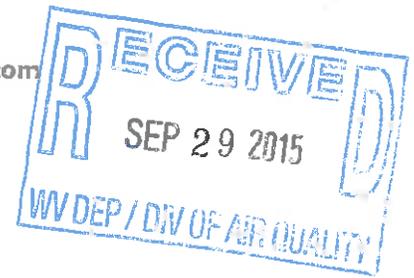


MK Midstream Holdings, LLC.
65 Professional Place
Suite 200
Bridgeport, WV 26330

Phone: (724) 940-1272
Fax: (304) 848-9134
E-mail: lpaugh@mkeystone.com
September 15, 2015



APPLICATION FOR GENERAL PERMIT REGISTRATION (G35-A) NATURAL GAS COMPRESSOR STATIONS

Submitted To: West Virginia Department of Environmental Protection

Division of Air Quality

Bev McKeone

601 57th Street

Charleston, WV 25304

(304) 926 - 0475

*MK Midstream Holdings^{LLC}
PDC West Compressor
033-00187 / G35-A107B
Roy
(Requested cd's from company)
also removed copy of check*

MK Midstream Holdings, LLC.

Goff West Station - General Permit Class II Modification

Fee Submitted \$500 + \$1,000 NSPS \$NA = \$1,500

G35-A107A 033-00187 Issued April 24, 2015

Prepared by: Environmental Compression Services, Inc.

33 Spruce Lane

Burgettstown, PA 15021

(724)-272-5734 – Mobile

bmonroe@atc-pa.com

Environmental Laboratory Registration 63-03526

William M. Monroe

www.envircomp.com

Environmental Compression Services, Inc.

WWW.ENVIRCOMP.COM

33 Spruce Lane

Burgettstown, PA 15021-2728

(724) 272-5734 – Mobile

bmonroe@atc-pa.com

Environmental Laboratory Registration# 63-03526

West Virginia –Department of Environmental Protection
Division of Air Quality - Beverly McKeone
601 57th Street, SE
Charleston, WV25304

September 15, 2015

Reference: General Permit Registration Modification
Goff West Compressor Station
G35-A107A Plant ID# 033-00187
Clarksburg, Harrison County, West Virginia

Dear Beverly McKeone – NSR Manager

MK Midstream Holdings, LLC is submitting a General Permit G-35A Registration Modification package for their Goff West Compressor Station facility, Plant ID# 033-00187, located in Harrison County, WV

This facility is operating under a current G35-A107A registration issued April 24, 2015 under PDC Mountaineer, LLC's name. Unsure why this permit is in PDC Mountaineer's name, we had submitted the Change of Ownership Buyers letter agreement with the previous permit application in regards to MK Midstream Holdings, LLC intentions for the modification to this permit.

As per 033-00187 and G35-A107A (Enclosed): There are Two (2) Caterpillar Model G3516Bs, and Two (45 MMSCFD) TEG Dehydration units. In lieu of Four Additional (4) New Caterpillar G3516B's to be installed (Phased in over time), only Two (2) New Caterpillar G3516ULB's were set, modification to permit includes the addition of One New Caterpillar G3608TALE (2370 BHP) and One New Caterpillar G3606TALE (1775 BHP) with an end result of:

- Four (4) Caterpillar G3516ULB (1380 BHP)
- One Caterpillar G3608TALE (2370 BHP)
- One Caterpillar G3606TALE (1775 BHP)
- Two (2) 45 MMSCFD TEG Dehydration units
- Associated tanks, piping and valves on this facility.

Please feel free to contact myself directly if WVDEP – DAQ has any questions or concerns regarding the information in this General Permit Registration Modification.

Sincerely,



William M. Monroe
President

Enclosures



WEST VIRGINIA
 DEPARTMENT OF ENVIRONMENTAL PROTECTION
 DIVISION OF AIR QUALITY
 601 - 57th Street SE
 Charleston, WV 25304
 Phone: (304) 926-0475 • www.wvdep.org

APPLICATION FOR GENERAL PERMIT REGISTRATION
 CONSTRUCT, MODIFY, RELOCATE OR ADMINISTRATIVELY UPDATE
 A STATIONARY SOURCE OF AIR POLLUTANTS

PLEASE CHECK ALL THAT APPLY (IF KNOWN):
 CONSTRUCTION MODIFICATION RELOCATION
 ADMINISTRATIVE UPDATE AFTER-THE-FACT

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

CHECK WHICH TYPE OF GENERAL PERMIT REGISTRATION YOU ARE APPLYING FOR:

- G10-C – Coal Preparation and Handling
- G20-B – Hot Mix Asphalt
- G30-D – Natural Gas Compressor Stations
- G33-A – Class I Spark Ignition Internal Combustion Engine
- G35-A – Natural Gas Compressor Stations (Flare/Glycol Dehydration Unit)

- G40-C – Nonmetallic Minerals Processing
- G50-B – Concrete Batch
- G60-C – Class II Emergency Generator
- G65-C – Class I Emergency Generator

SECTION I. GENERAL INFORMATION

1. NAME OF APPLICANT (AS REGISTERED WITH THE WV SECRETARY OF STATE'S OFFICE):
MK Midstream Holdings, LLC

2. FEDERAL EMPLOYER ID NO. (FEIN):
 47-1919654

3. APPLICANT'S MAILING ADDRESS:
 65 Professional Place, Suite 200
 Bridgeport, WV 26330

4. IF APPLICANT IS A SUBSIDIARY CORPORATION, PLEASE PROVIDE THE NAME OF PARENT CORPORATION: Mountaineer Keystone, LLC

5. WV 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 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.

SECTION II. FACILITY INFORMATION

7. TYPE OF PLANT OR FACILITY (STATIONARY SOURCE) TO BE CONSTRUCTED, MODIFIED, RELOCATED OR ADMINISTRATIVELY UPDATED (E.G., COAL PREPARATION PLANT, PRIMARY CRUSHER, ETC.):
 Natural Gas Compressor Station – Class II General Permit Modification

8. STANDARD INDUSTRIAL CLASSIFICATION (SIC) CODE FOR THE FACILITY:
 1311

9A. DAQ PLANT I.D. NO. (FOR AN EXISTING FACILITY): 033 -00187	10A. LIST ALL CURRENT 45CSR13 AND 45CSR30 (TITLE V) PERMIT NUMBERS ASSOCIATED WITH THIS PROCESS (FOR EXISTING FACILITY ONLY): G35-A107A
---	--

PRIMARY OPERATING SITE INFORMATION

11A. NAME OF PRIMARY OPERATING SITE: GOFF WEST STATION	12A. MAILING ADDRESS OF PRIMARY OPERATING SITE: Route 50E, Davisson Run Road, Clarksburg, Harrison County, WV
---	--

13A. DOES THE APPLICANT OWN, LEASE, HAVE AN OPTION TO BUY, OR OTHERWISE HAVE CONTROL OF THE *PROPOSED SITE*?

YES NO

— IF YES, PLEASE EXPLAIN: Applicant Owns the Station

— IF NO, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.

14A. — FOR MODIFICATIONS or ADMINISTRATIVE UPDATES, 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.

From I-79 take Route 50 West through Clarksburg and at first traffic light, make a left onto Davisson Run Road (Rt 98), follow approximately 1.2 miles to lease road on right. Follow up lease road to Goff West Station.

INCLUDE A MAP AS ATTACHMENT F.

15A. NEAREST CITY OR TOWN: Clarksburg	16A. COUNTY: Harrison	
17A. UTM NORTHING (KM): 4347.731	18A. UTM EASTING (KM): 551.408	19A. UTM ZONE: 17

1ST ALTERNATE OPERATING SITE INFORMATION (G20-B, G40-C, G50-C only)

11B. NAME OF PRIMARY OPERATING SITE: <hr/> <hr/>	12B. MAILING ADDRESS OF PRIMARY OPERATING SITE: <hr/> <hr/>
--	---

13B. DOES THE APPLICANT OWN, LEASE, HAVE AN OPTION TO BUY, OR OTHERWISE HAVE CONTROL OF THE *PROPOSED SITE*?

YES NO

— IF YES, PLEASE EXPLAIN: _____

— IF NO, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.

14B. - FOR MODIFICATIONS or ADMINISTRATIVE UPDATES, 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 F.

15B. NEAREST CITY OR TOWN:	16B. COUNTY:	
17B. UTM NORTHING (KM):	18B. UTM EASTING (KM):	19B. UTM ZONE:

2ND ALTERNATE OPERATING SITE INFORMATION (G20-B, G40-C, G50-C only)

11C. NAME OF PRIMARY OPERATING SITE:	12C. MAILING ADDRESS OF PRIMARY OPERATING SITE:
_____	_____

13C. DOES THE APPLICANT OWN, LEASE, HAVE AN OPTION TO BUY, OR OTHERWISE HAVE CONTROL OF THE PROPOSED SITE?

YES NO

- IF YES, PLEASE EXPLAIN: _____

- IF NO, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.

14C. - FOR MODIFICATIONS or ADMINISTRATIVE UPDATES, 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 F.

15C. NEAREST CITY OR TOWN:	16C. COUNTY:	
17C. UTM NORTHING (KM):	18C. UTM EASTING (KM):	19C. UTM ZONE:

20. PROVIDE THE DATE OF ANTICIPATED INSTALLATION OR CHANGE: <u>11 / 20 / 2015</u>	21. DATE OF ANTICIPATED START-UP IF REGISTRATION IS GRANTED:
- IF THIS IS AN AFTER-THE-FACT PERMIT APPLICATION, PROVIDE THE DATE UPON WHICH THE PROPOSED CHANGE DID HAPPEN:	12/1/2015

22. PROVIDE MAXIMUM PROJECTED OPERATING SCHEDULE OF ACTIVITY/ ACTIVITIES OUTLINED IN THIS APPLICATION:

HOURS PER DAY 24 DAYS PER WEEK 7 WEEKS PER YEAR 52 PERCENTAGE OF OPERATION 100%

SECTION III. ATTACHMENTS AND SUPPORTING DOCUMENTS

PLEASE CHECK ALL ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

Please See the appropriate reference document for an explanation of the attachments listed below.

- ATTACHMENT A : CURRENT BUSINESS CERTIFICATE
- ATTACHMENT B: PROCESS DESCRIPTION
- ATTACHMENT C: DESCRIPTION OF FUGITIVE EMISSIONS
- ATTACHMENT D: PROCESS FLOW DIAGRAM
- ATTACHMENT E: PLOT PLAN
- ATTACHMENT F: AREA MAP
- ATTACHMENT G: AFFECTED SOURCE SHEETS
- ATTACHMENT H: BAGHOUSE AIR POLLUTION CONTROL DEVICE SHEET
- ATTACHMENT I: EMISSIONS CALCULATIONS
- ATTACHMENT J: CLASS I LEGAL ADVERTISEMENT
- ATTACHMENT K: ELECTRONIC SUBMITTAL DISKETTE
- CERTIFICATION OF INFORMATION
- ATTACHMENT L: GENERAL PERMIT REGISTRATION APPLICATION FEE
- ATTACHMENT M: SITING CRITERIA WAIVER

PLEASE MAIL AN ORIGINAL AND TWO COPIES OF THE COMPLETE GENERAL PERMIT REGISTRATION APPLICATION WITH THE SIGNATURE(S) TO THE DAQ PERMITTING SECTION AT THE ADDRESS SHOWN ON THE FRONT PAGE. PLEASE DO NOT FAX PERMIT APPLICATIONS. FOR QUESTIONS REGARDING APPLICATIONS OR WEST VIRGINIA AIR POLLUTION RULES AND REGULATIONS PLEASE CALL (304) 926-0475.

SECTION IV. CERTIFICATION OF INFORMATION

This General Permit Registration Application shall be signed below by a Responsible Official. A Responsible Official is a President, Vice President, Secretary, Treasurer, General Partner, General Manager, a member of a Board of Directors, or Owner, depending on business structure. A business may certify an Authorized Representative who shall have authority to bind the Corporation, Partnership, Limited Liability Company, Association, Joint Venture or Sole Proprietorship. Required records of daily throughput, hours of operation and maintenance, general correspondence, Emission Inventory, Certified Emission Statement, compliance certifications and all required notifications must be signed by a Responsible Official or an Authorized Representative. If a business wishes to certify an Authorized Representative, the official agreement below shall be checked off and the appropriate names and signatures entered. Any administratively incomplete or improperly signed or unsigned Registration Application will be returned to the applicant.

FOR A CORPORATION (domestic or foreign)

G I certify that I am a President, Vice President, Secretary, Treasurer or in charge of a principal business function of the corporation

FOR A PARTNERSHIP

G I certify that I am a General Partner

FOR A LIMITED LIABILITY COMPANY

G I certify that I am a General Partner or General Manager

FOR AN ASSOCIATION

G I certify that I am the President or a member of the Board of Directors

FOR A JOINT VENTURE

G I certify that I am the President, General Partner or General Manager

FOR A SOLE PROPRIETORSHIP

G I certify that I am the Owner and Proprietor

is an Authorized Representative and in that capacity shall represent the interest of the business (e.g., Corporation, Partnership, Limited Liability Company, Association Joint Venture or Sole Proprietorship) and may obligate and legally bind the business. If the business changes its Authorized Representative, a Responsible Official shall notify the Chief of the Office of Air Quality immediately, and/or,

I hereby certify that all information contained in this General Permit Registration Application and any supporting documents appended hereto is, to the best of my knowledge, true, accurate and complete, and that all reasonable efforts have been made to provide the most comprehensive information possible

Signature

(please use blue ink)

Responsible Official

09/24/15

Date

Name & Title

Len Paugh - COO & SVP

(please print or type)

Signature

(please use blue ink)

Authorized Representative (if applicable)

09/24/15

Date

Applicant's Name Len Paugh

Phone & Fax 724-940-1100

304-848-9134

Phone

Fax

Email lpaugh@mkeystone.com

ATTACHMENT A

**Current 2015 West Virginia Business Certificate Place Here
(i.e.: Certificate of Incorporation/organization/Limited Partnership – ONE PAGE ONLY)**

**WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION
CERTIFICATE**

ISSUED TO:
**MK MIDSTREAM HOLDINGS, LLC
65 PROFESSIONAL PL 200
BRIDGEPORT, WV 26330-1889**

BUSINESS REGISTRATION ACCOUNT NUMBER: 2306-9776

This certificate is issued on: **02/19/2015**

*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.

PROCESS DESCRIPTION

ATTACHMENT B & C

Pipeline quality natural gas (methane) is supplied to Four (4) Caterpillar G3516ULB Internal combustion engine (1380 BHP @ 1400 RPM/each) all with Model DC-65 Oxidation Catalytic Converters, One (1) Caterpillar G3608TALE (2370 BHP @ 1000 RPM) with EMIT oxidation catalyst, and One (1) Caterpillar G3606TALE (1775 BHP @ 1000 RPM), equipped with a DCL model DC-64 oxidation catalyst, all for emission reductions. The engines drive compressors to move the natural gas through a pipeline into Two (2) 45.0 MMSCFD TEG (Tri-Ethylene Glycol) Dehydrator for drying the gas to below 7.0 lbs/MMSCFD of Water Content and eventually sell the dried clean natural gas into a sales line that has a higher pressure (psig) than the wells can produce on their own at.

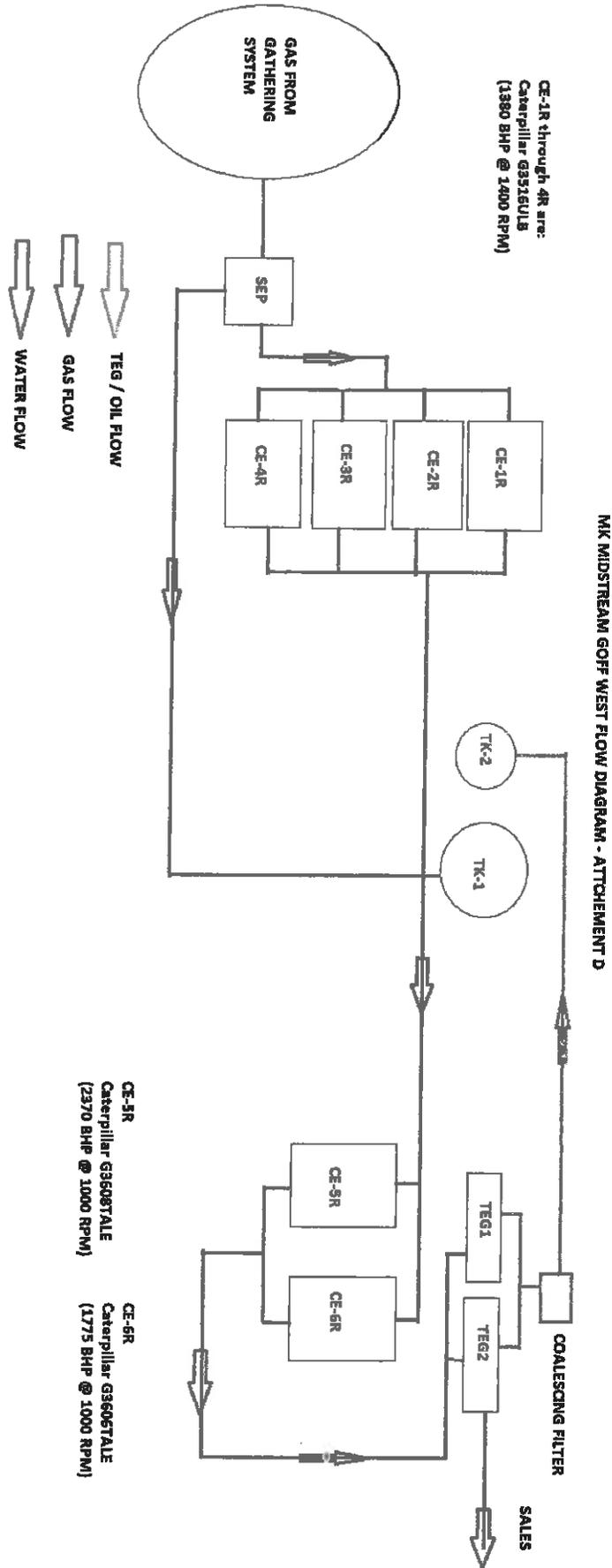
The engine burns the dried hot natural gas from the discharge of the dehydrator and products of combustion are exhausted through an exhaust line and into a Catalytic Converter and then to a Hospital Grade Muffler/Silencer through a tailpipe and into the atmosphere.

The Tri-Ethylene Glycol (TEG) Dehydrators use a type of anti-freeze to remove water that is entrained in the gas stream. The re-boiler heats the glycol to a certain temperature and a pump pushes the glycol up through the tower that also has the natural gas flowing through it and absorption tray vessel (Tower) stripes out the water and it is dropped out of the gas stream and piped to a waste tank. The re-boiler has a stack on it and the only real pollutant that is measurable is VOC's (Volatile Organic Chemicals) or Non-Methane Hydrocarbons off of what is called the still column. NOx & CO is the product of combustion of natural gas through the burner and these are vented to the atmosphere through the fire-tube.

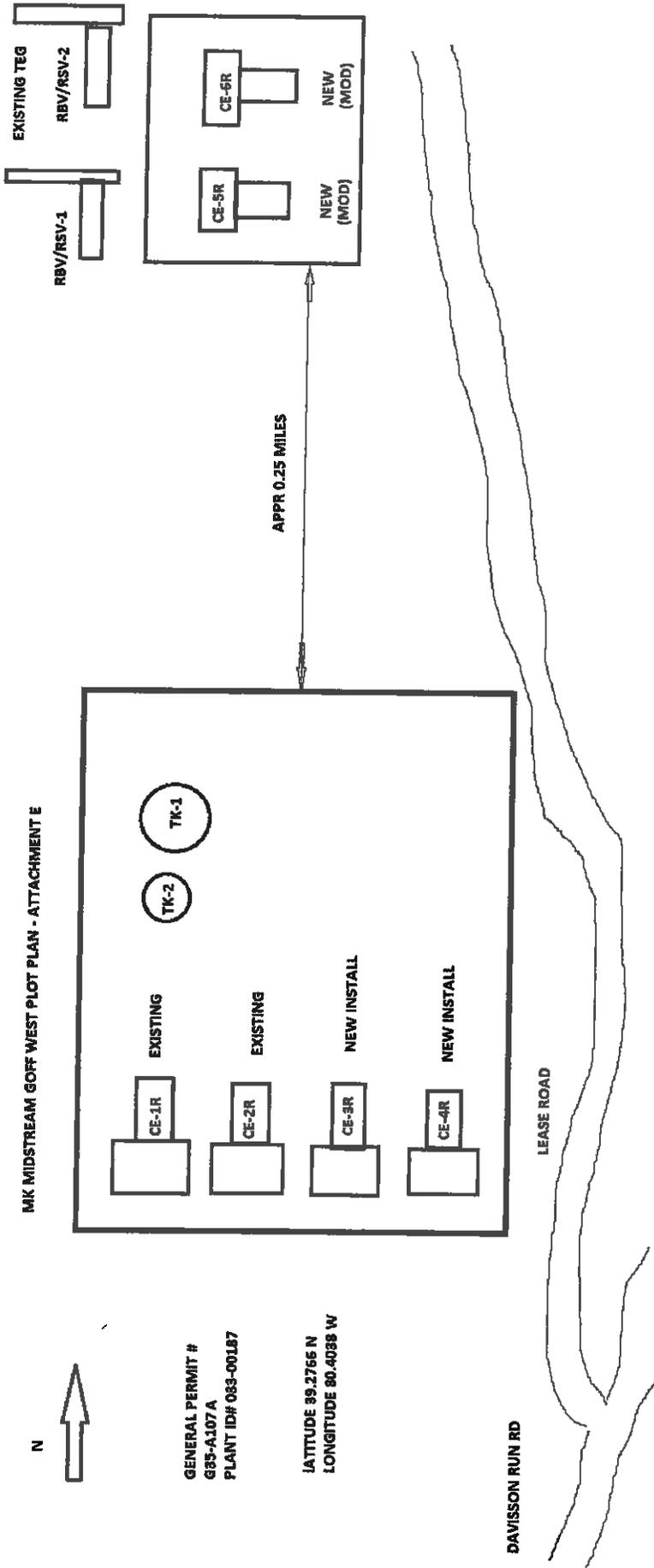
Most of the lube oils from the compressor are entrained in the gas stream, but what is caught in a coalescent filter is piped to a waste tank and hauled away by a company like Safety Clean, who disposes of it properly. The engine oil and filters that must be used to keep engine running and in good condition is also piped to either the same tank that has a containment dike around it for accidental spills, is also drained periodically by a safety company that disposes it properly.

There are fugitive emissions associated with piping connections, valves, and controllers. These emissions occur due to potential seepage from connections, flanges and open ended lines.

ATTACHMENT D



ATTACHMENT E



N



GENERAL PERMIT #
G85-A107 A
PLANT ID# 083-00187

LATITUDE 99.2766 N
LONGITUDE 80.4038 W

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, nothing)
 1987654.32, 364123.45 (NW state plane as easting, nothing)

36.2766, -80.4038

Lat/Lon WGS 1984

Convert zoom to point

output coordinates

551424.9, 4347640.4

UTM NAD83 Zone 17N

Google Maps

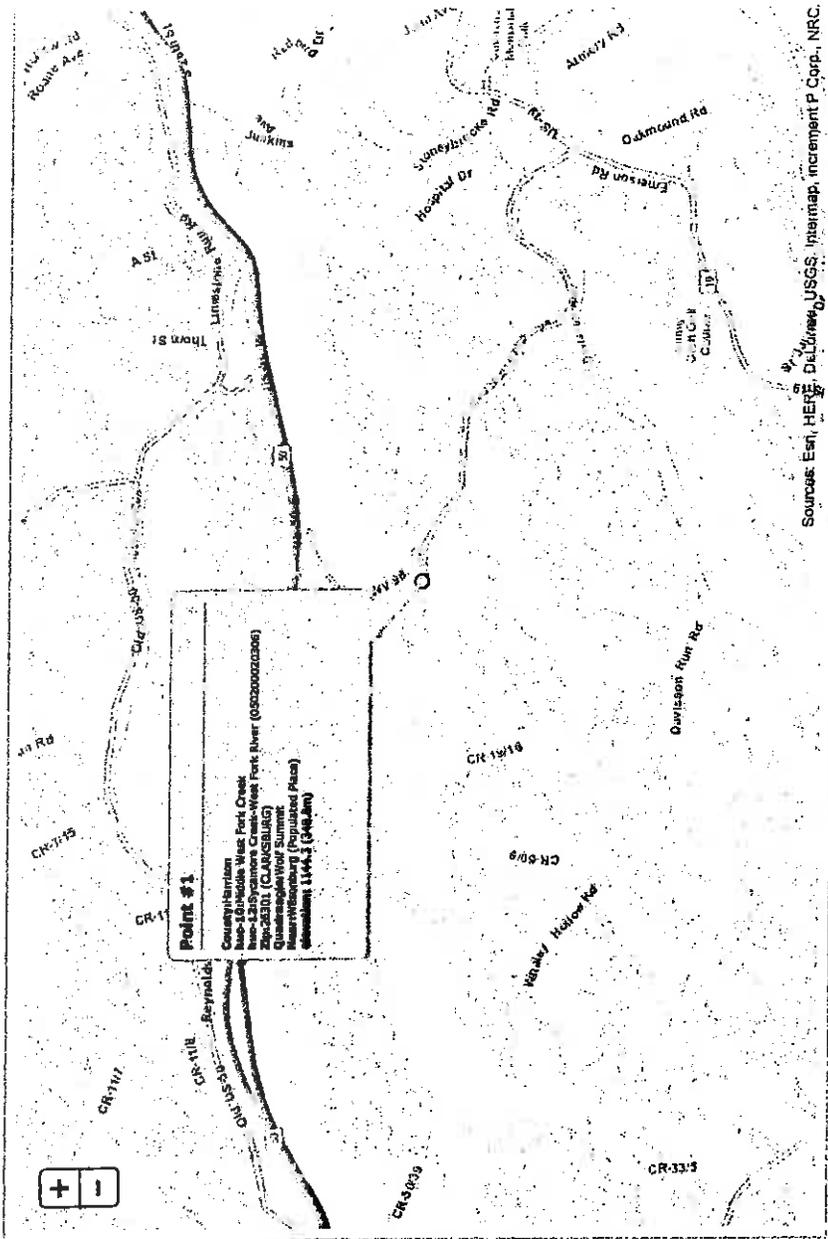
history view with basic data

1,39,278600,40,403600,LL,WGS84(G1150),551424.9,4347640.4,UTM17N,NAD83(CORSS83)

notes about datum conversions

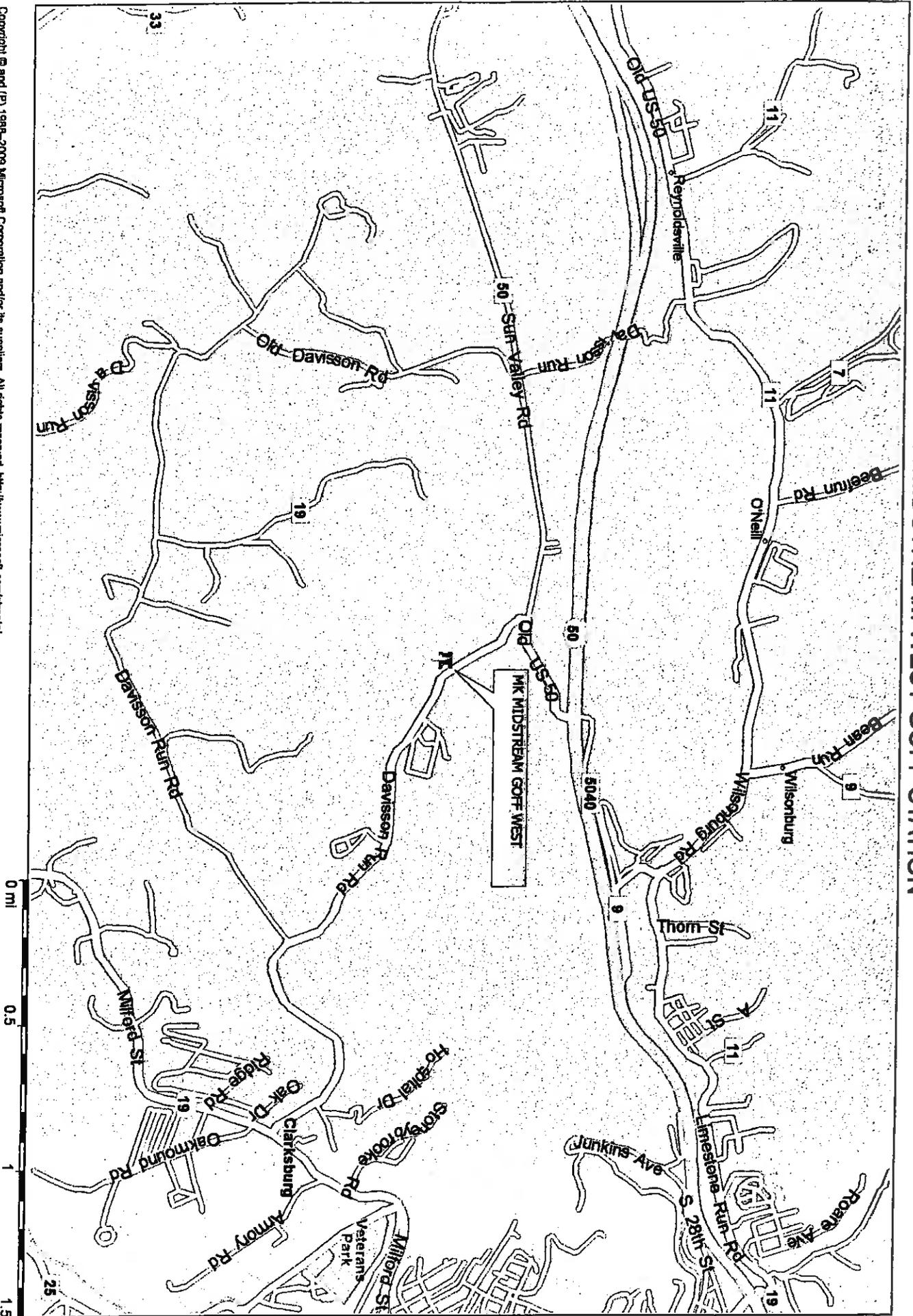
Datum conversions between all realizations of NAD27, NAD83, and WGS84 are not perfect, or sometimes not strictly perfect. Many of the issues are associated with the inability to convert between the original realization of NAD83 and more recent realizations. While error could be reduced by introducing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

© 2008 National Instruments. All rights reserved. This document is for internal use only. NAD27 and WGS84 are not perfect, or sometimes not strictly perfect. 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 case, which significantly increases the complexity of the application. Therefore datum conversions include a few built-in assumptions.



Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRC.

MK MIDSTREAM WEST GOLF STATION



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Certain mapping and direction data © 2009 NAVTEC. All rights reserved. The Data for areas of Canada includes information taken with permission from Canadian authorities, including © Her Majesty the Queen in Right of Canada, © Queen's Printer for Ontario. NAVTEC and NAVTEQ ON BOARD are trademarks of NAVTEC. © 2009 Tele Atlas North America, Inc. All rights reserved. Tele Atlas and Tele Atlas North America are trademarks of Tele Atlas, Inc. © 2009 by Applied Geographic Systems. All rights reserved.

**General Permit G35-A Registration
Section Applicability Form**

General Permit G35-A was developed to allow qualified registrants to seek registration for a variety of sources. These sources include internal combustion engines, boilers, reboilers, line heaters, tanks, emergency generators, dehydration units not subject to MACT standards, dehydration units not subject to MACT standards and being controlled by a flare control device, dehydration units not subject to MACT standards and being controlled by recycling the dehydration unit back to flame zone of reboiler, dehydration units not subject to MACT standards being controlled by a thermal oxidizer, and permit exemptions including the less than 1 ton/year benzene exemption, the 40CFR63 Subpart HH - Annual Average Flow of Gas Exemption (3 mmscf/day), and the 40CFR63 Subpart HHH - Annual Average Flow of Gas Exemption (10 mmscf/day). All registered facilities will be subject to Sections 1.0, 1.1, 2.0, 3.0, and 4.0.

General Permit G35-A allows the registrant to choose which sections of the permit that they wish to seek registration under. Therefore, please mark which sections that you are applying for registration under. Please keep in mind, that if this registration is approved, the issued registration will state which sections will apply to your affected facility.

- | | | |
|------------|---|-------------------------------------|
| Section 5 | Reciprocating Internal Combustion Engines (R.I.C.E.)* | <input checked="" type="checkbox"/> |
| Section 6 | Boilers, Reboilers, and Line Heaters | <input checked="" type="checkbox"/> |
| Section 7 | Tanks | <input checked="" type="checkbox"/> |
| Section 8 | Emergency Generators | <input type="checkbox"/> |
| Section 9 | Dehydration Units Not Subject to MACT Standards | <input checked="" type="checkbox"/> |
| Section 10 | Dehydration Units Not Subject to MACT Standards and being controlled by a flare control device | <input type="checkbox"/> |
| Section 11 | Dehydration Units Not Subject to MACT Standards being controlled by recycling the dehydration unit back to the flame zone of the reboiler | <input type="checkbox"/> |
| Section 12 | Dehydration Units Not Subject to MACT Standards and being controlled by a thermal oxidizer | <input type="checkbox"/> |
| Section 13 | Permit Exemption (Less than 1 ton/year of benzene exemption) | <input checked="" type="checkbox"/> |
| Section 14 | Permit Exemption (40CFR63 Subpart HH – Annual average flow of gas exemption (3 mmscf/day)) | <input type="checkbox"/> |
| Section 15 | Permit Exemption (40CFR63 Subpart HHH – Annual average flow of gas exemption (10 mmscf/day)) | <input type="checkbox"/> |
| Section 16 | Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (40CFR60 Subpart JJJJ) | <input checked="" type="checkbox"/> |

* Affected facilities that are subject to Section 5 may also be subject to Section 16. Therefore, if the applicant is seeking registration under both sections, please select both.

NATURAL GAS COMPRESSOR/GENERATOR ENGINE DATA SHEET

Source Identification Number ¹		CE-1R		CE-2R		CE-3R	
Engine Manufacturer and Model		CAT G3516B		CAT G3516B		CAT G3516B	
Manufacturer's Rated bhp/rpm		1380 / 1400		1380 / 1400		1380 / 1400	
Source Status ²		ES		RS		NS	
Date Installed/Modified/Removed ³		2011		2011		2015	
Engine Manufactured/Reconstruction Date ⁴		AFTER 2010		AFTER 2010		AFTER 2010	
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart JJJJ? (Yes or No) ⁵		YES		YES		YES	
Engine, Fuel and Combustion Data	Engine Type ⁶	LB4S		LB4S		LB4S	
	APCD Type ⁷	SCR		SCR		SCR	
	Fuel Type ⁸	RG		RG		RG	
	H ₂ S (gr/100 scf)	0.25		.025		0.25	
	Operating bhp/rpm	1380/1400		1380/1400		1380 / 1400	
	BSFC (Btu/bhp-hr)	7301		7301		7301	
	Fuel throughput (ft ³ /hr)	9447		9447		9447	
	Fuel throughput (MMft ³ /yr)	82.75		82.75		82.75	
	Operation (hrs/yr)	8760		8760		8760	
Reference ⁹	Potential Emissions ¹⁰	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
MD	NO _x	1.52	6.66	1.52	6.66	1.52	6.66
MD	CO	0.52	2.27	0.52	2.27	0.52	2.27
MD	VOC	0.73	3.20	0.73	3.20	0.73	3.20
OT	SO ₂	0.007	0.03	0.007	0.03	0.007	0.03
AP	PM ₁₀	0.10	0.44	0.10	0.44	0.10	0.44
	Formaldehyde	0.32	1.41	0.32	1.41	0.32	1.41

1. Enter the appropriate Source Identification Number for each natural gas-fueled reciprocating internal combustion compressor/generator engine located at the compressor station. Multiple compressor engines should be designated CE-1, CE-2, CE-3 etc. Generator engines should be designated GE-1, GE-2, GE-3 etc. If more than three (3) engines exist, please use additional sheets.
2. Enter the Source Status using the following codes:

NS	Construction of New Source (installation)	ES	Existing Source
MS	Modification of Existing Source	RS	Removal of Source
3. Enter the date (or anticipated date) of the engine's installation (construction of source), modification or removal.

NATURAL GAS COMPRESSOR/GENERATOR ENGINE DATA SHEET

Source Identification Number ¹		CE-4R		CE-5R		CE-6R	
Engine Manufacturer and Model		CAT G3516B		CAT G3608TALE		CAT G3606TALE	
Manufacturer's Rated bhp/rpm		1380 / 1400		2370/1000		1775/1000	
Source Status ²		NS		NS		NS	
Date Installed/Modified/Removed ³		2015		2015		2015	
Engine Manufactured/Reconstruction Date ⁴		AFTER 2010		4/11/2011		12/12/2014	
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart JJJ? (Yes or No) ⁵		YES		YES		YES	
Engine, Fuel and Combustion Data	Engine Type ⁶	LB4S		LB4S		LB4S	
	APCD Type ⁷	SCR		SCR		SCR	
	Fuel Type ⁸	RG		RG		RG	
	H ₂ S (gr/100 scf)	0.25		.025		0.25	
	Operating bhp/rpm	1380/1400		2370/1000		1775/1000	
	BSFC (Btu/bhp-hr)	7301		7589		7611	
	Fuel throughput (ft ³ /hr)	9447		17300		13000	
	Fuel throughput (MMft ³ /yr)	82.75		151.5		113.9	
Operation (hrs/yr)	8760		8760		8760		
Reference ⁹	Potential Emissions ¹⁰	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
MD	NO _x	1.52	6.66	2.61	11.44	1.96	8.57
MD	CO	0.52	2.27	1.0	4.39	0.75	3.29
MD	VOC	0.73	3.20	1.65	7.21	1.23	5.40
OT	SO ₂	0.007	0.03	0.01	0.05	0.008	0.035
AP	PM ₁₀	0.10	0.44	0.178	0.78	0.13	0.58
	Formaldehyde	0.32	1.41	0.68	2.98	0.51	2.23

1. Enter the appropriate Source Identification Number for each natural gas-fueled reciprocating internal combustion compressor/generator engine located at the compressor station. Multiple compressor engines should be designated CE-1, CE-2, CE-3 etc. Generator engines should be designated GE-1, GE-2, GE-3 etc. If more than three (3) engines exist, please use additional sheets.
2. Enter the Source Status using the following codes:
 NS Construction of New Source (installation) ES Existing Source
 MS Modification of Existing Source RS Removal of Source
3. Enter the date (or anticipated date) of the engine's installation (construction of source), modification or removal.

Source ID # ¹	Status ²	Design Heat Input (mmBtu/hr) ³	Hours of Operation (hrs/yr) ⁴	Fuel Heating Value (Btu/scf) ⁵	
NONE					

1. Enter the appropriate Source Identification Numbers (Source ID #) for each boiler or line heater located at the compressor station. Boilers should be designated BLR-1, BLR-2, BLR-3, etc. Heaters or Line Heaters should be designated HTR-1, HTR-2, HTR-3, etc. Enter glycol dehydration unit Reboiler Vent data on the *Glycol Dehydration Unit Data Sheet*.
2. Enter the Status for each boiler or line heater using the following:
 EXIST Existing Equipment
 REM Equipment Removed
 NEW Installation of New Equipment
3. Enter boiler or line heater design heat input in mmBtu/hr.
4. Enter the annual hours of operation in hours/year for each boiler or line heater.
5. Enter the fuel heating value in Btu/standard cubic foot.

STORAGE TANK DATA SHEET

Source ID # ¹	Status ²	Content ³	Volume ⁴	Dia ⁵	Throughput ⁶	Orientation ⁷	Liquid Height ⁸
T-1	EXIST	Used Oil, Water, condensate	100 bbl		6100 GPY		
T-2	EXIST	TEG & Oil Catch	210 gallon		~800 GPY		

1. Enter the appropriate Source Identification Numbers (Source ID #) for each storage tank located at the compressor station. Tanks should be designated T01, T02, T03, etc.
2. Enter storage tank Status using the following:
 EXIST Existing Equipment
 REM Equipment Removed
 NEW Installation of New Equipment
3. Enter storage tank content such as condensate, pipeline liquids, glycol (DEG or TEG), lube oil, etc.
4. Enter storage tank volume in gallons.
5. Enter storage tank diameter in feet.
6. Enter storage tank throughput in gallons per year.
7. Enter storage tank orientation using the following:
 VERT Vertical Tank
 HORZ Horizontal Tank
8. Enter storage tank average liquid height in feet.

NATURAL GAS GLYCOL DEHYDRATION UNIT DATA SHEET

General Glycol Dehydration Unit Data		Manufacturer and Model		EXTERRAN	
		Max Dry Gas Flow Rate (mmscf/day)		45	
		Design Heat Input (mmBtu/hr)		1.0	
		Design Type (DEG or TEG)		TEG	
		Source Status ²		EXIST	
		Date Installed/Modified/Removed ³		2012	
		Regenerator Still Vent APCD ⁴		NA	
		Fuel HV (Btu/scf)		1020	
		H ₂ S Content (gr/100 scf)		<0.25	
		Operation (hrs/yr)		8760	
Source ID # ¹	Vent	Reference ⁵	Potential Emissions ⁶	lbs/hr	tons/yr
RBV-1	Reboiler Vent	AP	NO _x	0.1	0.43
		AP	CO	0.08	0.36
		AP	VOC	0.004	0.02
		AP	SO ₂	Na	Na
		AP	PM ₁₀	0.01	0.03
RSV-1	Glycol Regenerator Still Vent	GRI-GLYCalc™	VOC	0.21	0.89
		GRI-GLYCalc™	Benzene	NA	NA
		GRI-GLYCalc™	Ethylbenzene	NA	NA
		GRI-GLYCalc™	Toluene	NA	NA
		GRI-GLYCalc™	Xylenes	NA	NA
		GRI-GLYCalc™	n-Hexane	NA	NA

1. Enter the appropriate Source Identification Numbers for the glycol dehydration unit Reboiler Vent and glycol Regenerator Still Vent. The glycol dehydration unit Reboiler Vent and glycol Regenerator Still Vent should be designated RBV-1 and RSV-1, respectively. If the compressor station incorporates multiple glycol dehydration units, a *Glycol Dehydration Unit Data Sheet* shall be completed for each, using Source Identification #s RBV-2 and RSV-2, RBV-3 and RSV-3, etc.

2. Enter the Source Status using the following codes:

NS Construction of New Source	ES Existing Source
MS Modification of Existing Source	RS Removal of Source

3. Enter the date (or anticipated date) of the glycol dehydration unit's installation (construction of source), modification or removal.

4. Enter the Air Pollution Control Device (APCD) type designation using the following codes:

NA None	CD Condenser
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West Virginia Department of Environmental Protection

DIVISION OF AIR QUALITY : (304) 926-0475
WEB PAGE: <http://www.wvdep.org>

Division of Air Quality

40 CFR Part 63; Subpart HH & HHH Registration Form

Complete this form for any oil and natural gas production or natural gas transmission and storage facility that uses an affected unit under HH/HHH, whether subject or not.

Section A: Facility Description			
Affected facility actual annual average natural gas throughput (scf/day): EST 45.0 MMSCFD			
Affected facility actual annual average hydrocarbon liquid throughput: (bbl/day): NA			
The affected facility processes, upgrades, or stores hydrocarbon liquids prior to custody transfer.			Yes <u>No</u>
The affected facility processes, upgrades, or stores natural gas prior to the point at which natural gas (NG) enters the NG transmission and storage source category or is delivered to the end user.			Yes <u>No</u>
The affected facility is: <input type="checkbox"/> prior to a NG processing plant <input type="checkbox"/> a NG processing plant <input type="checkbox"/> prior to the point of custody transfer and there is no NG processing plant			
The affected facility transports or stores natural gas prior to entering the pipeline to a local distribution company or to a final end user (if there is no local distribution company).			Yes <u>No</u>
The affected facility exclusively processes, stores, or transfers black oil.			Yes <u>No</u>
Initial producing gas-to-oil ratio (GOR): _____ scf/bbl API gravity: _____ degrees			
Section B: Dehydration Unit (if applicable) ¹			
Description: TEG Dehydration Unit			
Date of Installation: 2012	Annual Operating Hours: 8760	Burner rating (MMBtu/hr): 1.0	
Exhaust Stack Height (ft): 12	Stack Diameter (ft): .75	Stack Temp. (°F): 212	
Glycol Type: <input checked="" type="checkbox"/> TEG <input type="checkbox"/> EG <input type="checkbox"/> Other:			
Glycol Pump Type: <input type="checkbox"/> Electric <input type="checkbox"/> Gas If gas, what is the volume ratio? 0.08 ACFM/gpm			
Condenser installed? <input type="checkbox"/> Yes <input type="checkbox"/> No Exit Temp. _____ °F Condenser Pressure _____ psig			
Incinerator/flare installed? <input type="checkbox"/> Yes <input type="checkbox"/> No Destruction Eff. _____ %			
Other controls installed? <input type="checkbox"/> Yes <input type="checkbox"/> No Describe:			
Wet Gas ² : Gas Temp.: -95 °F Gas Pressure 600 psig			
(Upstream of Contact Tower) Saturated Gas? <input type="checkbox"/> Yes <input type="checkbox"/> No If no, water content _____ lb/MMSCF			
Dry Gas: Gas Flowrate(MMSCFD) Actual _____ Design 45			
(Downstream of Contact Tower) Water Content 7.0 lb/MMSCF			
Lean Glycol: Circulation rate (gpm) Actual ³ 7.5 Maximum ⁴ _____			
Pump make/model: KIMRAY 45015PV			
Glycol Flash Tank (if applicable): Temp.: _____ °F Pressure _____ psig Vented? Yes <input type="checkbox"/> No <input type="checkbox"/>			
If no, describe vapor control:			
Stripping Gas (if applicable): Source of gas: _____ Rate _____ scfm			

Please attach the following required dehydration unit information:

1. System map indicating the chain of custody information. See Page 43 of this document for an example of a gas flow schematic. It is not intended that the applicant provide this level of detail for all sources. The level of detail that is necessary is to establish where the custody transfer points are located. This can be accomplished by submitting a process flow diagram indicating custody transfer points and the natural gas flow. However, the DAQ reserves the right to request more detailed information in order to make the necessary decisions.
2. Extended gas analysis from the Wet Gas Stream including mole percents of C₁-C₄, benzene, ethylbenzene, toluene, xylene and n-Hexane, using Gas Processors Association (GPA) 2286 (or similar). A sample should be taken from the inlet gas line, downstream from any inlet separator, and using a manifold to remove entrained liquids from the sample and a probe to collect the sample from the center of the gas line. GPA standard 2166 reference method or a modified version of EPA Method TO-14, (or similar) should be used.
3. GRI-GLYCalc Ver. 3.0 aggregate report based on maximum Lean Glycol circulation rate and maximum throughput.
4. Detailed calculations of gas or hydrocarbon flow rate.

Section C: Facility NESHAPS Subpart HH/HHH status

Affected facility status: (choose only one)	<input type="checkbox"/> Subject to Subpart HH
	<input type="checkbox"/> Subject to Subpart HHH
	<input checked="" type="checkbox"/> Not Subject
	because:
	<input checked="" type="checkbox"/> < 10/25 TPY
	<input type="checkbox"/> Affected facility exclusively handles black oil
	<input type="checkbox"/> The facility wide actual annual average NG throughput is < 650 thousand scf/day and facility wide actual annual average hydrocarbon liquid is < 250 bpd
	<input type="checkbox"/> No affected source is present

NATURAL GAS GLYCOL DEHYDRATION UNIT DATA SHEET

General Glycol Dehydration Unit Data		Manufacturer and Model		EXTERRAN	
		Max Dry Gas Flow Rate (mmscf/day)		45	
		Design Heat Input (mmBtu/hr)		1.0	
		Design Type (DEG or TEG)		TEG	
		Source Status ²		EXIST	
		Date Installed/Modified/Removed ³		2012	
		Regenerator Still Vent APCD ⁴		NA	
		Fuel HV (Btu/scf)		1020	
		H ₂ S Content (gr/100 scf)		<0.25	
		Operation (hrs/yr)		8760	
Source ID # ¹	Vent	Reference ⁵	Potential Emissions ⁶	lbs/hr	tons/yr
RBV-2	Reboiler Vent	AP	NO _x	0.1	0.43
		AP	CO	0.08	0.36
		AP	VOC	0.004	0.02
		AP	SO ₂	Na	Na
		AP	PM ₁₀	0.01	0.03
RSV-2	Glycol Regenerator Still Vent	GRI-GLYCalc™	VOC	0.21	0.89
		GRI-GLYCalc™	Benzene	NA	NA
		GRI-GLYCalc™	Ethylbenzene	NA	NA
		GRI-GLYCalc™	Toluene	NA	NA
		GRI-GLYCalc™	Xylenes	NA	NA
		GRI-GLYCalc™	n-Hexane	NA	NA

1. Enter the appropriate Source Identification Numbers for the glycol dehydration unit Reboiler Vent and glycol Regenerator Still Vent. The glycol dehydration unit Reboiler Vent and glycol Regenerator Still Vent should be designated RBV-1 and RSV-1, respectively. If the compressor station incorporates multiple glycol dehydration units, a *Glycol Dehydration Unit Data Sheet* shall be completed for each, using Source Identification #s RBV-2 and RSV-2, RBV-3 and RSV-3, etc.
2. Enter the Source Status using the following codes:

NS	Construction of New Source	ES	Existing Source
MS	Modification of Existing Source	RS	Removal of Source
3. Enter the date (or anticipated date) of the glycol dehydration unit's installation (construction of source), modification or removal.
4. Enter the Air Pollution Control Device (APCD) type designation using the following codes:

NA	None	CD	Condenser
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West Virginia Department of Environmental Protection

DIVISION OF AIR QUALITY : (304) 926-0475

Division of Air Quality

WEB PAGE: <http://www.wvdep.org>

40 CFR Part 63; Subpart HH & HHH Registration Form

Complete this form for any oil and natural gas production or natural gas transmission and storage facility that uses an affected unit under HH/HHH, whether subject or not.

Section A: Facility Description			
Affected facility actual annual average natural gas throughput (scf/day): EST 45.0 MMSCFD			
Affected facility actual annual average hydrocarbon liquid throughput: (bbl/day): NA			
The affected facility processes, upgrades, or stores hydrocarbon liquids prior to custody transfer.	Yes	No	
The affected facility processes, upgrades, or stores natural gas prior to the point at which natural gas (NG) enters the NG transmission and storage source category or is delivered to the end user.	Yes	No	
The affected facility is: <input type="checkbox"/> prior to a NG processing plant <input type="checkbox"/> a NG processing plant <input type="checkbox"/> prior to the point of custody transfer and there is no NG processing plant			
The affected facility transports or stores natural gas prior to entering the pipeline to a local distribution company or to a final end user (if there is no local distribution company).	Yes	No	
The affected facility exclusively processes, stores, or transfers black oil.	Yes	No	
Initial producing gas-to-oil ratio (GOR): _____ scf/bbl API gravity: _____ degrees			
Section B: Dehydration Unit (if applicable) ¹			
Description: TEG Dehydration Unit			
Date of Installation: 2012	Annual Operating Hours: 8760	Burner rating (MMbtu/hr): 1.0	
Exhaust Stack Height (ft): 12	Stack Diameter (ft): .75	Stack Temp. (°F): 212	
Glycol Type: <input checked="" type="checkbox"/> TEG <input type="checkbox"/> EG <input type="checkbox"/> Other:			
Glycol Pump Type: <input type="checkbox"/> Electric <input type="checkbox"/> Gas	If gas, what is the volume ratio? 0.08 ACFM/gpm		
Condenser installed? <input type="checkbox"/> Yes <input type="checkbox"/> No	Exit Temp. _____ °F	Condenser Pressure _____ psig	
Incinerator/flare installed? <input type="checkbox"/> Yes <input type="checkbox"/> No	Destruction Eff. _____ %		
Other controls installed? <input type="checkbox"/> Yes <input type="checkbox"/> No Describe:			
Wet Gas ² : Gas Temp.: ~95 °F Gas Pressure 600 psig			
(Upstream of Contact Tower)	Saturated Gas? <input type="checkbox"/> Yes <input type="checkbox"/> No	If no, water content _____ lb/MMSCF	
Dry Gas: Gas Flowrate(MMSCFD) Actual _____ Design 45			
(Downstream of Contact Tower)	Water Content 7.0 lb/MMSCF		
Lean Glycol: Circulation rate (gpm) Actual ³ 7.5 Maximum ⁴ _____			
Pump make/model: KIMRAY 45015PV			
Glycol Flash Tank (if applicable): Temp.: _____ °F Pressure _____ psig Vented? Yes <input type="checkbox"/> No <input type="checkbox"/>			
If no, describe vapor control:			
Stripping Gas (if applicable): Source of gas: _____ Rate _____ scfm			

Please attach the following required dehydration unit information:

1. System map indicating the chain of custody information. See Page 43 of this document for an example of a gas flow schematic. It is not intended that the applicant provide this level of detail for all sources. The level of detail that is necessary is to establish where the custody transfer points are located. This can be accomplished by submitting a process flow diagram indicating custody transfer points and the natural gas flow. However, the DAQ reserves the right to request more detailed information in order to make the necessary decisions.
2. Extended gas analysis from the Wet Gas Stream including mole percents of C₁-C₆, benzene, ethylbenzene, toluene, xylene and n-Hexane, using Gas Processors Association (GPA) 2286 (or similar). A sample should be taken from the inlet gas line, downstream from any inlet separator, and using a manifold to remove entrained liquids from the sample and a probe to collect the sample from the center of the gas line. GPA standard 2166 reference method or a modified version of EPA Method TO-14, (or similar) should be used.
3. GRI-GLYCalc Ver. 3.0 aggregate report based on maximum Lean Glycol circulation rate and maximum throughput.
4. Detailed calculations of gas or hydrocarbon flow rate.

Section C: Facility NESHAPS Subpart HH/HHH status

	<input type="checkbox"/> Subject to Subpart HH	
Affected facility	<input type="checkbox"/> Subject to Subpart HHH	
status:	<input checked="" type="checkbox"/> Not Subject	<input checked="" type="checkbox"/> < 10/25 TPY
(choose only one)	because:	<input type="checkbox"/> Affected facility exclusively handles black oil <input type="checkbox"/> The facility wide actual annual average NG throughput is < 650 thousand scf/day and facility wide actual annual average hydrocarbon liquid is < 250 bpd <input type="checkbox"/> No affected source is present

COMPRESSOR STATION EMISSION SUMMARY SHEET FOR CRITERIA POLLUTANTS

GOFF WEST Compressor Station		Registration Number (Agency Use) <u>G35-A107A</u>													
Source ID No.	Potential Emissions (lbs/hr)										Potential Emissions (tons/yr)				
	NO _x	CO	VOC	SO ₂	PM ₁₀	NO _x	CO	VOC	SO ₂	PM ₁₀	NO _x	CO	VOC	SO ₂	PM ₁₀
CE-1R	1.52	0.52	0.73	0.007	0.10	6.66	2.27	3.20	0.03	0.44	6.66	2.27	3.20	0.03	0.44
CE-2R	1.52	0.52	0.73	0.007	0.10	6.66	2.27	3.20	0.03	0.44	6.66	2.27	3.20	0.03	0.44
CE-3R	1.52	0.52	0.73	0.007	0.10	6.66	2.27	3.20	0.03	0.44	6.66	2.27	3.20	0.03	0.44
CE-4R	1.52	0.52	0.73	0.007	0.10	6.66	2.27	3.20	0.03	0.44	6.66	2.27	3.20	0.03	0.44
CE-5R	2.61	1.0	1.65	0.01	0.178	11.44	4.39	7.21	0.05	0.78	11.44	4.39	7.21	0.05	0.78
CE-6R	1.96	0.75	1.23	0.008	0.13	8.57	3.29	5.40	0.035	0.58	8.57	3.29	5.40	0.035	0.58
RBV-1	0.10	0.08	0.004	NA	0.01	0.43	0.36	0.02	NA	0.03	0.43	0.36	0.02	NA	0.03
RSV-1	NA	NA	0.20	NA	NA	NA	NA	0.88	NA	NA	NA	NA	0.88	NA	NA
RBV-2	0.10	0.08	0.004	NA	0.01	0.43	0.36	0.02	NA	0.03	0.43	0.36	0.02	NA	0.03
RSV-2	NA	NA	0.21	NA	NA	NA	NA	0.89	NA	NA	NA	NA	0.89	NA	NA
TK-1	NA	NA	0.02	NA	NA	NA	NA	0.10	NA	NA	NA	NA	0.10	NA	NA
TK-2	NA	NA	<0.01	NA	NA	NA	NA	0.02	NA	NA	NA	NA	0.02	NA	NA
Total	10.85	3.99	6.24	0.046	0.73	47.51	17.48	27.34	0.205	3.18	47.51	17.48	27.34	0.205	3.18

COMPRESSOR STATION EMISSION SUMMARY SHEET FOR HAZARDOUS/TOXIC POLLUTANTS

Goff West Compressor Station											Registration Number (Agency Use) <u>G35-A107A</u>							
Source ID No.	Potential Emissions (lbs/hr)										Potential Emissions (tons/yr)							
	Benzene	Ethyl-benzene	Toluene	Xylenes	n-Hexane	Formaldehyde	Benzene	Ethyl-benzene	Toluene	Xylenes	n-Hexane	Formaldehyde	Benzene	Ethyl-benzene	Toluene	Xylenes	n-Hexane	Formaldehyde
CE-1R						0.32					0.32							1.41
CE-2R						0.32					0.32							1.41
CE-3R						0.32					0.32							1.41
CE-4R						0.32					0.32							1.41
CE-5R						0.68					0.68							2.98
CE-6R						0.51					0.51							2.23
RBV-1						NA					NA							NA
RSV-1						NA					NA							NA
RBV-2						NA					NA							NA
RSV-2						NA					NA							NA
TK-1						0.002					0.002							0.01
TK-2						NA					NA							NA
Total						2.472					2.472							10.86

General Permit Levels
Construction, Modification, Relocation, Administrative Update

ATTACHMENT I – EMISSION CALCULATIONS

Date: February 16, 2015

Owner of Source: MK Midstream Holdings, LLC. Site: Goff West Compressor Station

County: Harrison

Latitude/Longitude: 39.2766 N / 80.4038 W

Mass Emission Calculations for a Natural Gas Engine Stationary Source (CE-1R-4R)

Make Caterpillar Model G3516B BHP 1380 RPM 1400

Engine Build Date (EBD) All After 1/1/2010 NSPS Applicable SN# JEF???

Emission Controls:

Catalyst (Y/N) Y Make DCL Model DC-65

Cycle and Burn (4SLB, 4SRB, 2SLB, 2SRB) 4SLB

Fuel /Heat Input (BTU/bhp-hr) 7301 BTU/scf 1017 SCF/hr 10,049

Heat Input (MMBTU/hr) 10.01

EPA AP-42 Uncontrolled Emission Factors for 4SLB from Table 3.2-2

Pollutant	grams/bhp-hr (lb/MMBTU)	lb/hr g *BHP/453.5924	Ton/Year lb/hr*8760/2000	Method OEM/AP-42
NOx	0.50	1.52	6.66	OEM
CO	0.17	0.52	2.27	OEM
VOC	0.24	0.73	3.20	OEM
HCHO	0.105	0.32	1.41	OEM
PM(10)	0.0317 (9.91E-03)	0.10	0.44	AP-42
SOx	0.002 (5.88E-04)	0.007	0.03	AP-42
CO2(e) GHG CH4	NA	NA	6313 Tons 253 Tons	EPA Website

Totals within General Permit Registration are for CE-1R, 2R, 3R & 4R x 4 engines

ATTACHMENT I – EMISSION CALCULATIONS

Date: September 15, 2015

Owner of Source: MK Midstream Holdings, LLC. Site: Goff West Compressor Station

County: Harrison

Latitude/Longitude: 39.2766 N / 80.4038 W

Mass Emission Calculations for a Natural Gas Engine Stationary Source (CE-5R)

Make Caterpillar Model G3608TALE BHP 2370 RPM 1000

Engine Build Date (EBD) 4/11/2011 NSPS Applicable SN# BEN00694

Emission Controls:

Catalyst (Y/N) Y Make EMIT Model ELX6200Z-2022F-63CEO-362

Cycle and Burn (4SLB, 4SRB, 2SLB, 2SRB) 4SLB

Fuel /Heat Input (BTU/bhp-hr) 7589 BTU/scf 1040 SCF/hr 17,300

Heat Input (MMBTU/hr) 17.98

EPA AP-42 Uncontrolled Emission Factors for 4SLB from Table 3.2-2

Pollutant Catalyst Eff (%)	grams/bhp-hr (lb/MMBTU)	lb/hr g *BHP/453.5924	Ton/Year lb/hr*8760/2000	Method OEM/AP-42
NOx	0.50	2.61	11.44	OEM/LE
CO(93%)	0.19	1.00	4.39	OEM/DCL
VOC(50%)	0.32	1.65	7.21	OEM/DCL
HCHO(50%)	0.13	0.68	2.98	OEM/DCL
PM(10)	0.033 (9.91E-03)	0.178	0.78	AP-42
SOx	0.002 (5.88E-04)	0.01	0.05	AP-42
CO2(e) GHG CH4	NA	2299 28	9133 Tons 111 Tons	EPA Website USA Vendor

Totals within General Permit Registration are for CE-5R engine

ATTACHMENT I – EMISSION CALCULATIONS

Date: September 15, 2015

Owner of Source: MK Midstream Holdings, LLC. Site: Goff West Compressor Station

County: Harrison

Latitude/Longitude: 39.2766 N / 80.4038 W

Mass Emission Calculations for a Natural Gas Engine Stationary Source (CE-6R)

Make Caterpillar Model G3606TALE BHP 1775 RPM 1000

Engine Build Date (EBD) 12/12/2014 NSPS Applicable SN# 4ZS02061

Emission Controls:

Catalyst (Y/N) Y Make DCL Model DC64L2-18/20 HGS+

Cycle and Burn (4SLB, 4SRB, 2SLB, 2SRB) 4SLB

Fuel /Heat Input (BTU/bhp-hr) 7611 BTU/scf 1040 SCF/hr 13,000

Heat Input (MMBTU/hr) 13.51

EPA AP-42 Uncontrolled Emission Factors for 4SLB from Table 3.2-2

Pollutant Catalyst Eff (%)	grams/bhp-hr (lb/MMBTU)	lb/hr g *BHP/453.5924	Ton/Year lb/hr*8760/2000	Method OEM/AP-42
NO _x	0.50	1.96	8.57	OEM/LE
CO (93%)	0.19	0.75	3.29	OEM/DCL
VOC(50%)	0.32	1.23	5.40	OEM/DCL
HCHO(50%)	0.13	0.51	2.23	OEM/DCL
PM(10)	0.033 (9.91E-03)	0.13	0.58	AP-42
SO _x	0.002 (5.88E-04)	0.008	0.035	AP-42
CO ₂ (e) GHG CH ₄	NA	1726 10.4	6856 Tons 41 Tons	EPA Website USA Vendor

Totals within General Permit Registration are for CE-6R engine

ATTACHMENT I

MK MIDSTREAM HOLDINGS, LLC – GOFF WEST DEHYS

RVB-1 & RSV-1 / RVB -2 & RSV -2 YTD = 45.0 MMSCFD/each)

TEG Dehydrators are Identical in size, each can potentially see approximately 45.00 MMSCFD of volume @ 600 psig

**GRI-Glycalc Ver 4.0 emission software from OEM
(Model 1000) = 1,000,000 BTU-Hr ReBoiler**

1,000,000 BTU/hr = 1.0 MMBTU/hr x 2 TEG

EPA AP-42 Table 1.4-1

VOC = See GRI-GLYcalc performance 0.21 lbs/hr = 0.89 Tons/year

Pollutant	(lb/10⁶scf)	lb/hr	Ton/Year	Method AP-42
NOx	100	0.10	0.43	Fire-Tube
CO	84	0.08	0.36	Fire-Tube
VOC RSV		0.21	0.89	GlyCalc 4.0
VOC RBV	5.5	0.004	0.02	AP-42
HCHO	Nil	Nil	Nil	AP-42
PM(10)	7.6	0.01	0.03	AP-42
SOx	Nil	NA	NA	AP-42
CO2(e)	EPA web	NA	1422	EPA Website
CH4			56.88	

ATTACHMENT I

MK MIDSTREAM HOLDINGS, LLC – GOFF WEST DEHYS

Tanks 1 & 2

Tank 1 (TK-1) 100 bbl installed 2011 – Used Oil, Water, Condensate Storage Tank

Pollutant	E& P Tanks	lb/hr	Ton/Year	E& P Tanks
NOx	NA	NA	NA	EP
CO	NA	NA	NA	EP
VOC RSV VOC RBV	See EP software	.02	0.10	EP
HAP	See EP software	NA	0.01	EP
PM(10)	NA	NA	NA	EP
SOx	NA	NA	NA	EP
CO2(e) CH4	NA	NA	NA	NA

ATTACHMENT I

MK MIDSTREAM HOLDINGS, LLC – GOFF WEST DEHYS

Tanks 1 & 2

Tank 2 (TK-2) 210 gallons installed 2011 – TEG & Oil Catch Tank

Pollutant	E& P Tanks	lb/hr	Ton/Year	E& P Tanks
NOx	NA	NA	NA	EP
CO	NA	NA	NA	EP
VOC RSV VOC RBV	See EP software	<0.01	0.02	EP
HAP	See EP software	NA	NA	EP
PM(10)	NA	NA	NA	EP
SOx	NA	NA	NA	EP
CO2(e) CH4	NA	NA	NA	NA

MK Midstream Goff West Aggregate RSVRBV-1

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: MK Midstream Goff West RSV-1 & RBV -1
 File Name:
 Date: February 20, 2015

DESCRIPTION:

Description: Two (2) 1.0 MMBTU/hr reboilers, each possible of 45 MMCFD

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	55.5630	1333.512	243.3659
Ethane	2.6508	63.620	11.6106
Propane	0.1768	4.243	0.7743
Isobutane	0.0067	0.161	0.0294
n-Butane	0.0175	0.419	0.0765
Total Emissions	58.4148	1401.954	255.8566
Total Hydrocarbon Emissions	58.4148	1401.954	255.8566
Total VOC Emissions	0.2010	4.823	0.8802

EQUIPMENT REPORTS:

ABSORBER

NOTE: Because the Calculated Absorber Stages was below the minimum allowed, GRI-GLYCalc has set the number of Absorber Stages to 1.25 and has calculated a revised Dry Gas Dew Point.

Calculated Absorber Stages: 1.25
 Calculated Dry Gas Dew Point: 5.14 lbs. H2O/MMSCF

Temperature: 93.0 deg. F
 Pressure: 600.0 psig
 Dry Gas Flow Rate: 45.0000 MMSCF/day
 Glycol Losses with Dry Gas: 0.2082 lb/hr
 Wet Gas Water Content: Saturated
 Calculated Wet Gas Water Content: 69.81 lbs. H2O/MMSCF
 Specified Lean Glycol Recirc. Ratio: 3.00 gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	7.35%	92.65%
Carbon Dioxide	99.87%	0.13%
Nitrogen	99.99%	0.01%
Methane	99.99%	0.01%
Ethane	99.97%	0.03%

MK Midstream Goff West Aggregate RSVRBV-1		
Propane	99.94%	0.06%
Isobutane	99.92%	0.08%
n-Butane	99.89%	0.11%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	29.04%	70.96%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%

STREAM REPORTS:

WET GAS STREAM

Temperature: 93.00 deg. F
 Pressure: 614.70 psia
 Flow Rate: 1.88e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.47e-001	1.31e+002
Carbon Dioxide	4.11e-001	8.95e+002
Nitrogen	3.39e-001	4.70e+002
Methane	9.71e+001	7.71e+004
Ethane	1.91e+000	2.84e+003
Propane	6.79e-002	1.48e+002
Isobutane	1.60e-003	4.60e+000
n-Butane	3.50e-003	1.01e+001
Total Components	100.00	8.16e+004

DRY GAS STREAM

Temperature: 93.00 deg. F
 Pressure: 614.70 psia
 Flow Rate: 1.88e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.08e-002	9.64e+000
Carbon Dioxide	4.11e-001	8.94e+002
Nitrogen	3.40e-001	4.70e+002
Methane	9.73e+001	7.71e+004
Ethane	1.91e+000	2.84e+003
Propane	6.80e-002	1.48e+002
Isobutane	1.60e-003	4.59e+000

MK Midstream Goff West Aggregate RSVRBV-1
n-Butane 3.50e-003 1.00e+001

Total Components 100.00 8.15e+004

LEAN GLYCOL STREAM

Temperature: 93.00 deg. F
Flow Rate: 5.89e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.85e+001	3.27e+003
Water	1.50e+000	4.97e+001
Carbon Dioxide	3.44e-012	1.14e-010
Nitrogen	1.26e-013	4.18e-012
Methane	6.58e-018	2.18e-016
Ethane	1.20e-008	3.98e-007
Propane	1.01e-010	3.36e-009
Isobutane	3.43e-012	1.14e-010
n-Butane	8.27e-012	2.74e-010
Total Components	100.00	3.32e+003

RICH GLYCOL AND PUMP GAS STREAM

Temperature: 93.00 deg. F
Pressure: 614.70 psia
Flow Rate: 6.26e+000 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.34e+001	3.26e+003
Water	4.90e+000	1.71e+002
Carbon Dioxide	4.89e-002	1.71e+000
Nitrogen	9.75e-003	3.41e-001
Methane	1.59e+000	5.56e+001
Ethane	7.58e-002	2.65e+000
Propane	5.06e-003	1.77e-001
Isobutane	1.92e-004	6.72e-003
n-Butane	4.99e-004	1.75e-002
Total Components	100.00	3.50e+003

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 3.93e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.52e+001	1.22e+002
Carbon Dioxide	3.75e-001	1.71e+000
Nitrogen	1.18e-001	3.41e-001
Methane	3.34e+001	5.56e+001
Ethane	8.51e-001	2.65e+000
Propane	3.87e-002	1.77e-001
Isobutane	1.12e-003	6.72e-003
n-Butane	2.90e-003	1.75e-002

MK Midstream Goff west Aggregate RSVRBV-1

Total Components 100.00 1.82e+002

MK Midstream Goff West RSVRBV-1

GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: MK Midstream Goff West RSV-1 & RBV -1
File Name:
Date: February 20, 2015

DESCRIPTION:

Description: Two (2) 1.0 MMBTU/hr reboilers, each possible of 45 MMCFD

Annual Hours of operation: 8760.0 hours/yr

WET GAS:

Temperature: 93.00 deg. F
Pressure: 600.00 psig
Wet Gas Water Content: Saturated

Component	Conc. (vol %)
Carbon Dioxide	0.4113
Nitrogen	0.3397
Methane	97.2515
Ethane	1.9121
Propane	0.0680
Isobutane	0.0016
n-Butane	0.0035

DRY GAS:

Flow Rate: 45.0 MMSCF/day
Water Content: 7.0 lbs. H2O/MMSCF

LEAN GLYCOL:

Glycol Type: TEG
Water Content: 1.5 wt% H2O
Recirculation Ratio: 3.0 gal/lb H2O

PUMP:

Glycol Pump Type: Gas Injection
Gas Injection Pump Volume Ratio: 0.080 acfm gas/gpm glycol

MK Midstream Goff West Aggregate RSVRBV-2

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: MK Midstream Goff West RSV-2 & RBV -2
 File Name:
 Date: February 20, 2015

DESCRIPTION:

Description: Two (2) 1.0 MMBTU/hr reboilers, each possible of 45 MMCFD

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	56.4331	1354.395	247.1771
Ethane	2.6918	64.604	11.7902
Propane	0.1794	4.306	0.7859
Isobutane	0.0068	0.163	0.0298
n-Butane	0.0177	0.425	0.0775
Total Emissions	59.3289	1423.894	259.8606
Total Hydrocarbon Emissions	59.3289	1423.894	259.8606
Total VOC Emissions	0.2039	4.894	0.8932

EQUIPMENT REPORTS:

ABSORBER

NOTE: Because the Calculated Absorber Stages was below the minimum allowed, GRI-GLYCalc has set the number of Absorber Stages to 1.25 and has calculated a revised Dry Gas Dew Point.

Calculated Absorber Stages: 1.25
 Calculated Dry Gas Dew Point: 5.22 lbs. H2O/MMSCF
 Temperature: 93.5 deg. F
 Pressure: 600.0 psig
 Dry Gas Flow Rate: 45.0000 MMSCF/day
 Glycol Losses with Dry Gas: 0.2133 lb/hr
 Wet Gas Water Content: Saturated
 Calculated Wet Gas Water Content: 70.87 lbs. H2O/MMSCF
 Specified Lean Glycol Recirc. Ratio: 3.00 gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	7.35%	92.65%
Carbon Dioxide	99.87%	0.13%
Nitrogen	99.99%	0.01%
Methane	99.99%	0.01%
Ethane	99.97%	0.03%

MK Midstream Goff West Aggregate RSVRBV-2
 Propane 99.94% 0.06%
 Isobutane 99.92% 0.08%
 n-Butane 99.89% 0.11%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled overhead
Water	29.07%	70.93%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%

STREAM REPORTS:

WET GAS STREAM

Temperature: 93.50 deg. F
 Pressure: 614.70 psia
 Flow Rate: 1.88e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.49e-001	1.33e+002
Carbon Dioxide	4.11e-001	8.95e+002
Nitrogen	3.39e-001	4.70e+002
Methane	9.71e+001	7.71e+004
Ethane	1.91e+000	2.84e+003
Propane	6.79e-002	1.48e+002
Isobutane	1.60e-003	4.60e+000
n-Butane	3.50e-003	1.01e+001
Total Components	100.00	8.16e+004

DRY GAS STREAM

Temperature: 93.50 deg. F
 Pressure: 614.70 psia
 Flow Rate: 1.88e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.10e-002	9.79e+000
Carbon Dioxide	4.11e-001	8.94e+002
Nitrogen	3.40e-001	4.70e+002
Methane	9.73e+001	7.71e+004
Ethane	1.91e+000	2.84e+003
Propane	6.80e-002	1.48e+002
Isobutane	1.60e-003	4.59e+000

MK Midstream Goff West Aggregate RSVRBV-2
 n-Butane 3.50e-003 1.00e+001

 Total Components 100.00 8.15e+004

LEAN GLYCOL STREAM

 Temperature: 93.50 deg. F
 Flow Rate: 5.99e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.85e+001	3.32e+003
Water	1.50e+000	5.06e+001
Carbon Dioxide	3.42e-012	1.15e-010
Nitrogen	1.26e-013	4.25e-012
Methane	6.58e-018	2.22e-016
Ethane	1.20e-008	4.04e-007
Propane	1.01e-010	3.40e-009
Isobutane	3.42e-012	1.15e-010
n-Butane	8.24e-012	2.78e-010
Total Components	100.00	3.37e+003

RICH GLYCOL AND PUMP GAS STREAM

 Temperature: 93.50 deg. F
 Pressure: 614.70 psia
 Flow Rate: 6.37e+000 gpm
 NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.34e+001	3.32e+003
Water	4.89e+000	1.74e+002
Carbon Dioxide	4.87e-002	1.73e+000
Nitrogen	9.74e-003	3.46e-001
Methane	1.59e+000	5.64e+001
Ethane	7.57e-002	2.69e+000
Propane	5.05e-003	1.79e-001
Isobutane	1.92e-004	6.81e-003
n-Butane	4.98e-004	1.77e-002
Total Components	100.00	3.56e+003

REGENERATOR OVERHEADS STREAM

 Temperature: 212.00 deg. F
 Pressure: 14.70 psia
 Flow Rate: 3.99e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.52e+001	1.23e+002
Carbon Dioxide	3.74e-001	1.73e+000
Nitrogen	1.18e-001	3.46e-001
Methane	3.35e+001	5.64e+001
Ethane	8.51e-001	2.69e+000
Propane	3.87e-002	1.79e-001
Isobutane	1.11e-003	6.81e-003
n-Butane	2.90e-003	1.77e-002

MK Midstream Goff West Aggregate RSVRBV-2

Total Components	100.00	1.85e+002
------------------	--------	-----------

MK Midstream Goff West RSVRBV-2

GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: MK Midstream Goff West RSV-2 & RBV -2

File Name:

Date: February 20, 2015

DESCRIPTION:

Description: Two (2) 1.0 MMBTU/hr reboilers, each
possible of 45 MMCFD

Annual Hours of Operation: 8760.0 hours/yr

WET GAS:

Temperature: 93.50 deg. F
Pressure: 600.00 psig
Wet Gas Water Content: Saturated

Component	Conc. (vol %)
Carbon Dioxide	0.4113
Nitrogen	0.3397
Methane	97.2515
Ethane	1.9121
Propane	0.0680
Isobutane	0.0016
n-Butane	0.0035

DRY GAS:

Flow Rate: 45.0 MMSCF/day
Water Content: 7.0 lbs. H2O/MMSCF

LEAN GLYCOL:

Glycol Type: TEG
Water Content: 1.5 wt% H2O
Recirculation Ratio: 3.0 gal/lb H2O

PUMP:

Glycol Pump Type: Gas Injection
Gas Injection Pump Volume Ratio: 0.080 acfm gas/gpm glycol

 * Project Setup Information

Project File : Untitled.Ept
 Model : Stable Oil Tank
 Calculation Method : AP42
 Control Efficiency : 0.0%

Filed Name : MK Midstream Holdings, LLC
 Well Name : Goff West
 Well ID : Tank 1 → TANK (TK-1)
 Permit Number : G35-A107
 Date : 2/20/2015

 * Data Input

Separator Pressure : 23.00[psig]
 Separator Temperature : 85.00[F]
 Ambient Pressure : 14.70[psia]
 Ambient Temperature : 70.00[F]
 C10+ SG : 0.8990
 C10+ MW : 166.00

 -- Stable Oil -----

No.	Component	mol %
1	H2S	0.0298
2	O2	0.0000
3	CO2	0.0813
4	N2	0.0006
5	C1	0.1429
6	C2	0.3200
7	C3	1.6601
8	i-C4	1.0163
9	n-C4	4.3102
10	i-C5	3.0783
11	n-C5	5.0568
12	C6	4.2584
13	C7	10.6399
14	C8	11.1525
15	C9	5.6739
16	C10+	47.3307
17	Benzene	0.5815
18	Toluene	0.2191
19	E-Benzene	0.0732
20	Xylenes	0.6999
21	n-C6	3.6746
22	224Trimethylp	0.0000

 -- Sales Oil -----

Production Rate : 0.4[hbl/day]
 Days of Annual Operation : 365 [days/year]
 API Gravity : 46.0
 Reid Vapor Pressure : 7.70[psia]
 Bulk Temperature : 80.00[F]

 -- Tank and Shell Data -----

Diameter : 10.00[ft]
 Shell Height : 7.60[ft]
 Cone Roof Slope : 0.06
 Average Liquid Height : 4.00[ft]
 Vent Pressure Range : 0.02[psi]
 Solar Absorbance : 0.54

```

-----
-- Meteorological Data
City                : Charleston, WV
Ambient Pressure    : 14.70[psia]
Ambient Temperature : 70.00[F]
Min Ambient Temperature : 44.00[F]
Max Ambient Temperature : 65.50[F]
Total Solar Insolation : 1123.00[Btu/ft^2*day]
    
```

```

*****
* Calculation Results
*****
    
```

```

-----
-- Emission Summary
Item                Uncontrolled      Uncontrolled      Controlled        Controlled
                   [ton/yr]          [lb/hr]          [ton/yr]         [lb/hr]
Total HAPs          0.010             0.002            0.010 ←         0.002
Total HC            0.105            0.024            0.105           0.024
VOCs, C2+          0.105            0.024            0.105           0.024
VOCs, C3+          0.105            0.024            0.105 ←         0.024
    
```

```

Uncontrolled Recovery Info.
Vapor              2.9200 x1E-3    [MSCFD]
HC Vapor           2.9200 x1E-3    [MSCFD]
GOR                6.64            [SCF/bbl]
    
```

```

-----
-- Emission Composition
No Component        Uncontrolled      Uncontrolled      Controlled        Controlled
                   [ton/yr]          [lb/hr]          [ton/yr]         [lb/hr]
1  H2S              0.000             0.000            0.000            0.000
2  O2               0.000             0.000            0.000            0.000
3  CO2              0.000             0.000            0.000            0.000
4  N2               0.000             0.000            0.000            0.000
5  C1               0.000             0.000            0.000            0.000
6  C2               0.000             0.000            0.000            0.000
7  C3               0.000             0.000            0.000            0.000
8  i-C4             0.002             0.000            0.002            0.000
9  n-C4             0.017             0.004            0.017            0.004
10 i-C5             0.018             0.004            0.018            0.004
11 n-C5             0.027             0.006            0.027            0.006
12 C6               0.012             0.003            0.012            0.003
13 C7               0.013             0.003            0.013            0.003
14 C8               0.005             0.001            0.005            0.001
15 C9               0.001             0.000            0.001            0.000
16 C10+            0.000             0.000            0.000            0.000
17 Benzene         0.001             0.000            0.001            0.000
18 Toluene         0.000             0.000            0.000            0.000
19 E-Benzene       0.000             0.000            0.000            0.000
20 Xylenes         0.000             0.000            0.000            0.000
21 n-C6            0.008             0.002            0.008            0.002
22 224Trimethylp  0.000             0.000            0.000            0.000
Total              0.104            0.024            0.104            0.024
    
```

```

-----
-- Stream Data
No. Component      MW          Stable Oil      Sales Oil      Total Emissions
                   mol %         mol %          mol %         mol %
1  H2S              34.80       0.0508         0.0000        0.0001
2  O2               32.00       0.0000         0.0000        0.0000
3  CO2              44.01       0.2437         0.0000        0.0001
4  N2               28.01       0.0102         0.0000        0.0001
5  C1               16.04       0.9543         0.0000        0.0001
6  C2               30.07       0.6701         0.0000        0.0001
7  C3               44.10       2.1827         0.0000        0.0000
8  i-C4             58.12       1.1269         0.0874        2.9902
9  n-C4             58.12       4.6091         0.8786        21.1938
10 i-C5             72.15       3.1066         1.8448        18.2096
11 n-C5             72.15       5.0558         3.6624        26.5224
12 C6              86.16       4.1726         4.4094        9.7878
    
```

13	C7	100.20	10.3655	12.2236	9.3787
14	C8	114.23	10.8426	13.2922	3.3574
15	C9	128.28	5.5127	6.8412	0.6188
16	C10+	166.00	45.9695	57.4281	0.1232
17	Benzene	78.11	0.5685	0.6451	0.8016
18	Toluene	92.13	0.2132	0.2591	0.0928
19	E-Benzene	106.17	0.0711	0.0881	0.0107
20	Xylenes	106.17	0.6802	0.8429	0.0895
21	n-C6	86.18	3.5939	3.9401	6.8229
22	224Trimethylp	114.24	0.0000	0.0000	0.0000
	MW		126.33	134.55	75.04
	Stream Mole Ratio		1.0000	0.9916	0.0084
	Heating Value [BTU/SCF]				4133.98
	Gas Gravity [Gas/Air]				2.59
	Bubble Pt. @ 100F[psia]		18.82	2.69	
	RVP @ 100F [psia]		75.59	17.80	
	SG @ 100F		0.804	0.819	

```

*****
*   Project Setup Information   *
*****
Project File       : C:\Documents and Settings\Bill Monroe\My Documents\MK Midstream Tank 1.ept
Model              : Stable Oil Tank
Calculation Method : AP42
Control Efficiency : 0.0%

Filed Name        : MK Midstream Holdings, LLC
Well Name         : Goff West
Well ID           : Tank 2
Permit Number     : G35-A107
Date              : 2/20/2015
    
```

TANK 2 (TK-2)

```

*****
*   Data Input                 *
*****
Separator Pressure : 23.00[psig]
Separator Temperature : 85.00[F]
Ambient Pressure   : 14.70[psia]
Ambient Temperature : 70.00[F]
C10+ SG            : 0.8990
C10+ MW            : 166.00
    
```

--- Stable Oil ---

No.	Component	mol %
1	H2S	0.0298
2	O2	0.0000
3	CO2	0.0813
4	N2	0.0006
5	C1	0.1429
6	C2	0.3200
7	C3	1.6601
8	i-C4	1.0163
9	n-C4	4.3102
10	i-C5	3.0783
11	n-C5	5.0568
12	C6	4.2584
13	C7	10.6399
14	C8	11.1525
15	C9	5.6739
16	C10+	47.3307
17	Benzene	0.5815
18	Toluene	0.2191
19	E-Benzene	0.0732
20	Xylenes	0.6999
21	n-C6	3.6746
22	2,2,4-Trimethylp	0.0000

--- Sales Oil ---

```

Production Rate       : 0 [bbl/day]
Days of Annual Operation : 365 [days/year]
API Gravity           : 46.0
Reid Vapor Pressure  : 7.70[psia]
Bulk Temperature     : 80.00[F]
    
```

--- Tank and Shell Data ---

```

Diameter              : 6.00[ft]
Shell Height          : 3.50[ft]
Cone Roof Slope       : 0.06
Average Liquid Height : 1.00[ft]
Vent Pressure Range   : 0.02[psi]
Solar Absorbance      : 0.17
    
```

```

-- Meteorological Data -----
City                : Charleston, WV
Ambient Pressure    : 14.70[psia]
Ambient Temperature : 70.00[F]
Min Ambient Temperature : 44.00[F]
Max Ambient Temperature : 65.50[F]
Total Solar Insolation : 1123.00[Btu/ft^2*day]
    
```

 * Calculation Results

```

-- Emission Summary -----
Item                Uncontrolled      Uncontrolled      Controlled      Controlled
                   [ton/yr]          [lb/hr]          [ton/yr]       [lb/hr]
Total HAPs          0.000             0.000            0.000 ←        0.000
Total HC            0.010             0.002            0.010          0.002
VOCs, C2+          0.010             0.002            0.010          0.002
VOCs, C3+          0.010             0.002            0.010 ←        0.002
    
```

```

Uncontrolled Recovery Info.
Vapor                0.2600 x1E-3      [MSCFD]
HC Vapor             0.2600 x1E-3      [MSCFD]
GOR                  6.50              [SCF/bbl]
    
```

```

-- Emission Composition -----
No Component        Uncontrolled      Uncontrolled      Controlled      Controlled
                   [ton/yr]          [lb/hr]          [ton/yr]       [lb/hr]
1  H2S              0.000             0.000            0.000          0.000
2  O2               0.000             0.000            0.000          0.000
3  CO2              0.000             0.000            0.000          0.000
4  N2               0.000             0.000            0.000          0.000
5  C1               0.000             0.000            0.000          0.000
6  C2               0.000             0.000            0.000          0.000
7  C3               0.000             0.000            0.000          0.000
8  i-C4             0.000             0.000            0.000          0.000
9  n-C4             0.001             0.000            0.001          0.000
10 i-C5             0.002             0.000            0.002          0.000
11 n-C5             0.003             0.001            0.003          0.001
12 C6               0.001             0.000            0.001          0.000
13 C7               0.002             0.000            0.002          0.000
14 C8               0.001             0.000            0.001          0.000
15 C9               0.000             0.000            0.000          0.000
16 C10+            0.000             0.000            0.000          0.000
17 Benzene          0.000             0.000            0.000          0.000
18 Toluene          0.000             0.000            0.000          0.000
19 E-Benzene        0.000             0.000            0.000          0.000
20 Xylenes          0.000             0.000            0.000          0.000
21 n-C6             0.001             0.000            0.001          0.000
22 224Trimethylp   0.000             0.000            0.000          0.000
Total               0.011             0.003            0.011          0.003
    
```

```

-- Stream Data -----
No. Component      MW          Stable Oil      Sales Oil      Total Emissions
                   mol %        mol %          mol %          mol %
1  H2S              34.80       0.0508         0.0000         0.0001
2  O2               32.00       0.0000         0.0000         0.0000
3  CO2              44.01       0.2437         0.0000         0.0001
4  N2               28.01       0.0102         0.0000         0.0001
5  C1               16.04       0.9543         0.0000         0.0001
6  C2               30.07       0.6701         0.0000         0.0001
7  C3               44.10       2.1827         0.0000         0.0000
8  i-C4             58.12       1.1269         0.0024         0.1021
9  n-C4             58.12       4.6091         0.2720         8.3760
10 i-C5             72.15       3.1066         1.3102         17.4394
11 n-C5             72.15       5.0558         2.9372         28.9692
12 C6               86.16       4.1726         4.4414         13.6143
    
```

13	C7	100.20	10.3655	13.1489	14.0239
14	C8	114.23	10.8426	14.6366	5.1545
15	C9	128.28	5.5127	7.5889	0.9585
16	C10+	166.00	45.9695	63.9628	0.1876
17	Benzene	78.11	0.5685	0.6793	1.1607
18	Toluene	92.13	0.2132	0.2840	0.1404
19	E-Benzene	106.17	0.0711	0.0975	0.0164
20	Xylenes	106.17	0.6802	0.9343	0.1373
21	n-C6	86.18	3.5939	4.0572	9.7194
22	224Trimethylp	114.24	0.0000	0.0000	0.0000
	MW		126.33	136.75	80.24
	Stream Mole Ratio		1.0000	0.9917	0.0083
	Heating Value [BTU/SCF]				4402.44
	Gas Gravity [Gas/Air]				2.77
	Bubble Pt. @ 100F[psia]		18.82	1.88	
	RVP @ 100F [psia]		75.59	12.62	
	SG @ 100F		0.804	0.824	

ATTACHMENT J

**AIR QUALITY PERMIT NOTICE
Notice of Application**

Notice is given that MK Midstream Holdings, LLC. has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for General Registration Modification Update G35-A107A Plant ID# 033-00187 for Goff West, a Natural Gas Compressor Station located near Davisson Run Road, Route 50E, near the town of Clarksburg, in Harrison County, West Virginia.

The applicant estimates the increased potential to discharge the following Regulated Air Pollutants will be: NO_x = 47.51 TPY, CO = 17.48 TPY, VOC's = 27.34 TPY, HCHO = 10.86 TPY, SOX = 0.205 TPY & PM₁₀ = 3.18 TPY GHG(CO₂(e)) = 44085 TPY, GHG(CH₄) = 1274 TPY

Latitude 39.2766N
Longitude 80.4038W

Startup of and operation to begin on or about the 1st day of December, 2015. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1227, during normal business hours.

Dated this the 15th day of September, 2015.

By: MK Midstream Holdings, LLC
Len Paugh
COO & SVP
65 Professional Place, Suite 200
Bridgeport, WV 26330

The Exponent Telegram

P.O. Box 2000
Clarksburg, WV 26302
Phone: 304-626-1420
Fax: 304-622-3629
Classified@theet.com

Advertising Invoice

Advertising Invoice

MK MIDSTREAM
65 PROFESSIONAL PL
SUITE 200
BRIDGEPORT, WV 26330

Acct#:28715
Ad#:54394
Phone#:304-848-9130
Date:09/28/2015

Salesperson: Loretta Greathouse

Classification: 999 Legal Ads

Ad Size: 1.0 x 5.90

Advertisement Information:

Description	Start	Stop	Ins.	Cost/Day	Total
Classified Exponent	09/26/2015	09/28/2015	2	36.91	73.81
Affidavit Fee	-	-	-	-	3.00

Payment Information:

Date:	Order#	Type
09/24/2015	54394	BILLED ACCOUNT

Total Amount: 76.81

Amount Due: 76.81

Attention: Please return the top portion of this invoice with your payment including account and ad number.

Ad Copy

PUBLISHER'S CERTIFICATE

I, Loretta Greathouse
Advertising Manager of THE EXPONENT
TELEGRAM, a newspaper of general circulation
published in the city of Clarksburg, County and state
aforesaid, do hereby certify that the annexed:

AIR QUALITY PERMIT NOTICE

was published in THE EXPONENT-TELEGRAM 2
time(s) commencing on 09/26/2015 and ending on
09/28/2015 at the request of

MK MIDSTREAM.

Given under my hand this 09/28/15.

The publisher's fee for said publication is: \$76.81.

Loretta Greathouse
Advertising Manager of The Exponent-Telegram

Subscribed to and sworn to before me this 09/28/15

Sarah E. Hurst
Notary Public in and for Harrison County, WV

My commission expires on

The 29th day of August 2017

**ATTACHMENT J
AIR QUALITY
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Latitude 39.2766N
Longitude 80.4038W
Startup of and operation to begin on or about the 1st day of December, 2015. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.
Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1227, during normal business hours.
Dated this the 15th day of September, 2015.
By: MK Midstream Holdings, LLC
Len Paugh
CCO & SVP
65 Professional Place,
Suite 200
Bridgeport, WV 26330



ATTACHMENT L

PLEASE ATTACH A CHECK PAYABLE TO:

“WVDEP – DIVISION OF AIR QUALITY”

AMOUNT: \$500 APPLICATION + \$1,000 NSPS = \$1,500

G3516B

GAS ENGINE TECHNICAL DATA



ENGINE SPEED (rpm):	1400	FUEL:	Nat Gas
COMPRESSION RATIO:	8:1	FUEL SYSTEM:	CAT WIDE RANGE
AFTERCOOLER - STAGE 2 INLET (°F):	130		WITH AIR FUEL RATIO CONTROL
AFTERCOOLER - STAGE 1 INLET (°F):	201	FUEL PRESSURE RANGE(psig):	5.0-50.0
JACKET WATER OUTLET (°F):	210	FUEL METHANE NUMBER:	80
COOLING SYSTEM:	JW+OC+1AC, 2AC	FUEL LHV (Btu/scf):	905
IGNITION SYSTEM:	ADEM3	ALTITUDE CAPABILITY AT 100°F INLET AIR TEMP. (ft):	4000
EXHAUST MANIFOLD:	DRY	APPLICATION:	Gas Compression
COMBUSTION:	Ultra Lean Burn		
NOx EMISSION LEVEL (g/bhp-hr NOx):	0.5		

RATING	NOTES	LOAD	100%	75%	50%
ENGINE POWER (WITHOUT FAN)	(1)	bhp	1380	1035	691
ENGINE EFFICIENCY (ISO 3046/1)	(2)	%	34.9	32.5	30.3
ENGINE EFFICIENCY (NOMINAL)	(2)	%	34.2	31.9	29.7

ENGINE DATA					
FUEL CONSUMPTION (ISO 3046/1)	(3)	Btu/bhp-hr	7300	7819	8399
FUEL CONSUMPTION (NOMINAL)	(3)	Btu/bhp-hr	7442	7971	8562
AIR FLOW (77°F, 14.7 psia) (WET)	(4) (5)	scfm	3126	2452	1714
AIR FLOW (WET)	(4) (5)	lb/hr	13859	10872	7602
COMPRESSOR OUT PRESSURE		in Hg(abs)	103.7	91.7	69.4
COMPRESSOR OUT TEMPERATURE		°F	381	354	274
AFTERCOOLER AIR OUT TEMPERATURE		°F	133	133	131
INLET MAN. PRESSURE	(6)	in Hg(abs)	94.6	76.8	54.0
INLET MAN. TEMPERATURE (MEASURED IN PLENUM)	(7)	°F	146	146	143
TIMING	(8)	°BTDC	30.0	28.7	24.1
EXHAUST STACK TEMPERATURE	(9)	°F	992	938	1006
EXHAUST GAS FLOW (@stack temp, 14.5 psia) (WET)	(10) (5)	ft ³ /min	9124	6900	5065
EXHAUST GAS MASS FLOW (WET)	(10) (5)	lb/hr	14377	11288	7899

EMISSIONS DATA					
NOx (as NO2)	(11)	g/bhp-hr	0.50	0.50	0.50
CO	(12)	g/bhp-hr	2.43	2.61	2.58
THC (mol. wt. of 15.84)	(12)	g/bhp-hr	4.77	5.11	5.18
NMHC (mol. wt. of 15.84)	(12)	g/bhp-hr	0.71	0.77	0.78
NMNEHC (VOCs) (mol. wt. of 15.84)	(12)(13)	g/bhp-hr	0.48	0.51	0.52
HCHO (Formaldehyde)	(12)	g/bhp-hr	0.43	0.43	0.42
CO2	(12)	g/bhp-hr	474	505	549
EXHAUST OXYGEN	(14)	% DRY	9.0	8.7	8.3
LAMBDA	(14)		1.68	1.64	1.60

ENERGY BALANCE DATA					
LHV INPUT	(15)	Btu/min	171162	137537	98551
HEAT REJECTION TO JACKET WATER (JW)	(16)(23)	Btu/min	23454	24132	20035
HEAT REJECTION TO ATMOSPHERE	(17)	Btu/min	6110	5093	4076
HEAT REJECTION TO LUBE OIL (OC)	(18)(23)	Btu/min	4449	3947	3324
HEAT REJECTION TO EXHAUST (LHV TO 77°F)	(19)	Btu/min	62411	46273	34853
HEAT REJECTION TO EXHAUST (LHV TO 350°F)	(19)	Btu/min	41610	29857	23415
HEAT REJECTION TO A/C - STAGE 1	(20)(23)	Btu/min	10041	8304	2813
HEAT REJECTION TO A/C - STAGE 2	(21)(24)	Btu/min	5357	5061	3334
PUMP POWER	(22)	Btu/min	833	833	833

CONDITIONS AND DEFINITIONS

Engine rating obtained and presented in accordance with ISO 3046/1. (Standard reference conditions of 77°F, 29.80 in Hg barometric pressure, 500 ft. altitude.) No overload permitted at rating shown. Consult altitude curves for applications above maximum rated altitude and/or temperature.

Emission levels are at engine exhaust flange prior to any after treatment. Values are based on engine operating at steady state conditions. Tolerances specified are dependent upon fuel quality. Fuel methane number cannot vary more than ± 3.

For notes information consult page three.

CE IR - 4R



DCL International Inc.

Mailing address: P.O. Box 90, Concord, Ontario, Canada, L4K 1B2
Toll free: 1-800-872-1968 Phone: 905-660-6450 Fax: 905-660-6435 E-mail: info@dcl-inc.com

To	Mark Davis	Phone	
	J-W Power	Fax	
Date	January 4, 2010	Email	mdavis@jwenergy.com

RE: EMISSIONS GUARANTEE

Mark,

We hereby guarantee that our QUICK-LID™ Model DC65A-12 catalytic converter described below:

Catalyst model	DC65
Catalyst coating	Oxidation (A coating)
Outside Diameter of catalyst substrate	30.75"
No. of catalyst substrates	1
Cell Density	300 cps

and sized for the following engine:

Engine model	CAT G3516 ULB
Power	1380 hp @ 1400 rpm
Fuel	Pipeline Quality Natural Gas

will perform as follows:

Emissions	After Catalyst (% destruction)
Carbon Monoxide (CO)	93%
Formaldehyde (CH ₂ O)	90%
Volatile Organic Compounds	80%

for a period of 1 year or 8000 hours, whichever comes first, subject to all terms and conditions contained in the attached warranty document being respected and met.

Best regards,
DCL International, Inc.

Tawnya Van Groningen
Account Manager
North American Industrial Catalyst Division

Quote#16-1558



CE-SR

Mk Cathers #2 Quote USA Unit 2368 Caterpillar G3608TALE Engine Emissions

Date of Manufacture	<u>April 11, 2011</u>	Engine Serial Number	<u>BEN00694</u>	Date Modified/Reconstructed	<u>Not Any</u>
Driver Rated HP	<u>2370</u>	Rated Speed in RPM	<u>1000</u>	Combustion Type	<u>Spark Ignited 4 Stroke</u>
Number of Cylinders	<u>8</u>	Compression Ratio	<u>9:1</u>	Combustion Setting	<u>Ultra Lean Burn</u>
Total Displacement, in ³	<u>10350</u>	Fuel Delivery Method	<u>Fuel Injection</u>	Combustion Air Treatment	<u>T.C./Aftercooled</u>

Raw Engine Emissions (customer supplied fuel gas with little to no H2S)

Fuel Consumption	6840 LHV BTU/bhp-hr	or	7589 HHV BTU/bhp-hr
Altitude	1200 ft		
Maximum Air Inlet Temp	90 F		

	<u>g/bhp-hr¹</u>	<u>lb/MMBTU²</u>	<u>lb/hr</u>	<u>TPY</u>
Nitrogen Oxides (NOx)	0.5		2.61	11.44
Carbon Monoxide (CO)	2.74		14.32	62.70
Volatile Organic Compounds (VOC or NMNEHC excluding CH2O)	0.63		3.29	14.42
Formaldehyde (CH2O)	0.26		1.36	5.95
Particulate Matter (PM) <small>Filterable+Condensable</small>		9.99E-03	1.80E-01	7.87E-01
Sulfur Dioxide (SO2)		5.88E-04	1.06E-02	4.63E-02
	<u>g/bhp-hr¹</u>		<u>lb/hr</u>	<u>Metric Tonne/yr</u>
Carbon Dioxide (CO2)	440		2299	9133
Methane (CH4)	5.36		28.01	111.26

¹ g/bhp-hr are based on Caterpillar Specifications (GERP) with customer supplied fuel gas, 1200 ft elevation, and 90 F Max Air Inlet Temperature. Note that g/bhp-hr values are based on 100% Load Operation. For air permitting, it is recommended to use a 20% safety margin for CO, VOC and other organic compounds to allow for variation in operating parameters and fuel gas quality.

² Emission Factor obtained from EPA's AP-42, Fifth Edition, Volume I, Chapter 3: Stationary Internal Combustion Sources (Section 3.2 Natural Gas-Fired Reciprocating Engines, Table 3.2-2).

Catalytic Converter Emissions

Catalytic Converter Make and Model:	EmIt, ELX6200Z-2022F
Element Type:	Oxidation
Number of Elements in Housing:	3
Air/Fuel Ratio Control	Caterpillar ADEM3

	<u>% Reduction</u>	<u>lb/hr</u>	<u>TPY</u>
Nitrogen Oxides (NOx)	0	2.61	11.44
Carbon Monoxide (CO)	93	1.00	4.39
Volatile Organic Compounds (VOC or NMNEHC excluding CH2O)	50	1.65	7.21
Formaldehyde (CH2O)	50	0.68	2.98
Particulate Matter (PM)	0	1.80E-01	7.87E-01
Sulfur Dioxide (SO2)	0	1.06E-02	4.63E-02
	<u>% Reduction</u>	<u>lb/hr</u>	<u>Metric Tonne/yr</u>
Carbon Dioxide (CO2)	0	2299	9133
Methane (CH4)	0	28.01	111.26



2585 Heartland Drive
 Sheridan, WY 82801
 Office: | Direct: +1 (307) 675.5310
 kdunham@emittechnologies.com

Prepared For:

Chris Magee
 USA COMPRESSION

QUOTE: QUO-16705-Z2F9

INFORMATION PROVIDED BY CATERPILLAR

Engine: G3608
 Horsepower: 2370
 RPM: 1000
 Compression Ratio: 9.2
 Exhaust Flow Rate: 16228 CFM
 Exhaust Temperature: 858 °F
 Reference: DM8606-06-001
 Fuel: Natural Gas
 Annual Operating Hours: 8760

Uncontrolled Emissions

	<u>g/bhp-hr</u>	<u>Lb/Hr</u>	<u>Tons/Year</u>
NOx:	0.50	2.61	11.44
CO:	2.74	14.32	62.71
THC:	6.30	32.92	144.18
NMHC	0.94	4.91	21.51
NMNEHC:	0.63	3.29	14.42
HCHO:	0.26	1.36	5.95
O2:	12.00 %		

POST CATALYST EMISSIONS

	<u>% Reduction</u>	<u>g/bhp-hr</u>	<u>Lb/Hr</u>	<u>Tons/Year</u>
NOx:	Unaffected by Oxidation Catalyst			
CO:	>93 %	<0.19	<1.00	<4.39
VOC:	>50 %	<0.32	<1.65	<7.21
HCHO:	>50 %	<0.13	<0.68	<2.98

CONTROL EQUIPMENT

Catalyst Housing

Model: ELX-6200-2022F-6CE0-362
 Manufacturer: EMIT Technologies, Inc
 Element Size: Rectangle 36" x 15" x 3.5"
 Housing Type: 6 Element Capacity
 Catalyst Installation: Accessible Housing
 Construction: 3/16" Carbon Steel
 Sample Ports: 9 (0.5" NPT)
 Inlet Connections: 20" Flat Face Flange
 Outlet Connections: 22" Flat Face Flange
 Configuration: End In / Side Out
 Silencer: Integrated
 Silencer Grade: Hospital Enhanced
 Insertion Loss: 35-50 dBA

Catalyst Element

Model: RT-3615-Z
 Catalyst Type: Oxidation, Standard Precious Group Metals
 Substrate Type: BRAZED
 Manufacturer: EMIT Technologies, Inc
 Element Quantity: 3
 Element Size: Rectangle 36" x 15" x 3.5"

CE-5R

The information in this quotation, and any files transmitted with it, is confidential and may be legally privileged. It is intended only for the use of individual(s) within the company named above. If you are the intended recipient, be aware that your use of any confidential or personal information may be restricted by state and federal privacy laws.

G3608

GAS COMPRESSION APPLICATION

GAS ENGINE SITE SPECIFIC TECHNICAL DATA MK GoffWest 9-21-15 Cathers #2 G3608

CE-5R

CATERPILLAR®

ENGINE SPEED (rpm): 1000
 COMPRESSION RATIO: 9.2:1
 AFTERCOOLER TYPE: SCAC
 JACKET WATER OUTLET (°F): 180
 ASPIRATION: TA
 COOLING SYSTEM: JW, OC+AC
 CONTROL SYSTEM: CIS/ADEM3
 EXHAUST MANIFOLD: DRY
 COMBUSTION: LOW EMISSION
 NOx EMISSION LEVEL (g/bhp-hr NOx): 0.5

RATING STRATEGY:
 RATING LEVEL:
 FUEL SYSTEM:

STANDARD CONTINUOUS GAV
 WITH AIR FUEL RATIO CONTROL

SITE CONDITIONS:

FUEL:
 FUEL PRESSURE RANGE (psig):
 FUEL METHANE NUMBER:
 FUEL LHV (Btu/scf):
 ALTITUDE (ft):
 MAXIMUM INLET AIR TEMPERATURE (°F):
 STANDARD RATED POWER:

MK Goffwest 9-21-15
 42.8-47.0
 89.2
 936
 1200
 90
 2370 bhp@1000rpm

RATING	NOTES	LOAD	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE			
			100%	100%	75%	50%
ENGINE POWER (WITHOUT FAN)	(1)	bhp	2370	2370	1777	1185
INLET AIR TEMPERATURE		°F	90	90	90	90

ENGINE DATA							
FUEL CONSUMPTION (LHV)		Btu/bhp-hr	6840	6840	7082	7785	
FUEL CONSUMPTION (HHV)	(2)	Btu/bhp-hr	7589	7589	7858	8638	
AIR FLOW (@inlet air temp, 14.7 psia)	(3)(4)	ft ³ /min	6370	6370	4886	3371	(WET)
AIR FLOW	(3)(4)	lb/hr	27579	27579	21152	14583	(WET)
FUEL FLOW (60°F, 14.7 psia)		scfm	289	289	224	164	
INLET MANIFOLD PRESSURE	(5)	in Hg(abs)	75.2	75.2	57.6	40.9	
EXHAUST TEMPERATURE - ENGINE OUTLET	(6)	°F	858	858	897	978	
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(7)(4)	ft ³ /min	16228	16228	12826	9408	(WET)
EXHAUST GAS MASS FLOW	(7)(4)	lb/hr	28339	28339	21742	15025	(WET)

EMISSIONS DATA - ENGINE OUT							
NOx (as NO2)	(8)(9)	g/bhp-hr	0.50	0.50	0.50	0.50	
CO	(8)(9)	g/bhp-hr	2.74	2.74	2.74	2.74	
THC (mol. wt. of 15.84)	(8)(9)	g/bhp-hr	6.30	6.30	6.56	6.80	
NMHC (mol. wt. of 15.84)	(8)(9)	g/bhp-hr	0.94	0.94	0.98	1.02	
NMNEHC (VOCs) (mol. wt. of 15.84)	(8)(9)(10)	g/bhp-hr	0.63	0.63	0.66	0.68	
HCHO (Formaldehyde)	(8)(9)	g/bhp-hr	0.26	0.26	0.28	0.31	
CO2	(8)(9)	g/bhp-hr	440	440	459	504	
EXHAUST OXYGEN	(8)(11)	% DRY	12.0	12.0	11.8	11.4	

HEAT REJECTION							
HEAT REJ. TO JACKET WATER (JW)	(12)	Btu/min	25087	25087	21001	17432	
HEAT REJ. TO ATMOSPHERE	(12)	Btu/min	9456	9456	8812	8457	
HEAT REJ. TO LUBE OIL (OC)	(12)	Btu/min	12158	12158	11540	11532	
HEAT REJ. TO AFTERCOOLER (AC)	(12)(13)	Btu/min	20561	20561	9579	1933	

COOLING SYSTEM SIZING CRITERIA			
TOTAL JACKET WATER CIRCUIT (JW)	(13)	Btu/min	27595
TOTAL AFTERCOOLER CIRCUIT (OC+AC)	(13)(14)	Btu/min	36179

A cooling system safety factor of 0% has been added to the cooling system sizing criteria.

CONDITIONS AND DEFINITIONS

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

For notes information consult page three.

CE-6R



USA Compression Units 2669 Caterpillar G3606TALE Engine Emissions

Date of Manufacture	<u>December 12, 2014</u>	Engine Serial Number	<u>42502061</u>	Date Modified/Reconstructed	<u>Not Any</u>
Driver Rated HP	<u>1775</u>	Rated Speed in RPM	<u>1000</u>	Combustion Type	<u>Spark Ignited 4 Stroke</u>
Number of Cylinders	<u>6</u>	Compression Ratio	<u>9:1</u>	Combustion Setting	<u>Ultra Lean Burn</u>
Total Displacement, in ³	<u>7762</u>	Fuel Delivery Method	<u>Fuel Injection</u>	Combustion Air Treatment	<u>T.C./Aftercooled</u>

Raw Engine Emissions (Customer Supplied Fuel Gas with little to no H2S)

Fuel Consumption 6860 LHV BTU/bhp-hr or 7611 HHV BTU/bhp-hr
 Altitude 1200 ft
 Maximum Air Inlet Temp 90 F

	<u>g/bhp-hr¹</u>	<u>lb/MMBTU²</u>	<u>lb/hr</u>	<u>TPY</u>
Nitrogen Oxides (NOx)	0.5		1.96	8.57
Carbon Monoxide (CO)	2.74		10.72	46.96
Volatile Organic Compounds (VOC or NMNEHC excluding CH2O)	0.63		2.47	10.80
Formaldehyde (CH2O)	0.26		1.02	4.46
Particulate Matter (PM) <small>Filterable/Condensable</small>		9.99E-03	1.35E-01	5.91E-01
Sulfur Dioxide (SO2)		5.88E-04	7.94E-03	3.48E-02
	<u>g/bhp-hr¹</u>		<u>lb/hr</u>	<u>Metric Tonne/yr</u>
Carbon Dioxide (CO2)	441		1726	6856
Methane (CH4)	2.66		10.41	41.35

¹ g/bhp-hr are based on Caterpillar Specifications (GERP) Customer supplied fuel gas, 1200 ft elevation, and 90 F Max Air Inlet Temperature. Note that g/bhp-hr values are based on 100% Load Operation. For air permitting, it is recommended to use a 20% safety margin for CO, VOC and other organic compounds to allow for variation in operating parameters and fuel gas quality.

² Emission Factor obtained from EPA's AP-42, Fifth Edition, Volume I, Chapter 3: Stationary Internal Combustion Sources (Section 3.2 Natural Gas-Fired Reciprocating Engines, Table 3.2-2).

Catalytic Converter Emissions

Catalytic Converter Make and Model: DCL DC64-L2
 Element Type: DC-24.23" Round
 Number of Elements in Housing: 2
 Air/Fuel Ratio Control: Caterpillar ADEM A3, Burn Time

	<u>% Reduction</u>	<u>lb/hr</u>	<u>TPY</u>
Nitrogen Oxides (NOx)	0	1.96	8.57
Carbon Monoxide (CO)	93	0.75	3.29
Volatile Organic Compounds (VOC or NMNEHC excluding CH2O)	50	1.23	5.40
Formaldehyde (CH2O)	50	0.51	2.23
Particulate Matter (PM)	0	1.35E-01	5.91E-01
Sulfur Dioxide (SO2)	0	7.94E-03	3.48E-02
	<u>% Reduction</u>	<u>lb/hr</u>	<u>Metric Tonne/yr</u>
Carbon Dioxide (CO2)	0	1726	6856
Methane (CH4)	0	10.41	41.35



CE-GR

1610 Woodstead Ct, Suite 245, The Woodlands, Texas 77380 USA
 Tel: 877-965-8989 Fax: 281-605-5858 info@dcl-inc.com www.dcl-inc.com

GLOBAL LEADER IN EMISSION CONTROL SOLUTIONS

To:	Chris Magee	Phone:	
Company:	USA Compression	Email:	
Date:	September 21, 2015	No. Pages:	1

Dear Chris,

We hereby guarantee that our Model DC64L2 specified below with two (2) elements installed as described below, and sized for the following engine:

Engine Data	
Engine Model	Caterpillar G3606
Power	1775HP
Fuel	High Methane NG
Exhaust Flow Rate	12, 211 acfm
Exhaust Temperature	847°F

Catalyst Data	
Catalyst Model	DC64L2
Type	Oxidation- A
# of Elements	2
Cell Density	300 cpsi
Approx Dimensions	See attached drawing
Approx Pressure Drop	4.1" w.c

will perform as follows:

Exhaust Component	Engine Output (g-bhp/hr)	Converter Output % reduction
CO	2.74	93%
VOC	0.63	50%
CH20	0.26	50%

for a period of 1 year or 8000 hours, whichever comes first, subject to all terms and conditions contained in the attached warranty document being respected and met.

Best Regards,

On behalf of DCL America Inc.

Lisa Barber

416-788-8021

lbarber@dcl-inc.com

G3606

GAS COMPRESSION APPLICATION

GAS ENGINE SITE SPECIFIC TECHNICAL DATA MK GoffWest 9-21-15 Cathers #1 G3606

CB-GR

CATERPILLAR®

ENGINE SPEED (rpm): 1000
 COMPRESSION RATIO: 9.2:1
 AFTERCOOLER TYPE: SCAC
 JACKET WATER OUTLET (°F): 190
 ASPIRATION: TA
 COOLING SYSTEM: JW, OC+AC
 CONTROL SYSTEM: CIS/ADEM3
 EXHAUST MANIFOLD: DRY
 COMBUSTION: LOW EMISSION
 NOx EMISSION LEVEL (g/bhp-hr NOx): 0.5

RATING STRATEGY:
 RATING LEVEL:
 FUEL SYSTEM:

STANDARD
 CONTINUOUS
 GAV
 WITH AIR FUEL RATIO CONTROL

SITE CONDITIONS:

FUEL:
 FUEL PRESSURE RANGE(psig):
 FUEL METHANE NUMBER:
 FUEL LHV (Btu/scf):
 ALTITUDE(ft):
 MAXIMUM INLET AIR TEMPERATURE(°F):
 STANDARD RATED POWER:

MK Goffwest 9-21-15
 42.8-47.0
 89.2
 936
 1200
 90
 1775 bhp@1000rpm

RATING	NOTES	LOAD	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE			
			100%	100%	75%	50%
ENGINE POWER (WITHOUT FAN)	(1)	bhp	1775	1775	1331	888
INLET AIR TEMPERATURE		°F	90	90	90	90

ENGINE DATA							
FUEL CONSUMPTION (LHV)	(2)	Btu/bhp-hr	6860	6860	7102	7619	
FUEL CONSUMPTION (HHV)	(2)	Btu/bhp-hr	7611	7611	7880	8454	
AIR FLOW (@inlet air temp, 14.7 psia)	(3)(4)	ft ³ /min	4833	4833	3738	2518	(WET)
AIR FLOW	(3)(4)	lb/hr	20924	20924	16181	10900	(WET)
FUEL FLOW (60°F, 14.7 psia)		scfm	217	217	168	120	
INLET MANIFOLD PRESSURE	(5)	in Hg(abs)	74.3	74.3	57.9	41.2	
EXHAUST TEMPERATURE - ENGINE OUTLET	(6)	°F	847	847	870	937	
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(7)(4)	ft ³ /min	12211	12211	9611	6820	(WET)
EXHAUST GAS MASS FLOW	(7)(4)	lb/hr	21495	21495	16824	11217	(WET)

EMISSIONS DATA - ENGINE OUT							
NOx (as NO2)	(8)(9)	g/bhp-hr	0.50	0.50	0.50	0.50	
CO	(8)(9)	g/bhp-hr	2.74	2.74	2.74	2.74	
THC (mol. wt. of 15.84)	(8)(9)	g/bhp-hr	6.30	6.30	6.50	6.77	
NMHC (mol. wt. of 15.84)	(8)(9)	g/bhp-hr	0.84	0.84	0.98	1.01	
NMNEHC (VOCs) (mol. wt. of 15.84)	(8)(9)(10)	g/bhp-hr	0.63	0.63	0.65	0.68	
HCHO (Formaldehyde)	(8)(9)	g/bhp-hr	0.26	0.26	0.28	0.31	
CO2	(8)(9)	g/bhp-hr	441	441	460	494	
EXHAUST OXYGEN	(8)(11)	% DRY	12.8	12.8	12.1	11.1	

HEAT REJECTION							
HEAT REJ. TO JACKET WATER (JW)	(12)	Btu/min	18752	18752	15595	13025	
HEAT REJ. TO ATMOSPHERE	(12)	Btu/min	7103	7103	6618	6199	
HEAT REJ. TO LUBE OIL (OC)	(12)	Btu/min	9132	9132	8667	8453	
HEAT REJ. TO AFTERCOOLER (AC)	(12)(13)	Btu/min	16170	16170	8805	1713	

COOLING SYSTEM SIZING CRITERIA			
TOTAL JACKET WATER CIRCUIT (JW)	(13)	Btu/min	20627
TOTAL AFTERCOOLER CIRCUIT (OC+AC)	(13)(14)	Btu/min	27937

A cooling system safety factor of 0% has been added to the cooling system sizing criteria.

CONDITIONS AND DEFINITIONS

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

For notes information consult page three.

Gas Analytical

Report Date: Aug 17, 2015 8:39a

Client:	Mountaineer Keystone	Date Sampled:	Aug 13, 2015
Site:	GOFF WEST	Analysis Date:	Aug 17, 2015 9:04a
Field No:		Collected By:	G. Cutright GAS
Meter:		Date Effective:	Aug 1, 2015 12:00a
Source Laboratory	Clarksburg (Bridgeport), WV	Sample Pressure (PSI):	600.0
Lab File No:	X_CH1-5446x01.CHR	Sample Temp (°F):	
Sample Type:		Field H2O:	No Test
Reviewed By:		Field H2S:	No Test

Component	Mol %	Gal/MSCF
Methane	95.8809	
Ethane	3.4012	0.90
Propane	0.2355	0.06
I-Butane	0.0138	0.00
N-Butane	0.0204	0.01
I-Pentane	0.0042	0.00
N-Pentane	0.0023	0.00
Nitrogen	0.2646	
Oxygen	<MDL	
Carbon Dioxide	0.1686	
Hexanes+	0.0085	0.00
TOTAL	100.0000	0.99

Analytical Results at Base Conditions (Real)	
BTU/SCF (Dry):	1,040.6005 BTU/ft ³
BTU/SCF (Saturated):	1,023.3671 BTU/ft ³
PSIA:	14.730 PSI
Temperature (°F):	60.00 °F
Z Factor (Dry):	0.99786
Z Factor (Saturated):	0.99751

Analytical Results at Contract Conditions (Real)	
BTU/SCF (Dry):	1,040.6005 BTU/ft ³
BTU/SCF (Saturated):	1,023.3671 BTU/ft ³
PSIA:	14.730 PSI
Temperature (°F):	60.00 °F
Z Factor (Dry):	0.99786
Z Factor (Saturated):	0.99751

Calculated Specific Gravities		
Ideal Gravity:	0.5762	Real Gravity: 0.5772
Molecular Wt:	16.6891 lb/lbmol	

Gross Heating Values are Based on:
 GPA 2145-09, 2186
 Compressibility is Calculated using AGA-8.

Source	Date	Notes
Gas Analytical	Aug 17, 2015	RUSH

West Virginia Department of Environmental Protection
Joe Manchin, III
Governor

Division of Air Quality

Randy C. Huffman
Cabinet Secretary

Class II General Permit G35-A Registration to Modify



for the
Prevention and Control of Air Pollution in regard to the
Construction, Modification, Relocation, Administrative Update and
Operation of Natural Gas Compressor Stations
With Glycol Dehydration Units, Flares, or Other Specified Control Devices Herein

*The permittee identified at the facility listed below is authorized to
construct the stationary sources of air pollutants identified herein in accordance
with all terms and conditions of General Permit G35-A.*

G35-A107A

Issued to:

PDC Mountaineer, LLC
PDC West Compressor Station
033-00187

A handwritten signature in blue ink, appearing to read "William F. Durham", written over a horizontal line.

William F. Durham
Director

Issued: April 24, 2015

This Class II General Permit Registration will supercede and replace G35-A107
Facility Location: Clarksburg, Harrison County, West Virginia
Mailing Address: PO Box 26, Bridgeport, WV 26330
Facility Description: Natural Gas Compressor Station
SIC Codes: 1311
UTM Coordinates: 551.408 km Easting • 4,347.731 km Northing • Zone 17
Registration Type: Modification
Description of Change: Addition of four (4) Compressor Engines.

Subject to 40CFR60 Subpart IIII? No
Subject to 40CFR60 Subpart JJJJ? Yes

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

The source is not subject to 45CSR30.

Unless otherwise stated WVDEP DAQ did not determine whether the registrant is subject to an area source air toxics standard requiring Generally Achievable Control Technology (GACT) promulgated after January 1, 2007 pursuant to 40 CFR 63, including the area source air toxics provisions of 40 CFR 63, Subpart HH and 40 CFR 63, Subpart ZZZZ.

All registered facilities under Class II General Permit G35-A are subject to Sections 1.0, 1.1, 2.0, 3.0, and 4.0.

The following sections of Class II General Permit G35-A apply to the registrant:

- | | | |
|------------|---|-------------------------------------|
| Section 5 | Reciprocating Internal Combustion Engines (R.I.C.E.) | <input checked="" type="checkbox"/> |
| Section 6 | Boilers, Reboilers, and Line Heaters | <input checked="" type="checkbox"/> |
| Section 7 | Tanks | <input checked="" type="checkbox"/> |
| Section 8 | Emergency Generators | <input type="checkbox"/> |
| Section 9 | Dehydration Units Not Subject to MACT Standards | <input checked="" type="checkbox"/> |
| Section 10 | Dehydration Units Not Subject to MACT Standards and being controlled by a flare control device | <input type="checkbox"/> |
| Section 11 | Dehydration Units Not Subject to MACT Standards being controlled by recycling the dehydration unit back to the flame zone of the reboiler | <input type="checkbox"/> |
| Section 12 | Dehydration Units Not Subject to MACT Standards and being controlled by a thermal oxidizer | <input type="checkbox"/> |
| Section 13 | Permit Exemption (Less than 1 ton/year of benzene exemption) | <input checked="" type="checkbox"/> |
| Section 14 | Permit Exemption (40CFR63 Subpart HH – Annual average flow of gas exemption (3 mmscf/day)) | <input type="checkbox"/> |
| Section 15 | Permit Exemption (40CFR63 Subpart HHH – Annual average flow of gas exemption (10 mmscf/day)) | <input type="checkbox"/> |
| Section 16 | Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (40CFR60 Subpart JJJ) | <input checked="" type="checkbox"/> |

Emission Units

Emission Unit ID	Emission Unit Description (Make, Model, Serial No.)	Year Installed	Design Capacity (Bhp/rpm)
CE-1R	Caterpillar G3516B LE Compressor Engine	2011	1,380 hp / 1,400 rpm
CE-2R	Caterpillar G3516B LE Compressor Engine	2011	1,380 hp / 1,400 rpm
CE-3R	Caterpillar G3516B LE Compressor Engine	TBD	1,380 hp / 1,400 rpm
CE-4R	Caterpillar G3516B LE Compressor Engine	TBD	1,380 hp / 1,400 rpm
CE-5R	Caterpillar G3516B LE Compressor Engine	TBD	1,380 hp / 1,400 rpm
CE-6R	Caterpillar G3516B LE Compressor Engine	TBD	1,380 hp / 1,400 rpm
RSV-1	Exterran Dehydration Unit	2012	31 mmscf/day
RBV-1	Exterran Reboiler	2012	1.0 mmBtu/hr
RSV-2	Exterran Dehydration Unit	2013	45 mmscf/day
RBV-2	Exterran Reboiler	2013	1.0 mmBtu/hr
TK-1	Used Oil, Water, Condensate Storage Tank	2011	100 bbl
TK-2	TEG & Oil Catch Storage Tank	2011	210 gallons

Emission Limitations

Source ID#	Nitrogen Oxides		Carbon Monoxide		Volatile Organic Compounds		Sulfur Dioxide		Particulate Matter-10		Total HAPs	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
CE-1R	1.52	6.66	0.52	2.27	0.73	3.20	----	0.03	0.10	0.44	0.32	1.41
CE-2R	1.52	6.66	0.52	2.27	0.73	3.20	----	0.03	0.10	0.44	0.32	1.41
CE-3R	1.52	6.66	0.52	2.27	0.73	3.20	----	0.03	0.10	0.44	0.32	1.41
CE-4R	1.52	6.66	0.52	2.27	0.73	3.20	----	0.03	0.10	0.44	0.32	1.41
CE-5R	1.52	6.66	0.52	2.27	0.73	3.20	----	0.03	0.10	0.44	0.32	1.41
CE-6R	1.52	6.66	0.52	2.27	0.73	3.20	----	0.03	0.10	0.44	0.32	1.41
RSV-1	----	----	----	----	0.20	0.88	----	----	----	----	----	----
RBV-1	0.10	0.43	0.08	0.36	----	0.02	----	----	0.01	0.03	----	----
RSV-2	----	----	----	----	0.21	0.89	----	----	----	----	----	----
RBV-2	0.10	0.43	0.08	0.36	----	0.02	----	----	0.01	0.03	----	----
TK-1	----	----	----	----	0.02	0.10	----	----	----	----	----	0.01
TK-2	----	----	----	----	0.01	0.02	----	----	----	----	----	----
TOTAL	9.32	40.82	3.28	14.34	4.82	21.13	0.04	0.18	0.62	2.70	1.92	8.47