Caraline
13-2958C
009-00098

CLASS I ADMINISTRATIVE UPDATE APPLICATION

SWN Production Company, LLC

John Harwatt Pad

TRINITY CONSULTANTS
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Wexford, PA 15090
(724) 935-2611

April 2015

Trinity Consultants

Environmental solutions delivered uncommonly well

TABLE OF CONTENTS

SWN Production Company, LLC (SWN) is submitting this Class I Administrative Update to the West Virginia Department of Environmental Protection (WVDEP) for a natural gas production well pad located in Brooke County, West Virginia (John Harwatt Pad). Specifically, Southwestern is proposing to replace the existing vapor combustor (30 MMBtu/hr) with a new vapor combustor (8 MMBtu/hr). The John Harwatt Pad is currently permitted and operating under Permit No. R13-2958B

1.1. FACILITY AND PROJECT DESCRIPTION

The John Harwatt Pad is a natural gas production facility which extracts natural gas and liquids (condensate and produced water) from well deposits underneath the surface. Upon physical separation and heat treatment, the natural gas stream is transported from the well to gas line for additional processing and compression, as necessary. The liquids are stored in storage vessels in the facility.

The John Harwatt Pad currently consists of the following equipment:

- One (1) natural gas-fired Caterpillar G3306NA Engine (rated 145 HP) equipped with an NSCR (EU-ENG-1);
- Two (2) 1.0-MMBtu/hr natural gas-fired GPU burners (EU-GPU1, EU-GPU2));
- Two (2) 0.5-MMBtu/hr natural gas-fired heater treaters (EU-HT1, EU-HT2);
- Two (2) 1.5-MMBtu/hr line heaters (EU-LH1, EU-LH2);
- Six (6) 400-bbl condensate storage tanks (collectively known as EU-TANKS-COND);
- Six (6) 400-bbl produced water storage tanks (collectively known as EUTANKS-PW);
- Liquid loading operations; and
- One (1) 30.0-MMBtu/hr vapor combustor (APC-COMB-TKLD) with three (3) 50-SCFH natural gas-fired pilots (collectively known as EU-PILOTS)

As part of this application, Southwestern is proposing to install one (1) 8.0 MMBtu/hr vapor combustor which will replace the existing 30.0 MMBtu/hr vapor combustor listed above (APC-COMB-TKLD).

A process flow diagram is includes as Attachment F.

1.2. SOURCE STATUS

WVDEP must make stationary source determinations on a case-by-case basis using the guidance under the Clean Air Act (CAA) and EPA's and WVDEP's implementing regulations. WVDEP has previously determined that the John Harwatt Pad is a separate stationary source. There have been no changes to the information provided (outside of ownership change to SWN) that would change that determination. Therefore, the John Harwatt Pad will remain a separate stationary source with respect to permitting programs, including Title V and Prevention of Significant Deterioration (PSD).

1.3. PROPOSED EMISSION SOURCE CALCULATION

Emissions from the proposed project will result from combustion in the new vapor combustor. Emissions from combustion are calculated using published emission factors and the maximum heat input for the combustor. The project will not result in any change in emissions from the existing units controlled by the combustor as the control efficiency will remain unchanged and the smaller combustor size will result in an overall decrease in emissions at the facility. Detailed Emission calculations for the equipment affected by this project are presented in Attachment N.

1.4. R-13 APPLICATION ORGANIZATION

This R-13 permit application is organized as follows:

- Section 2: R-13 Application Forms;
- Attachment A: Business Certificate;
- Attachment B: Map;
- Attachment C: Installation and Start Up Schedule;
- Attachment D: Regulatory Discussion;
- Attachment F: Detailed Process Flow Diagram;
- Attachment G: Process Description;
- Attachment I: Emission Units Table;
- Attachment J: Emission Points Data Summary Sheet;
- Attachment K: Fugitive Emissions Data Summary Sheet;
- Attachment L: Emissions Unit Data Sheets;
- Attachment M: Air Pollution Control Device Sheet;
- Attachment N: Supporting Emission Calculations; and
- Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans

2. R-13 APPLICATION FORMS

The WVDEP permit application forms contained in this application include all applicable R-13 application forms including the required attachments.

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR QUALITY
601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

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

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

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

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

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

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

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

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
SWN Production Company LLC

2. Federal Employer ID No. ***(FEIN):***
26-4388727

3. Name of facility *(if different from above):*
John Harwatt Pad

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

5A. Applicant's mailing address:
10000 Energy Drive
Spring TX 77389

5B. Facility's present physical address:
Brooke County, West Virginia—near the town of West Liberty

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

7. If applicant is a subsidiary corporation, please provide the name of parent corporation:

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☒ **YES** ☐ **NO**
- If **YES,** please explain: Southwestern is leasing the land on which the site is constructed
- If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): Oil and natural gas production well pad

10. North American Industry Classification System **(NAICS)** code for the facility:
211111

11A. DAQ Plant ID No. (for existing facilities only):
009-00098

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
R13-2958B

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

12A.

- For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B.**

Travel north on SR 2 from Wheeling, WV to the intersection of SR 2 and CR 67 just south of the community of Wellsburg, WV. Turn right on SR 67 East and travel 6.05 miles to the intersection of CR 67 and SR 88. Turn right (south) onto CR 88 and travel 3.7 miles to the town of West Liberty. After travelling 3.7 miles of CR 88, CR 88 makes a 90 degree turn to the left, continue onto CR 7/5 (Apple Pie Ridge Road). The U.S. Post Office will be on the left where CR 88 makes the hard left. Travel 0.84 miles on CR 7/5 and the access road to the well pad will be on the right.

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
See Above	West Liberty	Brooke
12.E. UTM Northing (KM): 4,447.84519	12F. UTM Easting (KM): 536.66711	12G. UTM Zone: 17T

13. Briefly describe the proposed change(s) at the facility:
Southwestern proposes to replace the existing 30 MMBtu/hr flare with a new 8 MMBtu/hr flare.

14A. Provide the date of anticipated installation or change: / / – If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: / /	14B. Date of anticipated Start-Up if a permit is granted: As soon as possible

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

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

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

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

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

Section II. Additional attachments and supporting documents.

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

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

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

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

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

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

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

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

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

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

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

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

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

☒ General Emission Unit, specify Vapor Combustor Pilots

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

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

☐ Absorption Systems	☐ Baghouse	☒ Flare (Vapor Combustor)
☐ Adsorption Systems	☐ Condenser	☐ Mechanical Collector
☐ Afterburner	☐ Electrostatic Precipitator	☐ Wet Collecting System

☐ Other Collectors, specify

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

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

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

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

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

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

☐ **YES** ☒ **NO**

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

Section III. Certification of Information

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

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

Submit completed and signed **Authority Form** as **Attachment R.**

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

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☒ **Responsible Official** / ☐ **Authorized Representative,** hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE _____ DATE: 4/30/15

(Please use blue ink) *(Please use blue ink)*

35B. Printed name of signee: Paul Geiger		35C. Title: Sr. Vice President Ops Management
35D. E-mail: Paul_Geiger@swn.com	36E. Phone: 832-796-2920	36F. FAX:
36A. Printed name of contact person (if different from above): Kristi Evans		36B. Title: HSE Coordinator
36C. E-mail: Kristi_Evans@swn.com	36D. Phone: 304-884-1652	36E. FAX:

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

☒ **Attachment A: Business Certificate**
☒ **Attachment B: Map(s)**
☒ **Attachment C: Installation and Start Up Schedule**
☒ **Attachment D: Regulatory Discussion**
☐ **Attachment E: Plot Plan**
☒ **Attachment F: Detailed Process Flow Diagram(s)**
☒ **Attachment G: Process Description**
☐ **Attachment H: Material Safety Data Sheets (MSDS)**
☒ **Attachment I: Emission Units Table**
☒ **Attachment J: Emission Points Data Summary Sheet**
☒ **Attachment K: Fugitive Emissions Data Summary Sheet**
☒ **Attachment L: Emissions Unit Data Sheet(s)**
☒ **Attachment M: Air Pollution Control Device Sheet(s)**
☒ **Attachment N: Supporting Emissions Calculations**
☒ **Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans**
☒ **Attachment P: Public Notice**
☐ **Attachment Q: Business Confidential Claims**
☐ **Attachment R: Authority Forms**
☐ **Attachment S: Title V Permit Revision Information**
☐ **Application Fee**

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

☐ *Forward 1 copy of the application to the Title V Permitting Group and:*
☐ *For Title V Administrative Amendments:*
  ☐ *NSR permit writer should notify Title V permit writer of draft permit,*
☐ *For Title V Minor Modifications:*
  ☐ *Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,*
  ☐ *NSR permit writer should notify Title V permit writer of draft permit.*
☐ *For Title V Significant Modifications processed in parallel with NSR Permit revision:*
  ☐ *NSR permit writer should notify a Title V permit writer of draft permit,*
  ☐ *Public notice should reference both 45CSR13 and Title V permits,*
  ☐ *EPA has 45 day review period of a draft permit.*

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

ATTACHMENT A

Business Certificate

WEST VIRGINIA
STATE TAX DEPARTMENT

BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
SWN PRODUCTION COMPANY, LLC
5400D BIG TYLER RD
CHARLESTON, WV 25313-1103

BUSINESS REGISTRATION ACCOUNT NUMBER: **2307-3731**

This certificate is issued on: **12/8/2014**

This certificate is issued by the West Virginia State Tax Commissioner in accordance with Chapter 11, Article 12, of the West Virginia Code

The person or organization identified on this certificate is registered to conduct business in the State of West Virginia at the location above.

This certificate is not transferrable and must be displayed at the location for which issued.

This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them.
CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.

atL006 v.4
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ATTACHMENT B

Map


John Harwatt Pad
28/3
Apple Pie Ridge Rd
© 2015 Google
Google earth
Imagery Date: 5/16/2012 40°30'49.12" N 80°35'34.19" W elev 1143 ft eye alt 3665 ft

ATTACHMENT C

Installation and Start Up Schedule

ATTACHMENT C

Schedule of Planned Installation and Start-Up

Installation and start-up of the proposed equipment will be as soon as possible.

ATTACHMENT D

Regulatory Discussion

ATTACHMENT D - REGULATORY DISCUSSION

This section documents the applicability determinations made for Federal and State air quality regulations. In this section, applicability or non-applicability of the following regulatory programs is addressed:

- Prevention of Significant Deterioration (PSD) permitting;
- Title V of the 1990 Clean Air Act Amendments;
- New Source Performance Standards (NSPS);
- National Emission Standards for Hazardous Air Pollutants (NESHAP); and
- West Virginia State Implementation Plan (SIP) regulations.

This review is presented to supplement and/or add clarification to the information provided in the WVDEP R13 permit application forms.

In addition to providing a summary of applicable requirements, this section of the application also provides non-applicability determinations for certain regulations, allowing the WVDEP to confirm that identified regulations are not applicable to the wellpad. Note that explanations of non-applicability are limited to those regulations for which there may be some question of applicability specific to the operations at the wellpad. Regulations that are categorically non-applicable are not discussed (e.g., NSPS Subpart J, Standards of Performance for Petroleum Refineries).

Prevention of Significant Deterioration (PSD) Source Classification

Federal construction permitting programs regulate new and modified sources of attainment pollutants under Prevention of Significant Deterioration (PSD). PSD regulations apply when a major source makes a change, such as installing new equipment or modifying existing equipment, and a significant increase in emissions results from the change. The wellpad is not a major source with respect to the PSD program since its potential emissions will remain below all the PSD thresholds. As such, PSD permitting is not triggered by this construction activity.

Title V Operating Permit Program

Title 40 of the Code of Federal Regulations Part 70 (40 CFR 70) establishes the federal Title V operating permit program. West Virginia has incorporated the provisions of this federal program in its Title V operating permit program in West Virginia Code of State Regulations (CSR) 45-30. The major source thresholds with respect to the West Virginia Title V operating permit program regulations are 10 tons per year (tpy) of a single HAP, 25 tpy of any combination of HAP, and 100 tpy of all other regulated pollutants.[1] The potential emissions of all regulated pollutants are below the corresponding threshold(s) at this facility after the proposed project. Therefore, the wellpad is not a major source for Title V purposes.

New Source Performance Standards

New Source Performance Standards (NSPS), located in 40 CFR 60, require new, modified, or reconstructed sources to control emissions to the level achievable by the best demonstrated technology as specified in the applicable provisions. Moreover, any source subject to an NSPS is also subject to the general provisions of NSPS Subpart A, except where expressly noted. The proposed combustor is not an affected facility in an NSPS. The proposed combustor will meet the emission control efficiency of the existing combustor and, as such, there is no emission increase to the atmosphere from any equipment routed to the device. Therefore, modification under NSPS is not triggered by this proposed activity.

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[1] On June 23, 2014, the U.S Supreme Court decision in the case of *Utility Air Regulatory Group v. EPA* effectively changed the permitting procedures for GHGs under the PSD and Title V programs.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

Part 63 NESHAP allowable emission limits are established on the basis of a maximum achievable control technology (MACT) determination for a particular major source. A HAP major source is defined as having potential emissions in excess of 25 tpy for total HAP and/or potential emissions in excess of 10 tpy for any individual HAP. The wellpad is an Area (minor) source of HAP since its potential emissions of HAP are less than the 10/25 major source thresholds. The proposed project does not include any emission unit that is subject to NESHAP regulations and, therefore, this subpart does not apply.

West Virginia SIP Regulations

The wellpad is potentially subject to regulations contained in the West Virginia Code of State Regulations, Chapter 45 (Code of State Regulations). The Code of State Regulations fall under two main categories, those regulations that are generally applicable (e.g., permitting requirements), and those that have specific applicability (e.g., PM standards for manufacturing equipment).

45 CSR 6: Control of Air Pollution from the Combustion of Refuse

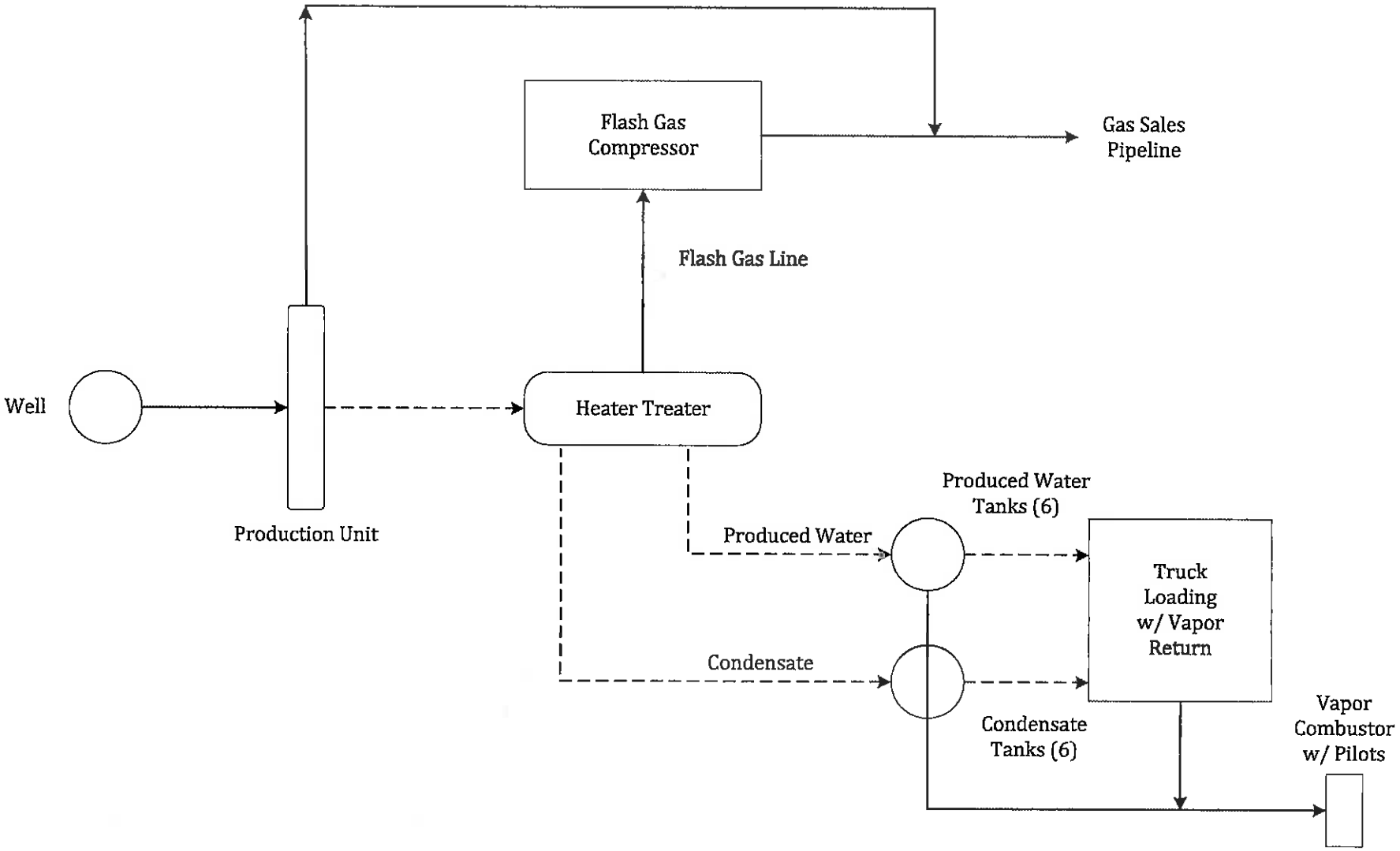
45 CSR 6 applies to activities involving incineration of refuse, defined as "the destruction of combustible refuse by burning in a furnace designed for that purpose. For the purposes of this rule, the destruction of any combustible liquid or gaseous material by burning in a flare or flare stack, thermal oxidizer or thermal catalytic oxidizer stack shall be considered incineration." The proposed enclosed combustor is an incinerator and therefore must comply with this regulation. Per 45 CSR 6-4.3, opacity of emissions from this unit shall not exceed 20 percent, except as provided by 4.4. PM emissions from this unit will not exceed the levels calculated in accordance with 6-4.1.

45 CSR 13: Permits for Construction

Potential emissions as a result of the proposed vapor combustor replacement will decrease. As such, the proposed change qualifies as a Class I administrative update.

ATTACHMENT F

Detailed Process Flow Diagram



Gas/Vapor

Liquids (Condensate and Produced Water)

SWN Production Company, LLC
John Harwatt Pad

Attachment F: Process Flow Diagram
April 2015

ATTACHMENT G

Process Description

ATTACHMENT G - PROCESS DESCRIPTION

Southwestern energy is proposing to replace the existing combustor (APC-COMB-TKLD) with one (1) 8.0 MMBtu/hr vapor combustor.

The facility is an oil and natural gas exploration and production facility, responsible for the production of condensate and natural gas. Storage of condensate and produced water will also occur on-site. A description of the facility process is as follows: Condensate, gas and water come from the wellhead to the production unit, where the first stage of separation occurs. Fluids (condensate and produced water) will be sent to the heater treater. The flash from the heater treater is captured via natural gas-fired engine-driven flash gas compressor. Produced water from the heater treater flows into the produced water storage tanks. Condensate flows into the condensate storage tanks.

The natural gas stream will exit the facility for transmission via pipeline. Condensate and produced water are transported offsite via truck. Loading emissions will be controlled with vapor return, which has at least 70% capture efficiency, and will be routed to the vapor combustor for at least 98% destruction efficiency. Working, breathing and flashing vapors from the condensate and produced water storage tanks will be routed to the remaining vapor combustor with a 98% capture efficiency to be burned with at least 98% combustion efficiency. The vapor combustor has natural gas-fired pilots to ensure a constant flame for combustion.

A process flow diagram is included as Attachment F.

ATTACHMENT I

Emission Units Table

Attachment I

Emission Units Table

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

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
EU-ENG1	EP-ENG1	Caterpillar G3306	2013	145 hp	N/A	NSCR
EU-GPU1	EP-GPU1	GPU Burner	2013	1.0-MMBtu/hr	N/A	N/A
EU-GPU2	EP-GPU2	GPU Burner	2013	1.0-MMBtu/hr	N/A	N/A
EU-HT1	EP-HT1	Heater Treater	2013	0.5-MMBtu/hr	N/A	N/A
EU-HT2	EP-HT2	Heater Treater	2013	0.5-MMBtu/hr	N/A	N/A
EU-LH1	EP-LH1	Line Heater	2012	1.5-MMBtu/hr	N/A	N/A
EU-LH2	EP-LH2	Line Heater	2013	1.5-MMBtu/hr	N/A	N/A
EU-TANKS-COND	EP-TANKS-COND	Six (6) Condensate Tanks	2013	400-bbl each	N/A	APC-COMB-TKLD-1
EU-TANKS-PW	EP-TANKS-PW	Six (6) Produced Water Tanks	2013	400-bbl each	N/A	APC-COMB-TK-LD-1
EU-LOAD-COND	EP-LOAD-COND	Condensate Truck Loading	2013	12,264,000 gallons	N/A	Vapor Return and APC-COMB-TKLD-1
EU-LOAD-PW	EP-LOAD-PW	Produced Water Truck Loading	2013	12,264,000 gallons	N/A	Vapor Return and APC-COMB-TKLD-1
APC-COMB-TKLD	APC-COMB-TKLD	Vapor Combustor	2013	30.0-mmBtu/hr	Removal	N/A
APC-COMB-TKLD-1	APC-COMB-TKLD-1	Vapor Combustor	2015	8.0-mmBtu/hr	New	N/A
EU-PILOTS	EP-PILOTS	Vapor Combustor Pilot	2013	150 SCFH	Removal	N/A
EU-PILOTS-1	EP-PILOTS-1	Vapor Combustor Pilot	2015	50 SCFH	New	N/A

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

ATTACHMENT J

Emission Points Data Summary Sheet

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table-& Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4,8]		Maximum Potential Controlled Emissions [5,8,9]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
APC-COMB-TKLD-1	Upward vertical stack	APC-COMB-TKLD-1	Vapor Combustor	-	None	N/A	N/A	NOx CO PM VOC CO_2e	1.10 2.20 0.02 141 937	4.84 9.65 0.10 617 4,103	1.10 2.20 0.02 2.82 937	4.84 9.65 0.10 12.35 4,103	Gas/Vapor	O = TCEQ, AP-42, Mass Balance, GHG MRR	N/A
EU-PILOT	Upward vertical stack	APC-COMB-TKLD-1	Vapor Combustor Pilot	-	None	N/A	N/A	NOx CO PM VOC CO_2e	< 0.01 < 0.01 < 0.01 < 0.01 5	0.02 0.02 < 0.01 < 0.01 23	< 0.01 < 0.01 < 0.01 < 0.01 5	0.02 0.02 < 0.01 < 0.01 23	Gas/Vapor	O = AP-42, GHG MRR	N/A

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

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

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

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

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

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data								
Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
APC-COMB-TKLD-1	4	1000 (est)			~1,144	25	4,447.84549	536.66711

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

ATTACHMENT K

Fugitive Emissions Data Summary Sheet

Attachment K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

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

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

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

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS [1]	Maximum Potential Uncontrolled Emissions [2]		Maximum Potential Controlled Emissions [3]		Est. Method Used [4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads	NA	---	---	---	---	---
Unpaved Haul Roads	No Emissions Change	---	---	---	---	---
Storage Pile Emissions	NA	---	---	---	---	---
Loading/Unloading Operations - Condensate	No Emissions Change	---	---	---	---	---
Loading/Unloading Operations – Produced Water	No Emissions Change	---	---	---	---	---
Wastewater Treatment Evaporation & Operations	NA	---	---	---	---	---

Equipment Leaks	No Emissions Change	—	—	—	—	—
General Clean-up VOC Emissions	NA	—	—	—	—	—
Other	NA	—	—	—	—	—

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. DO NOT LIST H_2, H_2O, N_2, O_2, and Noble Gases.

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

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

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

ATTACHMENT L

Emissions Unit Data Sheet

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): EU-PILOTS-1

1. Name or type and model of proposed affected source: One (1) natural gas-fired vapor combustor pilot. Rated at 50 SCFH
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: NA
4. Name(s) and maximum amount of proposed material(s) produced per hour: NA
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: Internal combustion of natural gas.

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form.*

6. Combustion Data (if applicable):

(a) Type and amount in appropriate units of fuel(s) to be burned:

Natural gas – 50 scf/hr

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

Natural gas with negligible H_2S and ash content.

(c) Theoretical combustion air requirement (ACF/unit of fuel):

@ °F and psia.

(d) Percent excess air: Unknown

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

45,250 Btu/hr @ 905 Btu/scf

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

NA

(g) Proposed maximum design heat input: 0.045 × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

@ °F and psia

a.	NO_X	5.00E-3	lb/hr	grains/ACF
b.	SO_2	3.00E-5	lb/hr	grains/ACF
c.	CO	4.20E-3	lb/hr	grains/ACF
d.	PM_{10}	3.80E-4	lb/hr	grains/ACF
e.	Hydrocarbons		lb/hr	grains/ACF
f.	VOCs	2.75E-4	lb/hr	grains/ACF
g.	Pb		lb/hr	grains/ACF
h.	Specify other(s)			
	Total HAPs	<0.01	lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF
			lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
As currently permitted	As currently permitted
REPORTING	**TESTING**
As currently permitted	As currently permitted

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

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

See attached manufacturer specification sheet

ATTACHMENT M

Air Pollution Control Device Sheet

Attachment M
Air Pollution Control Device Sheet
(Vapor Combustor SYSTEM)

Control Device ID No. (must match Emission Units Table): APC-COMB-TKLD-1

Equipment Information

1. Manufacturer: MRM Technologies

   Model No. TBF-4.0-25-71200

2. Method:
   - ☐ Elevated flare
   - ☐ Ground flare
   - ☒ Other

   Describe: Vapor Combustor

3. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

4. Method of system used:
   - ☐ Steam-assisted
   - ☐ Air-assisted
   - ☐ Pressure-assisted
   - ☒ Non-assisted

5. Maximum capacity of flare:
   - scf/min
   - scf/hr

6. Dimensions of stack:
   - Diameter 4 ft.
   - Height 25 ft.

7. Estimated combustion efficiency:
   (Waste gas destruction efficiency)
   - Estimated: ≥ 98 %
   - Minimum guaranteed: 98 %

8. Fuel used in burners:
   - ☒ Natural Gas
   - ☐ Fuel Oil, Number
   - ☐ Other, Specify:

9. Number of burners:

   Rating: 8 MMBtu/hr

10. Will preheat be used? ☐ Yes ☒ No

11. Describe method of controlling flame:
    Pilot monitored via flame rod.

12. Flare height: 25 ft

13. Flare tip inside diameter: N/A ft

14. Natural gas flow rate to flare pilot flame per pilot light:
    - ~0.83 scf/min
    - 50 scf/hr

15. Number of pilot lights: 1

    Total ~46,000 BTU/hr

16. Will automatic re-ignition be used? ☒ Yes ☐ No

17. If automatic re-ignition will be used, describe the method:
    Electrical restart

18. Is pilot flame equipped with a monitor? ☒ Yes ☐ No

    If yes, what type?
    - ☐ Thermocouple
    - ☐ Infra-Red
    - ☐ Ultra Violet
    - ☐ Camera with monitoring control room
    - ☒ Other, Describe: Flame rod

19. Hours of unit operation per year: 8760 (pilot only)

Steam Injection

20. Will steam injection be used? ☐ Yes ☒ No	21. Steam pressure PSIG Minimum Expected: Design Maximum:
22. Total Steam flow rate: LB/hr	23. Temperature: °F
24. Velocity ft/sec	25. Number of jet streams
26. Diameter of steam jets: in	27. Design basis for steam injected: LB steam/LB hydrocarbon
28. How will steam flow be controlled if steam injection is used?	

Characteristics of the Waste Gas Stream to be Burned

29. Name	Quantity Grains of H_2S/100 ft^3	Quantity (LB/hr, ft^3/hr, etc)	Source of Material
See attached emissions calculations			

30. Estimate total combustible to flare: (Maximum mass flow rate of waste gas)	71,200 LB/hr scf/day
31. Estimated total flow rate to flare including materials to be burned, carrier gases, auxiliary fuel, etc.:	
32. Give composition of carrier gases:	
33. Temperature of emission stream: 1000 °F Heating value of emission stream: ~2,682 BTU/ft^3 Mean molecular weight of emission stream: MW = lb/lb-mole	34. Identify and describe all auxiliary fuels to be burned. BTU/scf BTU/scf BTU/scf BTU/scf BTU/scf
35. Temperature of flare gas: ~1,000 °F	36. Flare gas flow rate: scf/min
37. Flare gas heat content: ~2,682 BTU/ft^3	38. Flare gas exit velocity: scf/min
39. Maximum rate during emergency for one major piece of equipment or process unit: scf/min	
40. Maximum rate during emergency for one major piece of equipment or process unit: BTU/min	
41. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):	
42. Describe the collection material disposal system:	
43. Have you included ***Flare Control Device*** in the Emissions Points Data Summary Sheet?	

44. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:	RECORDKEEPING:
As currently permitted	As currently permitted
REPORTING:	**TESTING:**
As currently permitted	As currently permitted

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

45. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
VOC – 98%
HAP – 98%

46. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
VOC – ≥ 98%
HAP – ≥ 98%

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

Tank Battery Combustor Specification Sheet
MRW Technologies, Inc.
Combustor Model Number: TBF-4.0-25-71200

Expected Destruction Removal Efficiency (DRE):	98% or Greater of Non-Methane Hydrocarbons
Unit Size:	4.0-foot Diameter 25-Foot Overall Height
Design Heat Input:	8 MMBTU/HR
Design Flow Rates:	71,200 SCFD
Design Heat Content:	2682 BTU/SCF
Waste Gas Flame Arrestor:	Enardo
Pilot Type:	MRW Electric Ignition
Pilot Operation (Continuous/Intermittent):	Continuous
Pilot Fuel Consumption:	50 SCFH or Less
Pilot Monitoring Device:	Flame Rod
Automatic Re-Ignition:	Included
Remote Alarm Indication:	Included

Description of Control Scheme:

The Combustor pilot is monitored via flame rod. If the pilot flame is lost, the control system will automatically attempt to relight the pilot. If the re-ignition attempt fails, the pilot solenoid valve will automatically close and a local & remote alarm signal will be generated to indicate loss of pilot flame.

ATTACHMENT N

Supporting Emission Calculations

Southwestern Energy
John Harwatt Pad
Vapor Combustor Emissions Calculations - Criteria and Hazardous Air Pollutants

Criterial and Hazardous Air Pollutant Emissions

Unit ID	Pollutant	Emision Factors[1]	Total Captured Emissions[2]		Combustor Destruction Efficiency	Total Controlled Emissions (Post-Capture and Combustion)	
			lb/hr	TPY	%	lb/hr	TPY
APC-COMB-TKLD	NOx	0.14	-	-	-	1.10	4.84
	CO	0.28	-	-	-	2.20	9.65
	PM	7.6	-	-	-	0.02	0.10
	VOC	Mass Balance	141	617.5	98.00%	2.82	12.35
	n-Hexane	Mass Balance	8	35.00	98.00%	0.16	0.70
	Benzene	Mass Balance	0.11	0.50	98.00%	<0.01	0.01
	Toluene	Mass Balance	0.5	2.50	98.00%	0.01	0.05
	Ethylbenzene	Mass Balance	0.5	2.50	98.00%	0.01	0.05
	Xylenes	Mass Balance	2.00	9.00	98.00%	0.04	0.18

Notes:

[1] Although a vapor combustor is not considered a flare by design, flare emission factors for NOx and CO were used to provide the most accurate emissions estimates. Although the combustor is designed to be smokeless, PM emissions have been estimated using AP-42 Table 1.4-1 factor (lb/mmscf) for a conservative estimate.

Hours per Year: 8760
Number of Combustors: 1
8 mmBTU/hr per combustor

NOx and CO emission factors (lb/mmBtu): *TCEQ Air Permit Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers* : High Btu waste streams (>1,000 Btu/scf) based on heat input to each combustor = 8 mmBTU/hr total heat input

[2] Total captured emissions are based on current potential emissions at the facility.

Southwestern Energy
John Harwatt Pad
Vapor Combustor Emissions Calculations - Greenhouse Gases

Equipment Information

Unit ID:	APC-COMB-TKLD
Description:	Vapor Combustor
Number of Combustors:	1
Burner Design Capacity (mmBTU/hr):	8
Stream HHV (Btu/scf):	2682
Annual Throughput (mmscf):	25.988
Annual Operating Hours:	8760

Greenhouse Gas Emissions

Pollutant	lb/hr	tons/yr
CO_2	935.82	4098.88
CH_4	0.02	0.08
N_2O	0.002	0.01
Total CO_2e	**937**	**4103**

40 CFR 98 Tables C-1 and C-2 Emission Factors (lb/mmBtu)

CO_2	53.06
CH_4	1.00E-03
N_2O	1.00E-04

40 CFR 98 Table A-1, Global Warming Potential (GWP) multiplier:

CO_2=	1
CH_4=	25
N_2O=	298

Southwestern Energy
John Harwatt Pad
Vapor Combustor Pilot Emissions Calculations

Criteria/ Pollutant and GHG Emissions

Unit ID	Pollutant	Emision Factors[1]	Total Captured Emissions[2]	
			lb/hr	TPY
EU-PILOT	NOx	100	5.00E-03	2.19E-02
	CO	84	4.20E-03	1.84E-02
	PM	7.6	3.80E-04	1.66E-03
	VOC	5.5	2.75E-04	1.20E-03
	SO_2	0.6	3.00E-05	1.31E-04
	CO_2	53.06	5.29	23.19
	CH_4	0.001	9.98E-05	4.37E-04
	N_2O	0.0001	9.98E-06	4.37E-05
	CO_2e		5	23

Notes:
[1] AP-42 Table 1.4-1 factor (lb/mmscf) for criteria pollutants and 40 CFR 98 Subpart C, Tables C-1

Hours per Year:	8760	
Number of Pilots:	1	
	50	scf/hr per pilot
Btu content:	905	Btu/scf

40 CFR 98 Table A-1, Global Warming Potential (GWP) multiplier:

CO_2=	1
CH_4=	25
N_2O=	298

ATTACHMENT O

Monitoring/Recordkeeping/Reporting/Testing Plans

ATTACHMENT O - MONITORING, RECORDING, REPORTING, AND TESTING PLANS

The Monitoring, Recording, Reporting and Testing Plans will be the same as those listed in the current permit, R13-2958B issued July 17, 2014.