbox"/> Other					

NOTE: The following fields require numeric values unless otherwise denoted with an asterisk*

Maximum Design Capacity (MMSCF/hr): _____
 Minimum Design Capacity (MMSCF/hr): _____
 Design Control Efficiency (%): 98 Capture Efficiency (%): _____
 Operating Control Efficiency (%): 98
 Flare Type:* Enclosed Elevated Flare Type:* Non-Assisted
 Ignition Device:* Yes Flame Presence Sensor:* Yes
 Inlet Gas Temp (F): ambient at 90F Flame Presence Type:* Other
 Gas Flow Rate (acfm): _____ Outlet Gas Temp (F): _____
 This is the only control equipment on this air contaminant source
 If not, this control equipment is: Primary Secondary Parallel

List all other emission units that are also vented to this control equipment:* _____
 List all release point IDs associated with this control equipment:* This Flare controls tank vapors, and in emergency situations when associated gas can not be sold (or consumed by the treater heater). Tanks & Heater Treater (in emergencies)

Specific Emission Unit Attributes:

Fugitives

Company Equipment ID: Razor/Flash Fugs

Company Equipment Description: Fugitive Emissions

Operating Status: Operating

Initial Construction Commencement Date: June-Oct 2014

Initial Operation Commencement Date: 10/15/2014

Most Recent Construction/ Modification Commencement Date: NA

Most Recent Operation Commencement Date: NA

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Construction (Greenfield/New Facility)

If reason is *Reconstruction* or *Temporary Permit* or *Other*, please explain below:

Type of Fugitive Emission: Fugitive Leaks at O&G

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

31088811

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24

Hours/year: 8760

Control Equipment:

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed BACT: _____

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS):

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61):

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63):

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD):

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review:

These rules are found under WAQSR Chapter 6, Section 13.

Emissions Information- The following tables request information needed to determine the applicable requirements and the compliance status of this emission unit with those requirements.

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

Criteria Pollutants:

1.)	Particulate emissions (PE/PM) (formerly particulate matter, PM)					
2.)	PM #10 microns in diameter (PE/PM10)					
3.)	PM #2.5 microns in diameter (PE/PM2.5)					
4.)	Sulfur dioxide (SO2)					
5.)	Nitrogen Oxides (NOx)					
6.)	Carbon monoxide (CO)					
7.)	Volatile organic compounds (VOC)			1.00	1.91	Other
8.)	Lead (Pb)					
9.)	Total Hazardous Air Pollutants (HAPs)			0.07	0.32	Other
10.)	Fluoride (F)					
11.)	Hydrogen Sulfide (H2S)					
12.)	Mercury (Hg)					
13.)	Total Reduced Sulfur (TRS)					
14.)	Sulfuric Acid Mist (SAM)					

**Provide your calculations as an attachment and explain how all process variables and emissions factors were selected.*

Hazardous Air Pollutants (HAPs) and Toxic Air Contaminants

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

Pollutants:

1.)					
2.)					
3.)					
4.)					
5.)					
6.)					
7.)					
8.)					

Greenhouse Gases (GHGs)

Pre-Controlled Potential Emissions (tons/yr)	Efficiency Standards		Potential to Emit (lbs/hr)	Potential to Emit (tons/yr)	Basis for Determination
	Potential to Emit (PTE)	Units			

Pollutants:

1.)					
2.)					
3.)					
4.)					
5.)					
6.)					
7.)					
8.)					

Release Point Information:

Complete the table below for *each* release point. Please include release point information for each emission unit. Multiple attachments may be necessary. A release point is a point at which emissions from an emission unit are released into the ambient (outside)air. List each individual release point on a separate pair of lines (release point ID and description). *For longitude and latitude, use NAD 83/WGS84 datum and 5 digits after the decimal (i.e. 41.12345, -107.56789)*

Stack Release Point Information	
Company Release Point ID:	Release Point Type: <input type="text" value="Vertical"/>
Controlled Tank & Emergency gas Emissions	Release Point Latitude: <u>43.44467</u>
	Release Point Longitude: <u>-105.93287</u>
Company Release Point Description:	Base Elevation (ft): <u>5241</u>
Tank vapor and Associated gas combustor emissions	Stack Height (ft): <u>20</u>
	Stack Diameter (ft): <u>1.54</u>
	Exit Gas Velocity (ft/s): _____
	Exit Gas Temp (F): _____
	Exit Gas Flow Rate (acfm): _____
Company Release Point ID:	Release Point Type: <input type="text" value="Vertical"/>
Flash Heater Treater heater	Release Point Latitude: <u>43.44467</u>
	Release Point Longitude: <u>-105.93287</u>
Company Release Point Description:	Base Elevation (ft): <u>5241</u>
	Stack Height (ft): <u>20</u>
	Stack Diameter (ft): <u>0.25</u>
	Exit Gas Velocity (ft/s): _____
	Exit Gas Temp (F): _____
	Exit Gas Flow Rate (acfm): _____
Company Release Point ID:	Release Point Type: <input type="text" value="Vertical"/>
Razor Heater Treater heater	Release Point Latitude: <u>43.44467</u>
	Release Point Longitude: <u>-105.93287</u>
Company Release Point Description:	Base Elevation (ft): <u>5241</u>
	Stack Height (ft): <u>20</u>
	Stack Diameter (ft): <u>0.25</u>
	Exit Gas Velocity (ft/s): _____
	Exit Gas Temp (F): _____
	Exit Gas Flow Rate (acfm): _____
Company Release Point ID:	Release Point Type: <input type="text"/>
	Release Point Latitude: _____
	Release Point Longitude: _____
Company Release Point Description:	Base Elevation (ft): _____
	Stack Height (ft): _____
	Stack Diameter (ft): _____
	Exit Gas Velocity (ft/s): _____
	Exit Gas Temp (F): _____
	Exit Gas Flow Rate (acfm): _____

Complete the table below for each fugitive (area, volume, line) release point. List each individual release point on a separate line.

Fugitive Release Point Information	
Company Release Point ID:	Release Point Latitude: <u>43.44467</u>
Fugs	Release Point Longitude: <u>-105.93287</u>
Company Release Point Description:	Release Height (ft): <u>between 1 and 30</u>
Fugitives, which by definition do not have a point, volume or line	
Company Release Point ID:	Release Point Latitude: _____
	Release Point Longitude: _____
Company Release Point Description:	Release Height (ft): _____
Company Release Point ID:	Release Point Latitude: _____
	Release Point Longitude: _____
Company Release Point Description:	Release Height (ft): _____
Company Release Point ID:	Release Point Latitude: _____
	Release Point Longitude: _____
Company Release Point Description:	Release Height (ft): _____

**SM ENERGY, FLASH RAZOR
COMBUSTION EMISSIONS**

Compound	Emission Factor (lb/10 ⁶ ft ³)	Emission Factor (lb/MMBtu)	Treaters - 0.75 MMBtu/hr PTE (TPY)	Emission Factor Source
CO	84	0.082352941	0.271	AP-42 Table 1.4-1
NO _x	100	0.098039216	0.322	AP-42 Table 1.4-1
SO ₂	0.6	0.000588235	0.002	AP-42 Table 1.4-2
VOC	5.5	0.005392157	0.018	AP-42 Table 1.4-2
Total HAPs	--	--	0.006	--
2-Methylnaphthalene	2.4E-05	2.4E-08	7.7E-08	AP-42 Table 1.4-3
3-Methylchloranthrene	1.8E-06	1.8E-09	5.8E-09	AP-42 Table 1.4-3
7,12-Dimethylbenz(a)anthracene	1.6E-05	1.6E-08	5.2E-08	AP-42 Table 1.4-3
Acenaphthene	1.8E-06	1.8E-09	5.8E-09	AP-42 Table 1.4-3
Acenaphthylene	1.8E-06	1.8E-09	5.8E-09	AP-42 Table 1.4-3
Anthracene	2.4E-06	2.4E-09	7.7E-09	AP-42 Table 1.4-3
Benz(a)anthracene	1.8E-06	1.8E-09	5.8E-09	AP-42 Table 1.4-3
Benzene	2.1E-03	2.1E-06	6.8E-06	AP-42 Table 1.4-3
Benzo(a)pyrene	1.2E-06	1.2E-09	3.9E-09	AP-42 Table 1.4-3
Benzo(b)fluoranthene	1.8E-06	1.8E-09	5.8E-09	AP-42 Table 1.4-3
Benzo(g,h,i)perylene	1.2E-06	1.2E-09	3.9E-09	AP-42 Table 1.4-3
Benzo(k)fluoranthene	1.8E-06	1.8E-09	5.8E-09	AP-42 Table 1.4-3
Chrysene	1.8E-06	1.8E-09	5.8E-09	AP-42 Table 1.4-3
Dibenzo(a,h)anthracene	1.2E-06	1.2E-09	3.9E-09	AP-42 Table 1.4-3
Dichlorobenzene	1.2E-03	1.2E-06	3.9E-06	AP-42 Table 1.4-3
Fluoranthene	3.0E-06	2.9E-09	9.7E-09	AP-42 Table 1.4-3
Fluorene	2.8E-06	2.7E-09	9.0E-09	AP-42 Table 1.4-3
Formaldehyde	7.5E-02	7.4E-05	2.4E-04	AP-42 Table 1.4-3
Hexane	1.8E+00	1.8E-03	5.8E-03	AP-42 Table 1.4-3
Indeno(1,2,3-cd)pyrene	1.8E-06	1.8E-09	5.8E-09	AP-42 Table 1.4-3
Naphthalene	6.1E-04	6.0E-07	2.0E-06	AP-42 Table 1.4-3
Phenanthrene	1.7E-05	1.7E-08	5.5E-08	AP-42 Table 1.4-3
Pyrene	5.0E-06	4.9E-09	1.6E-08	AP-42 Table 1.4-3
Toluene	3.4E-03	3.3E-06	1.1E-05	AP-42 Table 1.4-3
Arsenic	2.0E-04	2.0E-07	6.4E-07	AP-42 Table 1.4-4
Beryllium	1.2E-05	1.2E-08	3.9E-08	AP-42 Table 1.4-4
Cadmium	1.1E-03	1.1E-06	3.5E-06	AP-42 Table 1.4-4
Chromium	1.4E-03	1.4E-06	4.5E-06	AP-42 Table 1.4-4
Cobalt	8.4E-05	8.2E-08	2.7E-07	AP-42 Table 1.4-4
Manganese	3.8E-04	3.7E-07	1.2E-06	AP-42 Table 1.4-4
Mercury	2.6E-04	2.5E-07	8.4E-07	AP-42 Table 1.4-4
Nickel	2.1E-03	2.1E-06	6.8E-06	AP-42 Table 1.4-4
Selenium	2.4E-05	2.4E-08	7.7E-08	AP-42 Table 1.4-4

SM ENERGY FLASH/RAZOR
FUGITIVE EMISSIONS

Component Source Counts					
Equipment Type	Storage Tank	Wellhead	Separator	Heater-treater	Header
Number of units	20	2	0	2	2
Valves	6	5	6	8	5
Flanges	4	10	12	12	10
Connectors	20	4	10	20	4
Open-ended lines	2	0	0	0	0
Other components	2	1	0	0	0

Emissions				
Total Component Count	Hydrocarbon EF (lb/component-day)	TPY HC	HC VOC Wt. Fraction	TPY VOCs
Valves	156	3.70	1	3.70
Flanges	144	0.15	1	0.15
Connectors	456	0.92	1	0.92
Open-ended lines	40	0.54	1	0.54
Other components	42	3.07	1	3.07
Total	838	8.38		8.38

Total HCs = 8.38 TPY
 Total VOC's = 8.38 TPY
 Total VOC's = 1.91 lb/hr
 Total HAPs = 0.32 TPY
 Total HAPs = 0.07 lb/hr

- Component counts were derived from Table W-1C of Subpart W (Oil and Natural Gas Systems) of 40 CFR Part 98 for Western U.S. oil production equipment for wellheads and heater treater. Tank components are based on engineering estimates.
- Emission Factors (in lb/component-day) from Wyoming Air Quality Division Oil and Gas Permitting Guidance, 2007
- Light Oil VOC Weight fraction assumed to be 1.0 to be conservative
- To be conservative, all Speciated Fugitive Emission Factors (Wt Fractions) from light crude - Wyoming Air Quality Division Oil and Gas Permitting Guidance, 2007 (HAP Fraction of Hydrocarbon Emissions 0.2585)
- Total HAPs calculated by multiplying Total HCs in TPY by weight fraction HAPs

**SM ENERGY FLASH/RAZOR
CONTROLLED TANK EMISSIONS**

CO and NOx Emissions From Combustion of Tank Vapors				
Flash State				
Compound	Emission Factor (lb/MMBtu)	Throughput MMBtu/yr	Controlled Emissions (TPY)	Emission Factor Source
CO	0.37	6,773	1.253	AP-42 Table 13.5-1
NO _x	0.14	6,773	0.474	AP-42 Table 13.5-1

HC Vapor emissions (MSCFD) = 13.3600
 Gas Heat Content (Btu/SCF) = 1,389.00
 Annual heat throughput (Btu/yr) = 6,773,319,600

* Both the throughput and heat content are from the Promax modeling results - attached.

VOC and HAPs Emissions From Combustion of Tank Vapors				
Compound	Throughput (TPY)	Burner Control Efficiency (%)	Controlled Emissions (TPY)	Emission Factor Source
VOC	105.00	98	2.100	WY Oil and Gas Guidance -2010
HAPs	2.60	98	0.052	WY Oil and Gas Guidance -2010

Emissions are based on 98% control efficiency.

Production values put in E&P Tanks is incorporating a decline factor of 40% to account for the decrease in production during the first year

Razor State				
Compound	Emission Factor (lb/MMBtu)	Throughput MMBtu/yr	Controlled Emissions (TPY)	Emission Factor Source
CO	0.37	10,647	1.970	AP-42 Table 13.5-1
NO _x	0.14	10,647	0.745	AP-42 Table 13.5-1

HC Vapor emissions (MSCFD) = 21.0000
 Gas Heat Content (Btu/SCF) = 1,389.00
 Annual heat throughput (Btu/yr) = 10,646,685,000

* Both the throughput and heat content are from the Promax modeling results - attached.

VOC and HAPs Emissions From Combustion of Tank Vapors				
Compound	Throughput* (TPY)	Burner Control Efficiency (%)	Controlled Emissions (TPY)	Emission Factor Source
VOC	161.10	98	3.222	WY Oil and Gas Guidance -2010
HAPs	4.05	98	0.081	WY Oil and Gas Guidance -2010

Emissions are based on 98% control efficiency.

Production values put in E&P Tanks is incorporating a decline factor of 40% to account for the decrease in production during the first year

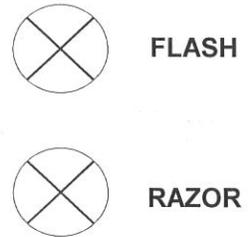
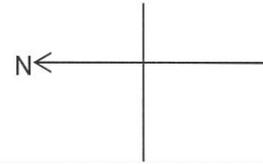
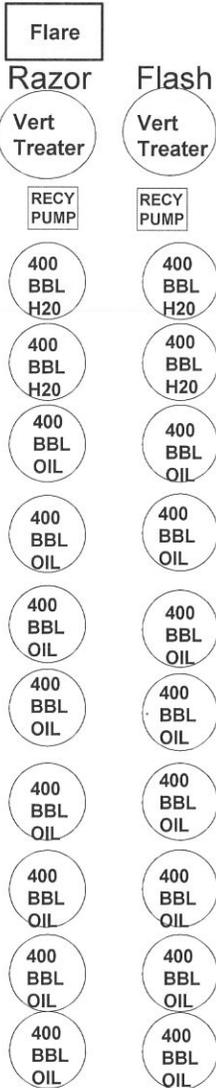
**SM ENERGY CO.
SITE SECURITY DIAGRAM:**

WELL NO: FLASH STATE 4076-13-24-1FH
 RAZOR STATE 4076-12-1-1FH
 STATE NO: ST 10-00848
 FIELD NAME: FINLEY DRAW FIELD
 LOCATION: FLASH-NWNW SEC 13-T40N-R76W
 RAZOR-NWNW SEC 13-T40N-R76W
 COUNTY: CONVERSE STATE: WY

SITE FACILITY PLAN LOCATED AT:
 SM ENERGY CO
 550 N 31ST ST, SUITE 500
 BILLINGS, MT 59103

VALVE SEALING DETAIL	PRODUCTION OR NORMAL OPERATIONS	RECYCLING	SALES
C=RECYCLING	O/C	O	SC
E=EQUALIZER	O/C	O/C	SC
F=PRODUCTION	O	O/C	SC
I=INJECTION	SC	SC	O

WHERE: O – OPEN, SO – SEALED OPEN,
 C – CLOSED, SC – SEALED CLOSED,
 O/C – OPEN OR SEALED



Entrance

Process Streams

Flash State Flash State Oil Flash State Tank Vapor Razor Razor Oil Razor Tank Vapor

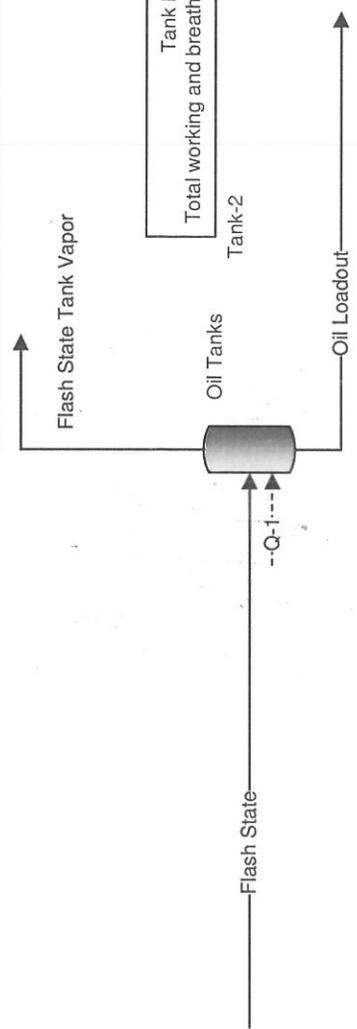
Properties	Status:	Solved		Solved		Solved		Solved		Solved	
		From Block:	Oil Tanks	Oil Tanks	Oil Tanks	Oil Tanks	VSSL-100	VSSL-100	VSSL-100	VSSL-100	
Phase: Total	To Block:	Oil Tanks		Oil Tanks		Oil Tanks		Oil Tanks		Oil Tanks	
Property	Units	128*		60*		128		60*		60	
Temperature	°F	128*	60*	60*	128	74	74	60*	60	60	60
Pressure	psig	74*	0*	0	100	0	1,88901	0	100	0	100
Mole Fraction Vapor	%	1,88901	0	100	0	0	1,88901	0	100	0	100
Mole Fraction Light Liquid	%	98.1110	100	0	0	0	98.1110	100	0	0	0
Mole Fraction Heavy Liquid	%	0	0	0	0	0	0	0	0	0	0
Molecular Weight	lb/lbmol	174.244	182.144	29.0131	0.0770489	174.244	182.144	182.144	29.0131	0.0770489	29.0131
Mass Density	lb/ft³	35.3777	50.0742	0.0770489	1.46683	35.3777	50.0742	50.0742	0.0770489	2.30572	0.0770489
Molar Flow	lbmol/h	28.4239	26.9576	1.46683	42.5428	44.6951	44.6951	42.3894	2.30572	2.30572	2.30572
Mass Flow	lb/h	4952.70	4910.16	42.5428	552.153	7787.86	7787.86	7720.96	66.8963	66.8963	66.8963
Vapor Volumetric Flow	ft³/h	17.4539	98.0575	68.8399	552.153	220.135	27.4454	154.190	868.232	868.232	868.232
Liquid Volumetric Flow	gpm	12.2254	12.2254	68.8399	552.153	220.135	27.4454	154.190	108.247	108.247	108.247
Std Vapor Volumetric Flow	MMSCFD	0.258875	0.245520	0.0133548	0.206932	0.407067	0.407067	0.386067	0.0209997	0.0209997	0.0209997
Std Liquid Volumetric Flow	sgpm	12.4861	12.2792*	0.206932	0.992280	19.6337	19.6337	19.3083*	0.325389	0.325389	0.325389
Compressibility		0.0692683	0.00958530	0.992280	0.992280	0.0692683	0.0692683	0.00958530	0.992280	0.992280	0.992280
Specific Gravity		0.802871	0.802871	1.00174	1.00174	0.802871	0.802871	0.802871	1.00174	1.00174	1.00174
API Gravity		44.7426	44.7426	44.7426	44.7426	44.7426	44.7426	44.7426	44.7426	44.7426	44.7426
Enthalpy	Btu/h	-3.95785E+06	-4.05925E+06	-57118.4	-6.22351E+06	-6.38295E+06	-6.38295E+06	-89815.7	-89815.7	-89815.7	-89815.7
Mass Enthalpy	Btu/lb	-799.130	-826.704	-1342.61	-799.130	-826.704	-799.130	-1342.61	-1342.61	-1342.61	-1342.61
Mass Cp	Btu/(lb*°F)	0.500288	0.459845	0.431754	0.500288	0.459845	0.500288	0.431754	0.431754	0.431754	0.431754
Ideal Gas CpCv Ratio	cP	1.02903	1.03108	1.18958	1.02903	1.03108	1.02903	1.18958	1.18958	1.18958	1.18958
Dynamic Viscosity	cP	2.19836	2.19836	0.00945430	2.19836	2.19836	2.19836	2.19836	0.00945430	0.00945430	0.00945430
Kinematic Viscosity	cSt	2.74071	2.74071	7.66024	2.74071	2.74071	2.74071	7.66024	7.66024	7.66024	7.66024
Thermal Conductivity	Btu/(h*ft*°F)	0.0722545	0.0722545	0.0140673	0.0722545	0.0722545	0.0722545	0.0140673	0.0140673	0.0140673	0.0140673
Surface Tension	lb/ft	0.00204503?	0.00204503?	0.00204503?	0.00204503?	0.00204503?	0.00204503?	0.00204503?	0.00204503?	0.00204503?	0.00204503?
Net Ideal Gas Heating Value	Btu/ft³	8600.11	8984.54	1532.63	8600.11	8984.54	8600.11	8984.54	1532.63	1532.63	1532.63
Net Liquid Heating Value	Btu/lb	18575.9	18564.1	19936.9	18575.9	18564.1	18575.9	18564.1	19936.9	19936.9	19936.9
Gross Ideal Gas Heating Value	Btu/ft³	9185.21	9593.60	1677.14	9185.21	9593.60	9185.21	9593.60	1677.14	1677.14	1677.14
Gross Liquid Heating Value	Btu/lb	19850.2	19833.1	21827.0	19850.2	19833.1	19850.2	19833.1	21827.0	21827.0	21827.0

Process Streams		Flash State	Flash State	Oil	Flash State	Tank Vapor	Razor	Razor Oil	Razor Tank Vapor
Composition	Status:	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved
Phase: Vapor	From Block:	Oil Tanks	Oil Tanks	Oil Tanks	Oil Tanks	VSSL-100	VSSL-100	VSSL-100	VSSL-100
Mass Flow	To Block:	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h
Hydrogen Sulfide		0			0	0	0		0
Oxygen		0			0	0	0		0
Carbon Dioxide		0.124849			0.467722	0.196319	0.735468		0
Nitrogen		0.172212			0.247876	0.270793	0.389772		0.389772
Methane		6.17961			12.5062	9.71710	19.6654		19.6654
Ethane		1.96118			8.15061	3.08385	12.8164		12.8164
Propane		1.80707			9.93893	2.84152	15.6284		15.6284
Isobutane		0.275331			1.50496	0.432943	2.36647		2.36647
n-Butane		0.826575			4.35886	1.29975	6.85407		6.85407
Isopentane		0.293955			1.34512	0.462229	2.11513		2.11513
n-Pentane		0.636137			2.75015	1.00029	4.32446		4.32446
Hexane		0.121278			0.413745	0.190703	0.650592		0.650592
Heptane		0.152799			0.409904	0.240269	0.644552		0.644552
Octane		0.0781779			0.163846	0.122931	0.257639		0.257639
Nonane		0.0156494			0.0260498	0.0246079	0.0409620		0.0409620
Benzene		0.0104630			0.0374537	0.0164525	0.0588939		0.0588939
Toluene		0.0345680			0.0957247	0.0543563	0.150522		0.150522
Ethylbenzene		0.00827766			0.0182454	0.0130162	0.0286899		0.0286899
m-Xylene		0.00124481			0.00261302	0.00195740	0.00410883		0.00410883
p-Xylene		0.00797255			0.0169120	0.0125364	0.0265932		0.0265932
o-Xylene		0.00166707			0.00347431	0.00262138	0.00546316		0.00546316
2,2,4-Trimethylpentane		0.0297037			0.0843076	0.0467074	0.132569		0.132569
C10+		0.000235075			5.69812E-05	0.000369644	8.95999E-05		8.95999E-05

Process Streams		Flash State Oil		Flash State Tank Vapor		Razor		Razor Oil		Razor Tank Vapor	
Properties	Status:	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	
Phase: Vapor	From Block:	Oil Tanks	Oil Tanks	Oil Tanks	VSSL-100	VSSL-100	VSSL-100	VSSL-100	VSSL-100	VSSL-100	
Property	To Block:	Oil Tanks	Oil Tanks	Oil Tanks	VSSL-100	VSSL-100	VSSL-100	VSSL-100	VSSL-100	VSSL-100	
	Units										
Temperature	°F	128		60	128		60		128	60	
Pressure	psig	74		0	74		0		74	0	
Mole Fraction Vapor	%	100		100	100		100		100	100	
Mole Fraction Light Liquid	%	0		0	0		0		0	0	
Mole Fraction Heavy Liquid	%	0		0	0		0		0	0	
Molecular Weight	lb/lbmol	23.7255		29.0131	23.7255		29.0131		23.7255	29.0131	
Mass Density	lb/ft³	0.340752		0.0770489	0.340752		0.0770489		0.340752	0.0770489	
Molar Flow	lbmol/h	0.536930		1.46653	0.844294		2.30572		0.536930	2.30572	
Mass Flow	lb/h	12.7390		42.5428	20.0313		66.8963		12.7390	66.8963	
Vapor Volumetric Flow	ft³/h	37.3848		552.153	58.7856		868.232		37.3848	868.232	
Liquid Volumetric Flow	gpm	4.66096		68.8399	7.32911		108.247		4.66096	108.247	
Std Vapor Volumetric Flow	MMSCFD	0.00489016		0.0133548	0.00768951		0.0209997		0.00489016	0.0209997	
Std Liquid Volumetric Flow	sgpm	0.0681249		0.206932	0.107123		0.325389		0.0681249	0.325389	
Compressibility		0.979227		0.992280	0.979227		0.992280		0.979227	0.992280	
Specific Gravity		0.819179		1.00174	0.819179		1.00174		0.819179	1.00174	
API Gravity											
Enthalpy	Btu/h	-18946.6		-57118.4	-29792.5		-89815.7		-18946.6	-89815.7	
Mass Enthalpy	Btu/lb	-1487.30		-1342.61	-1487.30		-1342.61		-1487.30	-1342.61	
Mass Cp	Btu/(lb*°F)	0.493940		0.431754	0.493940		0.431754		0.493940	0.431754	
Ideal Gas CpCv Ratio	CP	1.20884		1.18958	1.20884		1.18958		1.20884	1.18958	
Dynamic Viscosity	cSt	0.0112949		0.00945430	0.0112949		0.00945430		0.0112949	0.00945430	
Kinematic Viscosity	Btu/(h*ft*°F)	2.06930		7.66024	2.06930		7.66024		2.06930	7.66024	
Thermal Conductivity	Btu/ft	0.0188521		0.0140673	0.0188521		0.0140673		0.0188521	0.0140673	
Surface Tension	Btu/ft³	1264.20		1532.63	1264.20		1532.63		1264.20	1532.63	
Net Ideal Gas Heating Value	Btu/lb	20142.5		19936.9	20142.5		19936.9		20142.5	19936.9	
Net Liquid Heating Value	Btu/ft³	1389.39		1677.14	1389.39		1677.14		1389.39	1677.14	
Gross Ideal Gas Heating Value	Btu/lb	22144.9		21827.0	22144.9		21827.0		22144.9	21827.0	
Gross Liquid Heating Value	Btu/ft³	22144.9		21827.0	22144.9		21827.0		22144.9	21827.0	

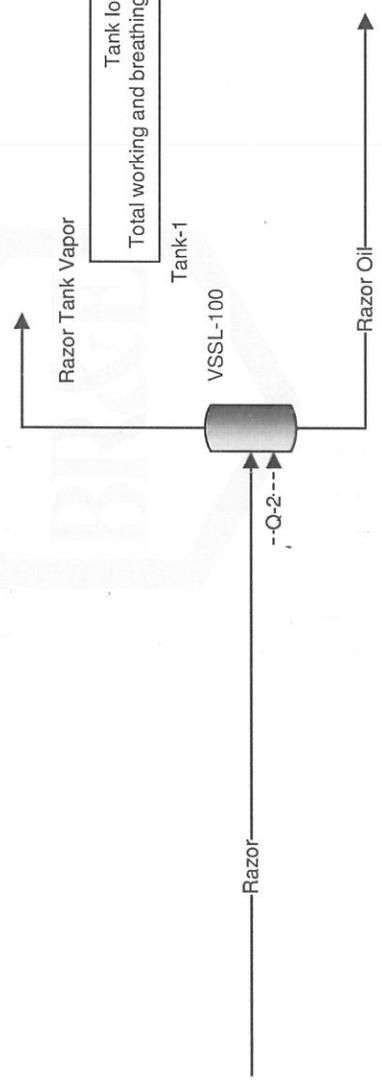
Process Streams	Flash State	Flash State	Oil	Flash State	Tank Vapor	Razor	Razor Oil	Razor Tank Vapor
Properties	Status:	Solved						
Phase: Light Liquid	From Block:	Oil Tanks	Oil Tanks	Oil Tanks	Oil Tanks	VSSL-100	VSSL-100	VSSL-100
Property	Units	To Block:	Oil Tanks	Oil Tanks	Oil Tanks	VSSL-100	VSSL-100	VSSL-100
Temperature	°F	128	60	128	60	128	60	128
Pressure	psig	74	0	74	0	74	0	74
Mole Fraction Vapor	%	0	0	0	0	0	0	0
Mole Fraction Light Liquid	%	100	100	100	100	100	100	100
Mole Fraction Heavy Liquid	%	0	0	0	0	0	0	0
Molecular Weight	lb/lbmol	177.142	182.144	177.142	182.144	177.142	182.144	177.142
Mass Density	lb/ft³	48.1430	50.0742	48.1430	50.0742	48.1430	50.0742	48.1430
Molar Flow	lbmol/h	27.8870	26.9576	27.8870	26.9576	27.8870	26.9576	27.8870
Mass Flow	lb/h	4939.96	4910.16	4939.96	4910.16	4939.96	4910.16	4939.96
Vapor Volumetric Flow	ft³/h	102.610	98.0575	102.610	98.0575	102.610	98.0575	102.610
Liquid Volumetric Flow	gpm	12.7930	12.2254	12.7930	12.2254	12.7930	12.2254	12.7930
Std Vapor Volumetric Flow	MMSCFD	0.253985	0.245520	0.253985	0.245520	0.253985	0.245520	0.253985
Std Liquid Volumetric Flow	sgpm	12.4180	12.2792	12.4180	12.2792	12.4180	12.2792	12.4180
Compressibility		0.0517482	0.00958530	0.0517482	0.00958530	0.0517482	0.00958530	0.0517482
Specific Gravity		0.771905	0.802871	0.771905	0.802871	0.771905	0.802871	0.771905
API Gravity		45.1000	44.7426	45.1000	44.7426	45.1000	44.7426	45.1000
Enthalpy	Btu/h	-3.93890E+06	-4.05925E+06	-3.93890E+06	-4.05925E+06	-3.93890E+06	-4.05925E+06	-3.93890E+06
Mass Enthalpy	Btu/lb	-797.355	-826.704	-797.355	-826.704	-797.355	-826.704	-797.355
Mass Cp	Btu/(lb*°F)	0.500305	0.459845	0.500305	0.459845	0.500305	0.459845	0.500305
Ideal Gas CpCv Ratio		1.02856	1.03108	1.02856	1.03108	1.02856	1.03108	1.02856
Dynamic Viscosity	cP	1.04444	2.19836	1.04444	2.19836	1.04444	2.19836	1.04444
Kinematic Viscosity	cSt	1.35435	2.74071	1.35435	2.74071	1.35435	2.74071	1.35435
Thermal Conductivity	Btu/(h*ft*°F)	0.0683108	0.0722545	0.0683108	0.0722545	0.0683108	0.0722545	0.0683108
Surface Tension	lb/ft	0.00170512?	0.00204503?	0.00170512?	0.00204503?	0.00170512?	0.00204503?	0.00170512?
Net Ideal Gas Heating Value	Btu/ft³	8741.36	8984.54	8741.36	8984.54	8741.36	8984.54	8741.36
Net Liquid Gas Heating Value	Btu/lb	18571.9	18564.1	18571.9	18564.1	18571.9	18564.1	18571.9
Gross Ideal Gas Heating Value	Btu/ft³	9335.30	9593.60	9335.30	9593.60	9335.30	9593.60	9335.30
Gross Liquid Heating Value	Btu/lb	19844.3	19833.1	19844.3	19833.1	19844.3	19833.1	19844.3

"Flash State Tank Vapor" C3+ Mass Flow = 92.73 ton/yr



Tank loss calculations for "Oil Loadout".
Total working and breathing losses from the Vertical Cylinder are 12.21 ton/yr.

"Razor Tank Vapor" C3+ Mass Flow = 145.8 ton/yr

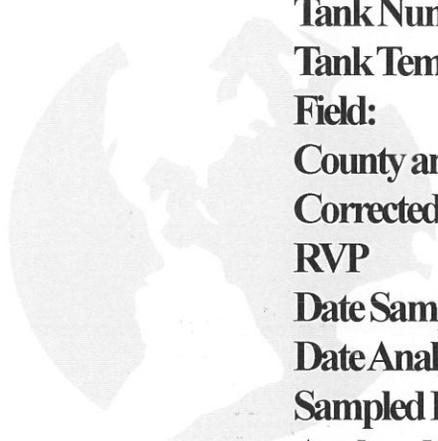


Tank loss calculations for "Razor Oil".
Total working and breathing losses from the Vertical Cylinder are 15.28 ton/yr.

Questar Energy Services

Applied Technology Services

API Gravity
Reid Vapor Pressure



Producer:	SM Energy
Well Name:	Razor State 4076-12-1FH
Tank Number:	113
Tank Temp *F:	44*
Field:	Finley
County and State:	Converse, WY
Corrected API Gravity:	44.1 @ 60°F
RVP	8.5#
Date Sampled:	12/9/14
Date Analyzed:	12/16/14
Sampled By:	Drebin
Analyzed By:	Small

QUESTAR APPLIED TECHNOLOGY

1210 D. Street, Rock Springs, Wyoming 82901

(307) 352-7292

LIMS ID:	N/A	Description:	Flash St. 4076-13-24-1FH
Analysis Date/Time:	12/12/2014 1:55 PM	Field:	Finley
Analyst Initials:	PRP	ML#:	SM Energy
Instrument ID:	Instrument 1	GC Method:	Quesbtex
Data File:	QPC09.D	GPA 2286	
Date Sampled:	12/9/2014		

Component	Mol%	Wt%	LV%
Methane	74.0148	52.1052	63.4463
Ethane	11.8861	15.6837	16.1195
Propane	6.8818	13.3164	9.5957
Isobutane	0.8487	2.1647	1.4049
n-Butane	2.4831	6.3332	3.9615
Neopentane	0.0180	0.0569	0.0348
Isopentane	0.6448	2.0415	1.1943
n-Pentane	0.6805	2.1546	1.2472
2,2-Dimethylbutane	0.0038	0.0142	0.0079
2,3-Dimethylbutane	0.0554	0.2095	0.1149
2-Methylpentane	0.1373	0.5191	0.2883
3-Methylpentane	0.0825	0.3121	0.1704
n-Hexane	0.1821	0.6887	0.3789
Heptanes	0.3101	1.3014	0.6370
Octanes	0.0295	0.1474	0.0739
Nonanes	0.0123	0.0652	0.0314
Decanes plus	0.0011	0.0067	0.0034
Nitrogen	0.6523	0.8019	0.3619
Carbon Dioxide	1.0758	2.0776	0.9278
Oxygen	0.0000	0.0000	0.0000
Hydrogen Sulfide	0.0000	0.0000	0.0000
Total	100.0000	100.0000	100.0000

Global Properties		Units	
Gross BTU/Real CF	1342.8		BTU/SCF at 60°F and 14.73 psia
Sat. Gross BTU/Real CF	1320.7		BTU/SCF at 60°F and 14.73 psia
Gas Compressibility (Z)	0.9957		
Specific Gravity	0.7887		air=1
Avg Molecular Weight	22.789		gm/mole
Propane GPM	1.886045		gal/MCF
Butane GPM	1.057842		gal/MCF
Gasoline GPM	0.798775		gal/MCF
26# Gasoline GPM	1.580701		gal/MCF
Total GPM	7.191971		gal/MCF
Base Mol%	99.966		%v/v

Sample Temperature:	142	°F
Sample Pressure:	54	psig
H2S Length of Stain Tube	N/A	ppm

Component	Mol%	Wt%	LV%
Benzene	0.0150	0.0513	0.0212
Toluene	0.0151	0.0610	0.0255
Ethylbenzene	0.0007	0.0030	0.0013
M&P Xylene	0.0027	0.0128	0.0054
O-Xylene	0.0006	0.0028	0.0011
2,2,4-Trimethylpentane	0.0137	0.0689	0.0349
Cyclopentane	0.0000	0.0000	0.0000
Cyclohexane	0.0651	0.2404	0.1121
Methylcyclohexane	0.0625	0.2692	0.1271
Description:	Flash St. 4076-13-24-1FH		

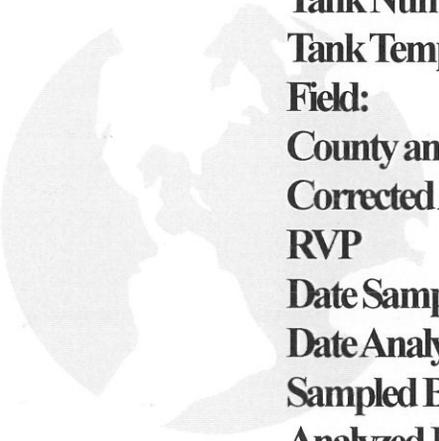
GRI GlyCalc Information

Component	Mol%	Wt%	LV%
Carbon Dioxide	1.0758	2.0776	0.9278
Hydrogen Sulfide	0.0000	0.0000	0.0000
Nitrogen	0.6523	0.8019	0.3619
Methane	74.0148	52.1052	63.4463
Ethane	11.8861	15.6837	16.1195
Propane	6.8818	13.3164	9.5957
Isobutane	0.8487	2.1647	1.4049
n-Butane	2.4831	6.3332	3.9615
Isopentane	0.6628	2.0984	1.2291
n-Pentane	0.6805	2.1546	1.2472
Cyclopentane	0.0000	0.0000	0.0000
n-Hexane	0.1821	0.6887	0.3789
Cyclohexane	0.0651	0.2404	0.1121
Other Hexanes	0.2790	1.0549	0.5815
Heptanes	0.1387	0.6106	0.3162
Methylcyclohexane	0.0625	0.2692	0.1271
2,2,4 Trimethylpentane	0.0137	0.0689	0.0349
Benzene	0.0150	0.0513	0.0212
Toluene	0.0151	0.0610	0.0255
Ethylbenzene	0.0007	0.0030	0.0013
Xylenes	0.0033	0.0156	0.0065
C8+ Heavies	0.0389	0.2007	0.1009
Subtotal	100.0000	100.0000	100.0000
Oxygen	0.0000	0.0000	0.0000
Total	100.0000	100.0000	100.0000

Questar Energy Services

Applied Technology Services

API Gravity
Reid Vapor Pressure



Producer:	SM Energy
Well Name:	Flash St.4076-13-24-1FH
Tank Number:	103
Tank Temp *F:	48*
Field:	Finley
County and State:	Converse, WY
Corrected API Gravity:	40.5 @60°F
RVP	7.2#
Date Sampled:	12/9/14
Date Analyzed:	12/13/14
Sampled By:	Drebin
Analyzed By:	Putnam

QUESTAR APPLIED TECHNOLOGY

1210 D. Street, Rock Springs, Wyoming 82901

(307) 352-7292

LIMS ID:	N/A	Description:	Razor St. 4076-12-1FH
Analysis Date/Time:	12/12/2014 11:06 AM	Field:	Finley
Analyst Initials:	PRP	ML#:	SM Energy
Instrument ID:	Instrument 1	GC Method:	Quesbtex
Data File:	QPC07.D	GPA 2286	
Date Sampled:	12/9/2014		

Component	Mol%	Wt%	LV%
Methane	72.8734	51.1786	62.1535
Ethane	13.0752	17.2114	17.6431
Propane	7.4065	14.2974	10.2754
Isobutane	0.9958	2.5337	1.6401
n-Butane	2.2012	5.6007	3.4940
Neopentane	0.0323	0.1021	0.0624
Isopentane	0.5982	1.8894	1.1024
n-Pentane	0.5135	1.6218	0.9363
2,2-Dimethylbutane	0.0075	0.0283	0.0158
2,3-Dimethylbutane	0.0409	0.1544	0.0844
2-Methylpentane	0.1121	0.4229	0.2342
3-Methylpentane	0.0679	0.2560	0.1394
n-Hexane	0.1362	0.5138	0.2819
Heptanes	0.2940	1.2358	0.6041
Octanes	0.0349	0.1738	0.0873
Nonanes	0.0190	0.1002	0.0481
Decanes plus	0.0026	0.0160	0.0079
Nitrogen	0.5672	0.6955	0.3131
Carbon Dioxide	1.0216	1.9682	0.8766
Oxygen	0.0000	0.0000	0.0000
Hydrogen Sulfide	0.0000	0.0000	0.0000
Total	100.0000	100.0000	100.0000

Global Properties	Units	
Gross BTU/Real CF	1348.8	BTU/SCF at 60°F and 14.73 psia
Sat. Gross BTU/Real CF	1326.5	BTU/SCF at 60°F and 14.73 psia
Gas Compressibility (Z)	0.9957	
Specific Gravity	0.7904	air=1
Avg Molecular Weight	22.844	gm/mole
Propane GPM	2.029845	gal/MCF
Butane GPM	1.017211	gal/MCF
Gasoline GPM	0.684523	gal/MCF
26# Gasoline GPM	1.378591	gal/MCF
Total GPM	7.483084	gal/MCF
Base Mol%	99.841	%v/v

Sample Temperature:	136	°F
Sample Pressure:	52	psig
H2S Length of Stain Tube	N/A	ppm

Component	Mol%	Wt%	LV%
Benzene	0.0115	0.0392	0.0161
Toluene	0.0162	0.0654	0.0273
Ethylbenzene	0.0008	0.0035	0.0015
M&P Xylene	0.0046	0.0215	0.0090
O-Xylene	0.0010	0.0048	0.0020
2,2,4-Trimethylpentane	0.0100	0.0502	0.0254
Cyclopentane	0.0000	0.0000	0.0000
Cyclohexane	0.0568	0.2094	0.0974
Methylcyclohexane	0.0655	0.2817	0.1326
Description:	Razor St. 4076-12-1FH		

GRI GlyCalc Information

Component	Mol%	Wt%	LV%
Carbon Dioxide	1.0216	1.9682	0.8766
Hydrogen Sulfide	0.0000	0.0000	0.0000
Nitrogen	0.5672	0.6955	0.3131
Methane	72.8734	51.1786	62.1535
Ethane	13.0752	17.2114	17.6431
Propane	7.4065	14.2974	10.2754
Isobutane	0.9958	2.5337	1.6401
n-Butane	2.2012	5.6007	3.4940
Isopentane	0.6305	1.9915	1.1648
n-Pentane	0.5135	1.6218	0.9363
Cyclopentane	0.0000	0.0000	0.0000
n-Hexane	0.1362	0.5138	0.2819
Cyclohexane	0.0568	0.2094	0.0974
Other Hexanes	0.2284	0.8616	0.4738
Heptanes	0.1340	0.5899	0.3053
Methylcyclohexane	0.0655	0.2817	0.1326
2,2,4 Trimethylpentane	0.0100	0.0502	0.0254
Benzene	0.0115	0.0392	0.0161
Toluene	0.0162	0.0654	0.0273
Ethylbenzene	0.0008	0.0035	0.0015
Xylenes	0.0056	0.0263	0.0110
C8+ Heavies	0.0501	0.2602	0.1308
Subtotal	100.0000	100.0000	100.0000
Oxygen	0.0000	0.0000	0.0000
Total	100.0000	100.0000	100.0000

Steffes Engineered Flare System

"Commitment to Innovation"

Innovative Solution to address Environmental Compliance

The Steffes Engineered Flare system is an innovative solution for combustion of oil production gases.

Steffes is committed to working with operators to provide the simplest and most reliable solution for their flaring requirements. After all, a flare capable of providing a very clean burn is of no value if it is not running.

Key features of the engineered flare include:

1. Variable annular orifice design gives optimum system performance over wide range of gas flows for both high pressure and low pressure gases. The annular orifice provides excellent mixing of air with the gas prior to combustion which helps to facilitate smokeless operation under most conditions.
2. Designed to help operators meet requirements of EPA 40 CFR 60.18
3. Modular design allows for high pressure flare tip, low pressure tip, and pilot to be used together or independently.
4. Constructed from high temperature resistant materials
5. Thermocouple monitoring of pilot
6. Many controller options available from a standard electric fencer with battery operated data logger to advanced burner management systems
7. The system includes everything you need to get running in the field.



Contact us for all your oil well site needs including storage tanks, walkways, engineered flares, treaters, secondary containment systems, cattle guards, pipe stands and many other accessory items.



Steffes Engineered Flare System

"Commitment to Innovation"

Support Posts for
Conductor, Thermocouple,
and Gauge Lines.

Ignition
System

Insulated
Conductor

3/8" OD S.S. Gauge Lines
and Inconel Thermocouple

Powder Coated
Steel Posts and Bases

Modular Design
3 Pieces
Can be used together,
or separately.

High Pressure
Flare Tip

Low Pressure
Flare Tip

Pilot

Enlarged View
Main Flare Tip

Gas Flow

Type 310
Stainless
Casting
Variable
Annular
Orifice

Enlarged View
Low Pressure Flare Tip

Gas Flow

Type 316
Stainless
Variable
Annular
Orifice

Enlarged View of Pilot.
(Windguard Removed for Clarity)

Igniter Rod
Thermocouple
Ground
Lug
Spark Gap
Adjustment



Specific Emission Unit Attributes:

Storage Tank/Silo

Company Equipment ID: Flash State Oil Tanks 1-8
Company Equipment Description: Flash Crude 1-8

Operating Status: Operating
Initial Construction Commencement Date: June-Oct 2014
Initial Operation Commencement Date: October 2014
Most Recent Construction/ Modification Commencement Date: NA

Most Recent Operation Commencement Date: NA

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Construction (Greenfield/New Facility)

If reason is Reconstruction or Temporary Permit or Other, please explain below:

Material Type: Liquid
Description of Material Stored: Crude Oil from Oil well production

Capacity: 400 Units: barrels
Maximum Throughput: 421 Units: barrels/day
Maximum Hourly Throughput: 35 Units: barrels/hr
Operating Pressure (psig): Atmosphere
Vapor Pressure of Material Stored (psig): RVP 7
Is Tank Heated?: No

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

2310010200

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24
Hours/year: 8760

Control Equipment: Yes No

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed BACT: 98% combustor

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): Not Affected

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): Not Affected

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): Not Affected

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: Not Affected

These rules are found under WAQSR Chapter 6, Section 13.

Specific Emission Unit Attributes:

Storage Tank/Silo

Company Equipment ID: Razor State Oil Tanks 1-8
Company Equipment Description: Flash Crude 1-8

Operating Status: Operating
Initial Construction Commencement Date: June-Oct 2014
Initial Operation Commencement Date: October 2014
Most Recent Construction/ Modification Commencement Date: NA

Most Recent Operation Commencement Date: NA

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Construction (Greenfield/New Facility)

If reason is *Reconstruction* or *Temporary Permit* or *Other*, please explain below:

Material Type: Liquid
Description of Material Stored: Crude Oil from Oil well production

Capacity: 400 Units: barrels
Maximum Throughput: 662 Units: barrels/day
Maximum Hourly Throughput: 55 Units: barrels/hr
Operating Pressure (psig): Atmosphere
Vapor Pressure of Material Stored (psig): RVP 7
Is Tank Heated?: No

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

2310010200

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24
Hours/year: 8760

Control Equipment: Yes No

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed BACT: 98% combustor

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): Not Affected

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): Not Affected

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): Not Affected

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): Not Affected

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: Not Affected

These rules are found under WAQSR Chapter 6, Section 13.

Specific Emission Unit Attributes:

Storage Tank/Silo

Company Equipment ID: Flash/Razor Produced Water Tanks
Company Equipment Description: Produced Water 1-4

Operating Status: Operating

Initial Construction Commencement Date: June-Oct 2014

Initial Operation Commencement Date: 10/15/2014

Most Recent Construction/ Modification Commencement Date: NA

Most Recent Operation Commencement Date: NA

Most Recent Operation Commencement Date: NA

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: Construction (Greenfield/New Facility)

If reason is Reconstruction or Temporary Permit or Other, please explain below:

Material Type: Liquid
Description of Material Stored: Produced water from Oil well production

Capacity: 400 Units: barrels

Maximum Throughput: 855 Units: barrels/day

Maximum Hourly Throughput: 72 Units: barrels/hr

Operating Pressure (psig): Atmosphere

Vapor Pressure of Material Stored (psig): 1 (water)

Is Tank Heated?: No

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

2310010200

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24

Hours/year: 8760

Control Equipment:

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed BACT: _____

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

Yes No

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS):

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61):

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63):

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD):

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review:

These rules are found under WAQSR Chapter 6, Section 13.

Control Equipment:

Flare/Combustor

Manufacturer: Steffes Dual Tip Flare Date Installed: June-Oct 2014
 Model Name and Number: Dual Tip Flare Company Control Equipment ID: Flash/Razor Flare
 Description: Flash/Razor tank vapor and emergency gas flare

Pollutant(s) Controlled:		<input type="checkbox"/> CO	<input type="checkbox"/> NOx	<input type="checkbox"/> Pb	<input type="checkbox"/> SO2	<input checked="" type="checkbox"/> VOC	<input type="checkbox"/> PM
<input type="checkbox"/> PM (FIL)	<input type="checkbox"/> PM Condensable	<input type="checkbox"/> PM 10 (FIL)	<input type="checkbox"/> PM 2.5 (FIL)	<input type="checkbox"/> PM 10	<input type="checkbox"/> PM 2.5		
<input checked="" type="checkbox"/> Other							

NOTE: The following fields require numeric values unless otherwise denoted with an asterisk*

Maximum Design Capacity (MMSCF/hr): High pressure tip 1.1, low 0.006 MMscf/hr
 Minimum Design Capacity (MMSCF/hr): High pressure tip 0.0011, low 4.4 scf/hr
 Design Control Efficiency (%): 98 Capture Efficiency (%): _____
 Operating Control Efficiency (%): 98
 Flare Type:* Enclosed Elevated Flare Type:* Non-Assisted
 Ignition Device:* Yes Flame Presence Sensor:* Yes
 Inlet Gas Temp (F): ambient at 90F Flame Presence Type:* Other
 Gas Flow Rate (acfm): Variable Outlet Gas Temp (F): 900

This is the only control equipment on this air contaminant source

If not, this control equipment is: Primary Secondary Parallel

List all other emission units that are also vented to this control equipment:*

List all release point IDs associated with this control equipment:*

This Flare controls tank vapors, and in emergency situations when associated gas can not be sold (or consumed by the treater heater).
 Tanks & Heater Treater (in emergencies)

Release Point Information:

Complete the table below for *each* release point. Please include release point information for each emission unit. Multiple attachments may be necessary. A release point is a point at which emissions from an emission unit are released into the ambient (outside) air. List each individual release point on a separate pair of lines (release point ID and description). *For longitude and latitude, use NAD 83/WGS84 datum and 5 digits after the decimal (i.e. 41.12345, -107.56789)*

Stack Release Point Information	
Company Release Point ID:	Release Point Type: <input type="text" value="Vertical"/>
Controlled Tank & Emergency gas Emissions	Release Point Latitude: <u>43.44467</u>
	Release Point Longitude: <u>-105.93287</u>
Company Release Point Description:	Base Elevation (ft): <u>5241</u>
Tank vapor and Associated gas combustor emissions	Stack Height (ft): <u>20</u>
	Stack Diameter (ft): <u>0.25</u>
	Exit Gas Velocity (ft/s): <u>300</u>
	Exit Gas Temp (F): <u>900</u>
	Exit Gas Flow Rate (acfm): <u>1178</u>
Company Release Point ID:	Release Point Type: <input type="text" value="Vertical"/>
Flash Heater Treater heater	Release Point Latitude: <u>43.44467</u>
	Release Point Longitude: <u>-105.93287</u>
Company Release Point Description:	Base Elevation (ft): <u>5241</u>
	Stack Height (ft): <u>20</u>
	Stack Diameter (ft): <u>1</u>
	Exit Gas Velocity (ft/s): <u>7.2</u>
	Exit Gas Temp (F): <u>575</u>
	Exit Gas Flow Rate (acfm): <u>340</u>
Company Release Point ID:	Release Point Type: <input type="text" value="Vertical"/>
Razor Heater Treater heater	Release Point Latitude: <u>43.44467</u>
	Release Point Longitude: <u>-105.93287</u>
Company Release Point Description:	Base Elevation (ft): <u>5241</u>
	Stack Height (ft): <u>20</u>
	Stack Diameter (ft): <u>1</u>
	Exit Gas Velocity (ft/s): <u>7.2</u>
	Exit Gas Temp (F): <u>575</u>
	Exit Gas Flow Rate (acfm): <u>340</u>
Company Release Point ID:	Release Point Type: <input type="text"/>
	Release Point Latitude: _____
	Release Point Longitude: _____
Company Release Point Description:	Base Elevation (ft): _____
	Stack Height (ft): _____
	Stack Diameter (ft): _____
	Exit Gas Velocity (ft/s): _____
	Exit Gas Temp (F): _____
	Exit Gas Flow Rate (acfm): _____

Complete the table below for each fugitive (area, volume, line) release point. List each individual release point on a separate line.

Fugitive Release Point Information	
Company Release Point ID:	Release Point Latitude: 43.44467
Fugs	Release Point Longitude: -105.93287
	Release Height (ft): between 1 and 30
Company Release Point Description:	
Fugitives, which by definition do not have a point, volume or line	
Company Release Point ID:	Release Point Latitude: _____
	Release Point Longitude: _____
	Release Height (ft): _____
Company Release Point Description:	
Company Release Point ID:	Release Point Latitude: _____
	Release Point Longitude: _____
	Release Height (ft): _____
Company Release Point Description:	
Company Release Point ID:	Release Point Latitude: _____
	Release Point Longitude: _____
	Release Height (ft): _____
Company Release Point Description:	