Rathbone
PD15-095
051-00014

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DIVISION OF AIR QUALITY

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

PERMIT DETERMINATION FORM (PDF)

FOR AGENCY USE ONLY: PLANT I.D. # _____

PDF # _____ PERMIT WRITER: _____

1. NAME OF APPLICANT (AS REGISTERED WITH THE WV SECRETARY OF STATE'S OFFICE):
Trans Energy, Inc.

2. NAME OF FACILITY (IF DIFFERENT FROM ABOVE):
Goshorn (1H - 4H) Well Pad Site

3. NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODE:
211111

4A. MAILING ADDRESS: **PO Box 393**
St. Marys, WV 26170

4B. PHYSICAL ADDRESS:
See Attachment A for Map for Site Location

5A. DIRECTIONS TO FACILITY (PLEASE PROVIDE MAP AS ATTACHMENT A): **I – 70W to Route 2 South into Moundsville, WV, Take SR 21 East to SR 62 South, follow 1.6 miles to a right onto Long Road, follow for 0.3 miles to a left turn onto lease road. Follow lease road to well pad.**

5B. NEAREST ROAD:	5C. NEAREST CITY OR TOWN:	5D. COUNTY:
State Route 62 / Long Road	**Cameron**	**Marshall**
5E. UTM NORTHING (KM):	5F. UTM EASTING (KM):	5G. UTM ZONE:
4407.3808	**532.9117**	**17N**

6A. INDIVIDUAL TO CONTACT IF MORE INFORMATION IS REQUIRED:
Leslie A. Gearhart

6B. TITLE:
VP of Operations

6C. TELEPHONE:	6D. FAX:	6E. E-MAIL:
304-684-7053	**304-684-3658**	**lesliegearhart@transenergyinc.com**

7A. DAQ PLANT I.D. NO. (FOR AN EXISTING FACILITY ONLY):
NA

7B. PLEASE LIST ALL CURRENT 45CSR13, 45CSR14, 45CSR19 AND/OR TITLE V (45CSR30) PERMIT NUMBERS ASSOCIATED WITH THIS PROCESS (FOR AN EXISTING FACILITY ONLY):

7C. IS THIS PDF BEING SUBMITTED AS THE RESULT OF AN ENFORCEMENT ACTION? IF YES, PLEASE LIST: **NO**

8A. TYPE OF EMISSION SOURCE (CHECK ONE):
x **NEW SOURCE** ☐ **ADMINISTRATIVE UPDATE**
☐ **MODIFICATION** ☐ **OTHER** (PLEASE EXPLAIN IN 11B)

8B. IF ADMINISTRATIVE UPDATE, DOES DAQ HAVE THE APPLICANT'S CONSENT TO UPDATE THE EXISTING PERMIT WITH THE INFORMATION CONTAINED HEREIN?
☐ **YES** ☐ **NO**

9. IS *DEMOLITION* OR PHYSICAL *RENOVATION* AT AN EXISTING FACILITY INVOLVED? ☐ **YES** x **NO**

10A. DATE OF ANTICIPATED INSTALLATION OR CHANGE:	10B. DATE OF ANTICIPATED START-UP:
April, 2012	**Operational**

11A. PLEASE PROVIDE A **DETAILED PROCESS FLOW DIAGRAM** SHOWING EACH PROPOSED OR MODIFIED PROCESS EMISSION POINT AS **ATTACHMENT B**.

11B. PLEASE PROVIDE A **DETAILED PROCESS DESCRIPTION** AS **ATTACHMENT C**.

12. PLEASE PROVIDE **MATERIAL SAFETY DATA SHEETS (MSDS)** FOR ALL MATERIALS PROCESSED, USED OR PRODUCED AS **ATTACHMENT D**. FOR CHEMICAL PROCESSE, PLEASE PROVIDE A MSDS FOR EACH COMPOUND EMITTED TO AIR.

13A. **REGULATED AIR POLLUTANT EMISSIONS:**

⇒ **FOR A NEW FACILITY,** PLEASE PROVIDE PLANT WIDE EMISSIONS BASED ON THE POTENTIAL TO EMIT (PTE) FOR THE FOLLOWING AIR POLLUTANTS INCLUDING ALL PROCESSES.

⇒ **FOR AN EXISTING FACILITY,** PLEASE PROVIDE THE PROPOSED CHANGE IN EMISSIONS BASED ON THE PTE OF ALL PROCESS CHANGES FOR THE FOLLOWING AIR POLLUTANTS.

PTE FOR A GIVEN POLLUTANT IS TYPICALLY BEFORE AIR POLLUTION CONTROL DEVICES AND IS COLLECTED BASED ON THE MAXIMUM DESIGN CAPACITY OF PROCESS EQUIPMENT.

POLLUTANT	**HOURLY PTE** (LB/HR)	**YEARLY PTE** (TON/YR) (HOURLY PTE MULTIPLIED BY 8760 HR/YR) DIVIDED BY 2000 LB/TON
PM	NA	NA
PM_{10}	0.022	.010
VOC's	1.28	5.617
CO	0.25	1.08
NO_x	0.29	1.27
SO_2	0.0018	0.008
Pb	NA	NA
HAPs (AGGREGATE AMOUNT)	NA	NA
TAPs (INDIVIDUALLY)*	Insignificant	Insignificant
OTHER (INDIVIDUALLY)*	NA	NA

* ATTACH ADDITIONAL PAGES AS NEEDED

13B. PLEASE PROVIDE ALL **SUPPORTING CALCULATIONS** AS **ATTACHMENT E.**

CALCULATE AN HOURLY AND YEARLY PTE OF EACH PROCESS EMISSION POINT (SHOWN IN YOUR DETAILED PROCESS FLOW DIAGRAM) FOR ALL AIR POLLUTANTS LISTED ABOVE INCLUDING INDIVIDUAL HAP'S (LISTED IN SECTION 112[b] OF THE 1990 CAAA), TAP'S (LISTED IN 45CSR27), AND OTHER AIR POLLUTANTS (E.G. POLLUTANTS LISTED IN TABLE 45-13A OF 45CSR13, MINERAL ACIDS PER 45CSR7, ETC.).

14. **CERTIFICATION OF DATA**

I, LESLIE A. GEARHART (*TYPE NAME*) ATTEST THAT ALL THE REPRESENTATIONS CONTAINED IN THIS APPLICATION, OR APPENDED HERETO, ARE TRUE, ACCURATE, AND COMPLETE TO THE BEST OF MY KNOWLEDGE BASED ON INFORMATION AND BELIEF AFTER REASONABLE INQUIRY, AND THAT I AM A ***RESPONSIBLE OFFICIAL******** (*PRESIDENT, VICE PRESIDENT, SECRETARY OR TREASURER, GENERAL PARTNER OR SOLE PROPRIETOR*) OF THE APPLICANT.

SIGNATURE OF RESPONSIBLE OFFICIAL: Leslie A. Gearhart

TITLE: **VICE PRESIDENT OF OPERATIONS** DATE: **MARCH 3, 2015**

****** THE DEFINITION OF THE PHRASE '***RESPONSIBLE OFFICIAL***' CAN BE FOUND AT 45CSR13, SECTION 2.23.

NOTE: PLEASE CHECK ENCLOSED ATTACHMENTS:

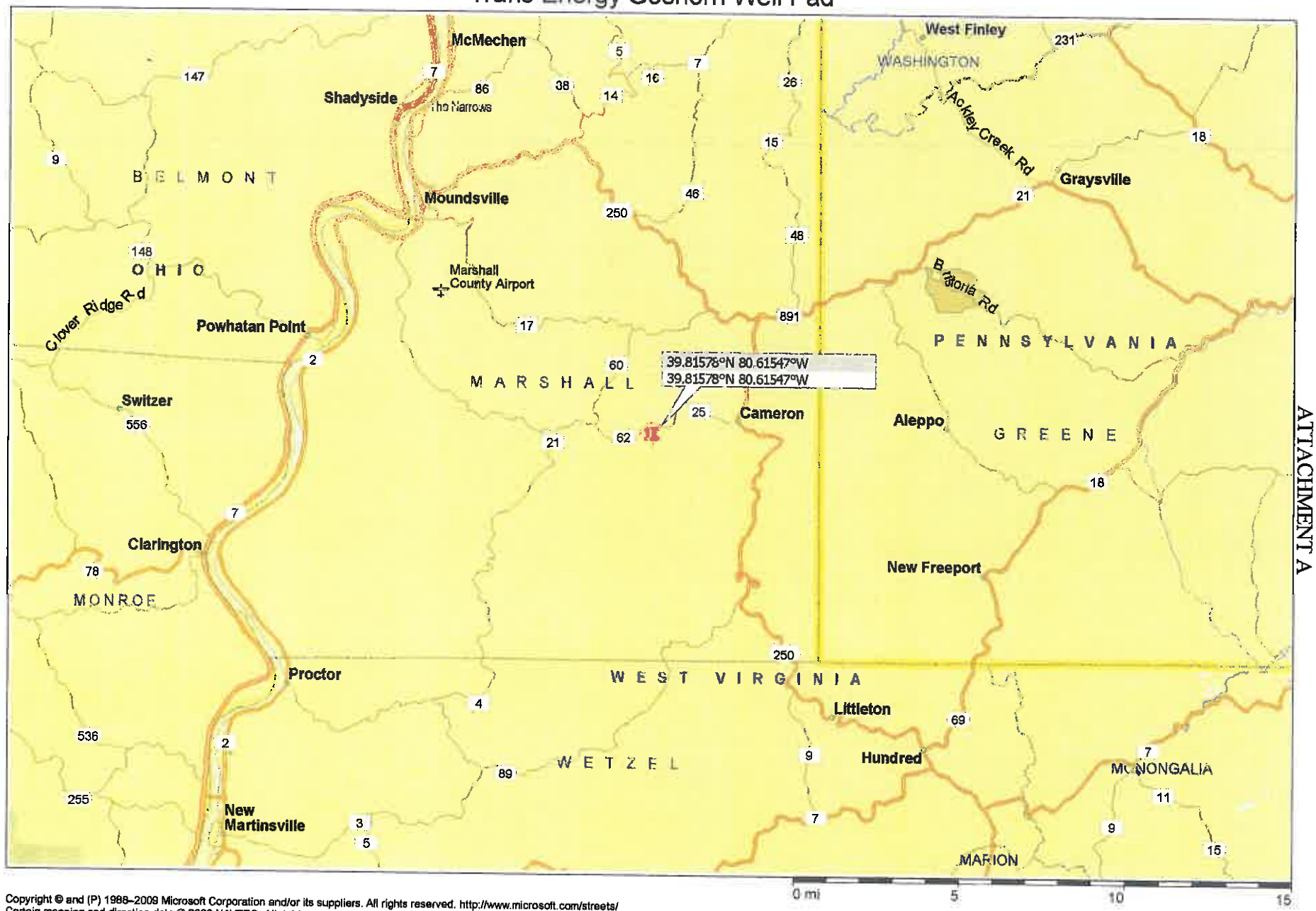
X ATTACHMENT A x ATTACHMENT B x ATTACHMENT C x ATTACHMENT D x ATTACHMENT E

RECORDS ON ALL CHANGES ARE REQUIRED TO BE KEPT AND MAINTAINED ON-SITE FOR TWO (2) YEARS.

THE PERMIT DETERMINATION FORM WITH THE INSTRUCTIONS CAN BE FOUND ON DAQ'S PERMITTING SECTION WEB SITE:

www.dep.wv.gov/daq

Trans Energy Goshorn Well Pad



ATTACHMENT A

input coordinates

enter comma delimited coordinates. examples:
38 15 30.1, -81 25 15.2 (lat, lon as degrees minutes seconds)
38.123456, -81.123456 (lat, lon as decimal degrees)
500000, 4100000 (UTM as easting, northing)
1981954.32, 324123.45 (WV state plane as easting, northing)

39.81578,-80.61547

Lat/Lon WGS 1984

Convert | zoom to point

output coordinates

532911.7,4407380.8

UTM NAD83 Zone 17N

Google Maps

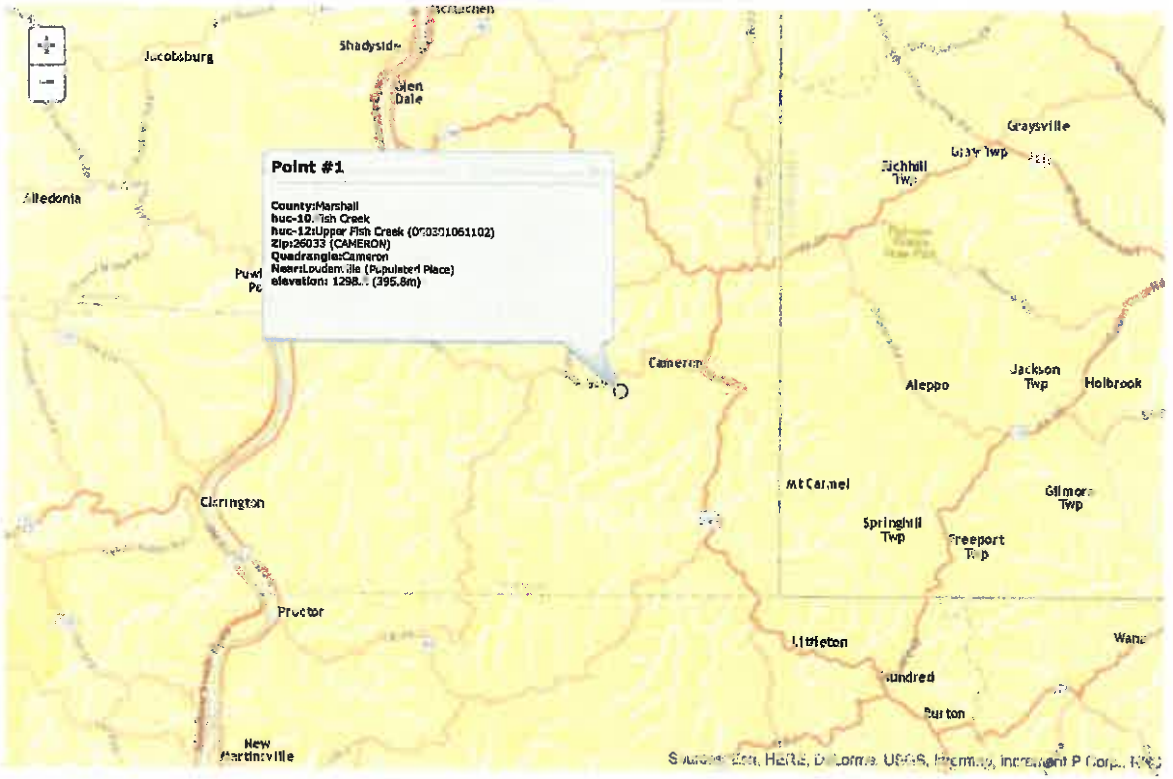
history

1,39.81578,-80.61547,0,LL,WGS84(01150),532911.7,4407380.8,UTM17N,NAD83(CORS96)

notes about datum conversions

Datum conversions between all realizations of NAD27, NAD83, and WGS84 are not practical, or sometimes not strictly possible. Many of the issues are associated with the inability to convert between the original realization of NAD83 and more recent realizations. While error could be reduced by introducing an intermediate HARN conversion, separate transformations would have to be implemented for each state, which significantly increases the complexity of the application. Therefore datum conversions include a few built-in assumptions:

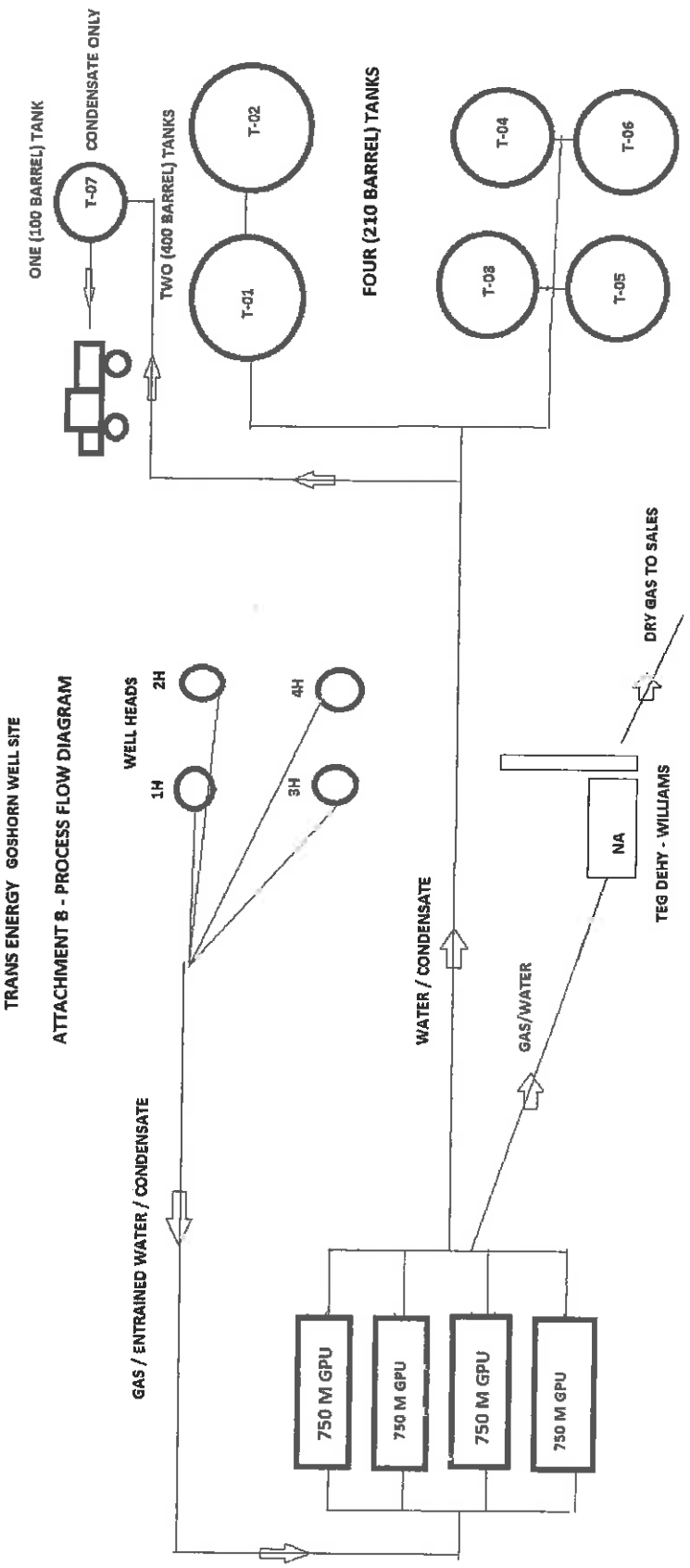
1. Conversions between NAD27 and NAD83. This accounts for the...



clear markers | world map | maps | topo

ATTACHMENT A

ATTACHMENT B



ATTACHMENT C

DETAILED PROCESS DESCRIPTION

Natural Gas (methane, ethane, propane, etc.) comes from Four (4) high pressure wells and are piped to suction field separators & Gas Processing Units which removes most of the water entrained in the gas stream by disturbance of the gas flow inside the separators, the water and trace amounts of Oil/Condensate is dumped out of the separators using high pressure gas to a Two (2) 400 barrel (16,800 gallons/tank), Four (4) 210 barrel (8820 gallons/tank) and one (1) 100 barrel (4200 gallons) steel holding tanks.

SITE Equipment (See Flow Diagram) will entail Four (4) well heads, Four (4) GPU/Separators and Two (2) 400 barrel & Four (4) 210 barrel storage tanks for used water and small amount of condensate from the wells that is in the gas stream.

Similar Samples of the fluid (Water & small amount of condensate) were taking at common type well at a sample port before the dump valve and analyzed to determine a GWR (Gas to Water Ratio) this data was used to calculate VOC emission from a water flash to the tanks. The GPU emissions were determined using AP-42 values for heat input of 3.0 MMBTU/hr for all GPU's. Tanks 4.09d was used to determine working & breathing emissions, and Truck Load loss was determined by standard calculations and attached and PTE was determined using NO capture efficiency for NSPS Subpart XX was used because of PTE.

Sources for Emissions:

- Four (4) GPUs
- Two (2) 400 barrel tanks – Working/Standing (Breathing)/ Flash Loss
- Four (4) 210 barrel tanks– Working/Standing (Breathing)/ Flash Loss
- One (1) 100 barrel tank– Working/Standing (Breathing)/ Flash Loss
- Truck Load Loss
- TEG Dehydrator – Not Applicable – Owned and Permitted by Williams Pipeline

The final emissions for all the pieces of equipment on this site will be the result of all airborne pollutants. The TOTAL emission after controls is well under the W.V. stated thresholds of 6lbs/hr and 10 tons/year for each criteria pollutant and below 2 lbs/hr and 5 tons/year of Hazardous Air Pollutants (HAP's), which should yield an exemption from obtaining an air permit for this compression site facility.

ATTACHMENT D

No MSDS Sheets are required for this Permit Determination Form

ATTACHMENT E

Trans Energy Goshorn Well Site 1H – 4H

1. Four (4) 750,000 BTU/hr. GPU (Gas Processing Units / Separators) AP-42 Emissions
2. Two (2) 400 Barrel & Four (4) 210 Barrel Storage Tanks – 4.09d, Produced Water Emission Results, Truck Load Loss

Produced Water Emission Results

Cubic Feet of Gas Liberated from Produced Water
Cubic Feet/Year = (GWR = Cubic FT^3/Barrel) (Barrel/year)
From FESCO Report Stock Tank GWR = 3.49 FT^3/Barrel – SIMILAR WELL
Barrels/day = From Trans Energy Report of 123,418 Barrels/Year
(3.49) (123,418) = 430,729 Cubic Feet of Gas Liberated per year (FT^3/year)

Convert Cubic Feet of gas liberated to Tons of emissions per year using following methodology

FT^3/year = 430,729
MW = 18.18 from gas analysis

TPY = (MW) (FT^3/Year) (28,317 cm^3/FT^3) (gr-mole/23,890 cm^3) (lb-mole/454 gr-mole) (ton-mole/2000 lb-mole)

Tons/year = 10.22 = 10.22 Tons/year

Tons CO2/year = (wt%CO2/100) (Tons/year) = wt%CO2 = 4.1 = (4.1/100) (10.22) = 0.42 TPY

Tons CH4/year = (wt%CH4/100) (Tons/year) = wt%CH4 = 81 = (81/100) (10.22) = 8.27 TPY

From Standard Gas Analysis Attached VOC's (NMNEHC) 100 – 81 WT% Methane – 12 WT% Ethane – 4.1 WT% CO2 = 2.9 WT% NMNEHC (VOC's) = 2.9 WT%

Tons VOC (NMNEHC)/Year = (wt%C3+/100) = wt%VOC = (2.9/100) (10.22) = 0.296 Tons/Year

VOC's = 0.296 TPY

HAP's (BTEX) Benzene, Toluene, Ethyl benzene, Xylene, Hexane = 0.00 WT% = 0.00 %
HAP's (0.00) (7.1) = **0.00 TPY HAPS**

Total Well Site VOC Emissions Water Flash 0.296 TPY + W&B 0.011 TPY + GPU's 0.07 TPY + LL 5.24 TPY
Total VOC = 5.617 Tons/Year (1.28 lbs/hr)

GHG (CO2(e)) = 1546 separators + 0.42 water flash = 1547 TPY
GHG(CH4) = 0.03 separators + 8.27 water flash = 8.3 TPY

ATTACHMENT E

Date: March 3, 2015

Owner of Source: Trans Energy, Inc. Site: Goshorn Well site

County: Marshall County, WV

Latitude/Longitude: 39.81578 N / 80.61547 W

Mass Emission Calculations for a Natural Gas Engine Stationary Source

Make GPU QTY 4 Model 750MBTU/hr

Heat Input (MMBTU/hr) 0.750 x 4 = 3.0

EPA AP-42 Natural Gas Combustion Emission Factors from Table 1.4-2

Pollutant	(lb/10^6 SCF)	lb/hr	Ton/Year lb/hr*8760/2000	Method AP-42
NOx	100	0.29	1.27	AP-42
CO	84	0.25	1.08	AP-42
VOC	5.5	0.016	0.07	AP-42
HCHO	0.075	NA	NA	AP-42
PM(Total)	7.6	0.022	0.10	AP-42
SOx	0.6	0.0018	0.008	AP-42
GHG CO2(e) CH4	120,000 2.3	353 0.007	1546 0.03	AP-42

Emissions Above are **Totals** of all FOUR (4) GPUs

ATTACHMENT E

Trans Energy Corporation

Goshorn 1H – 4H Well Site Location

Truck Loading Emissions

$L L = 12.46 \times [(S*P*M) \div T] \times (1\text{-}EFF/1)$

$L L = 12.46 \times [(1.00 * 4.73 * 18.18) \div (70^{o}F + 460)] \times (1 -(0)]$

$L L = 12.46 \times [86 \div 530] \times 1$

$LL = 12.46 \times 0.593 \times 1$

$LL = 2.02$

LL = 2.02 pounds per 1,000 gallons

Where:

LL = loading loss, pounds per 1,000 gallons

S = saturation factor (Table 5.2-1)

P = true vapor pressure of liquid loaded (psia)

M = Molecular weight of vapors

T = temperature of bulk liquid loaded, ^{o}R (^{o}F + 460)

EFF = VRU reduction efficiency

Bbl/year was taken from data supplied by Trans Energy for the 2014 calendar year = 123,418 barrels (H2O/NGL/Oil)

Total: (Goshorn) (123,418 bbl/year = 5,183,556 gallons/year) – Water & Condensate (NGL & Oil) for all four wells

5,186,556 ÷ 1,000 = 5183

5,183,556 gal x 2.02 lbs/1000 gal = 10,470 lbs of VOC annual for **Goshorn Tanks 1, 2, 3, 4, 5 & 6 = 5.24 TPY**

Assume loading into trucks that are leak tested based on NSPS Subpart XX with a capture efficiency of 98.7%.
(5.24 Tons/year) x (1-0.987) = 0.07 TPY

Vapor balance service is a line hose connected to top of tank truck sending the vapors back to the tank being unloaded. Control efficiency 95% x 70% by AP-42

As per WVDAQ assume for PTE that capture efficiency of 98.7% does not exist.

Tanks Truck Load Loss = 1.196 lbs/hr or 5.24 Tons/Year VOC's

TANKS 4.0.9d

Emissions Report - Summary Format

Tank Indentification and Physical Characteristics

Identification		
User Identification:	Goshorn	
City:	Charleston	
State:	West Virginia	
Company:	Trans Energy	
Type of Tank:	Vertical Fixed Roof Tank	
Description:	Well Site 1H-4H	
Tank Dimensions		
Shell Height (ft):		12.00
Diameter (ft):		10.00
Liquid Height (ft) :		11.00
Avg. Liquid Height (ft):		6.00
Volume (gallons):		6,462.73
Turnovers:		1.70
Net Throughput(gal/yr):		10,986.63
Is Tank Heated (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	Gray/Medium	
Shell Condition	Good	
Roof Color/Shade:	Gray/Medium	
Roof Condition:	Good	
Roof Characteristics		
Type:	Dome	
Height (ft)		0.00
Radius (ft) (Dome Roof)		0.00
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: Charleston, West Virginia (Avg Atmospheric Pressure = 14.25 psia)

ATTACHMENT E

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

Goshorn - Vertical Fixed Roof Tank
Charleston, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Jet kerosene	All	63.43	53.60	73.25	58.06	0.0094	0.0069	0.0123	130.0000			162.00	Option 1: VP60 = .0085 VP70 = .011

ATTACHMENT E

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

Emissions Report for: Annual

Goshorn - Vertical Fixed Roof Tank
Charleston, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Jet kerosene	0.32	2.95	3.27

ATTACHMENT E

WORKING PER TANK: $0.32 \frac{lbs}{yr} \cdot \frac{1\ TN}{2000\ lbs} = 0.00016\ TPY$

$\times 6\ TANKS = 0.001\ TPY$

BREATHING PER TANK: $2.95 \frac{lbs}{yr} \cdot \frac{1\ TN}{2000\ lbs} = 0.0015\ TPY$

$\times 6\ TANKS = 0.01\ TPY$

IN 4B TANKS TOTAL = 0.011 TPY