BTEC Inc.

NOx and CO Emissions Test Report

Prepared for:

DCP Antrim Gas, LLC

Johannesburg, Michigan

South Chester Antrim CO_2 Removal Facility
6250 Old State Road
Johannesburg, Michigan

Project No. 14-4553.00
July 23, 2014

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EXECUTIVE SUMMARY

BT Environmental Consulting, Inc. (BTEC) was retained by DCP Antrim Gas, LLC (DCP) to evaluate emission rates from twelve emission units located at the South Chester Antrim CO_2 Removal Facility (SCA) at 6250 Old State Road in Johannesburg, Michigan. The emissions test program was conducted during May and June 2014. The results of the emission test program are summarized by Table I.

Table I
Overall Emission Test Results Summary
DCP Antrim Gas, LLC
Johannesburg, Michigan

#	Test Date	Unit	Average NOx Emission Rate (pph)	NOx Emission Limit (pph)	Average CO Emission Rate (pph)	CO Emission Limit (pph)
1	6/25/2014	Plant 1 Heat Media Heater (EUPLANT101)	2.9	5.6	3.8	-
2	6/25/2014	Plant 2 Heat Media Heater (EUPLANT201)	4.8	5.2	0.0	3.0
3	6/24/2014	Plant 3 Heat Media Heater (EUPLANT301)	3.8	5.2	0.0	3.0
4	6/24/2014	Plant 4 Heat Media Heater (EUPLANT401)	3.8	5.2	0.0	3.0
5	6/23/2014	Plant 5 Heat Media Heater (EUPLANT501)	4.7	5.2	0.0	3.0
6	5/28/2014	Plant Generator 6 (EUGEN06)	1.8	5.5	2.7	4.0
7	-	Plant Generator 7 (EUGEN07), will not run until 2015	-	5.5	-	4.0
8	5/29/2014	Plant Generator 8 (EUGEN08)	3.1	5.5	2.4	4.0
9	5/28/2014	Plant Generator 9 (EUGEN09)	1.1	5.5	2.2	4.0
10	6/26/2014	Plant 6 Engine 1 (EUENGINE1)	Results to be submitted in separate test report			
11	6/27/2014	Plant 6 Engine 2 (EUENGINE2)	Results to be submitted in separate test report			
12	6/5/2014	Turbine 1 (EUP5TUR01)	14.5	17.1	2.6	2.3
13	6/5/2014	Turbine 2 (EUP5TUR02)	13.9	17.1	2.2	2.3

*Plant 6 Engines 1 and 2 were tested on June 26 and 27, 2014. Test results will be reported in a separate test report does not include CO emission limitations for the Plant 1 media heater or for Plant 6 Engines 1 and 2.
In addition, the two turbines also have NOx and CO emission limits of 167 ppmvd@15% O_2 and 50 ppmvd@15% O2, respectively. Concentration-based results for the two turbines are as follows:

12	6/5/2014	Turbine 1 (EUP5TUR01)	81	167	24	50
13	6/5/2014	Turbine 2 (EUP5TUR02)	83	167	22	50

1. Introduction

BT Environmental Consulting, Inc. (BTEC) was retained by DCP Antrim Gas, LLC (DCP) to evaluate emission rates from twelve emission units located at the South Chester Antrim CO_2 Removal Facility (SCA) at 6250 Old State Road in Johannesburg, Michigan. The emissions test program was conducted during May and June 2014. The facility operates under Michigan Department of Environmental Quality (MDEQ) Renewable Operating Permit (ROP) No. MIROP-N2940-2009a. The purpose of this report is to document the results of the test program.

AQD has published a guidance document entitled "Format for Submittal of Source Emission Test Plans and Reports" (December 2013, see Appendix A). The following is a summary of the emissions test program and results in the format suggested by the aforementioned document. It should be noted that results from the last two of the emission units tested (Plant 6, Engines 1 and 2) will be reported in a separate emissions test report.

1.a Identification, Location, and Dates of Test

The DCP SCA facility is located at 6250 Old State Road in Johannesburg, Michigan. The emission units tested and the corresponding test dates are summarized by Table 1.

1.b Purpose of Testing

As summarized by Table 1, the ROP for the SCA site required testing of oxides or nitrogen (NOx) and carbon monoxide (CO) emission rates from a total of thirteen emission units[1]. Because Plant Generator 7 (EUGEN7) will not operate again until 2015, the emissions test program did not include EUGEN7. The remainder of the emission units listed in Table 1 were included in the emissions test program.

1.c Source Description

The emissions test program included five plant media heaters, five reciprocating internal combustion engines, and two gas turbines. Each unit is fired exclusively by natural gas.

[1] It should be noted that although CO testing was conducted on the emission units designated EUPLANT101, EUENGINE1, and EUENGINE2, these units do not have corresponding CO emission limitations and CO testing was not required.

1.d Test Program Contacts

The contacts for the source and test report is:

Ms. Lori Myott
Project Manager
NTH Consultants, Ltd
608 S. Washington Avenue
Lansing, Michigan 48933
(517) 702-2957
lmyott@nthconsultants.com

Mr. David Bennett
Operations Supervisor
DCP Antrim Gas, LLC
6250 Old State Road
Johannesburg, Michigan 49751
(989) 939-8360
dbennett@dcpmidstream.com

Names and affiliations for personnel who were present during the testing program are summarized by Table 2.

2. Summary of Results

Sections 2.a through 2.d summarize the results of the emissions compliance test program.

2.a Operating Data

Process operating data collected during the emissions test program is included in Appendix B.

2.b Applicable Permit

The applicable permit for this emissions test program is MDEQ ROP No. MI-ROP-N2940-2009a.

2.c Results

The overall results of the emission test program are summarized by Table 1 (see Section 5.a).

3. Source Description

Sections 3.a through 3.e provide a detailed description of the process.

3.a Process Description

The emissions test program included five plant media heaters, five reciprocating internal combustion engines, and two gas turbines. Each unit is fired exclusively by natural gas.

3.b Process Flow Diagram

Due to the simplicity of the engine, a process flow diagram is not necessary.

3.c Raw and Finished Materials

The raw material used by the processes is natural gas.

3.d Process Capacity

The rated capacity of each emission unit is summarized by Table 3.

3.e Process Instrumentation

Process operating data collected during the emissions test program is included in Appendix B.

4. Sampling and Analytical Procedures

Sections 4.a through 4.d provide a summary of the sampling and analytical procedures used.

4.a Sampling Train and Field Procedures

Sampling and analysis procedures followed the methodologies of the following emissions test methods codified at Title 40, Part 60, Appendix A of the Code of Federal Regulations (40 CFR 60, Appendix A):

- Method 1 - *"Sample and Velocity Traverses for Stationary Sources"* was used to determine sampling and traverse point locations
- Method 2 - *"Determination of Stack Gas Velocity and Volumetric Flowrate"* was used to measure exhaust gas flowrates.
- Method 3A - *"Determination of Oxygen and Carbon Dioxide Concentrations in Emissions from Stationary Sources"* was used to evaluate the O_2 and CO_2 content of the exhaust gas
- Method 4 - *"Determination of Moisture Content in Stack Gases"* was used to evaluate the moisture content of the engine exhaust
- Method 7E - *"Determination of Nitrogen Oxides Emissions from Stationary Sources"* was used to measure NOx concentrations in the exhaust gas

- Method 10 - *"Determination of Carbon Monoxide Emissions from Stationary Sources"* was used to measure CO concentrations in the exhaust gas

- Method 320 - *"Measurement of vapor phase organic and inorganic emissions by extractive Fourier Transform Infrared Spectroscopy"* was used to measure CO, NOx, CO_2, and moisture concentrations in the exhaust gas from EUENGINE1 and EUENGINE2

Stack gas velocity traverses were conducted in accordance with the procedures outlined in Methods 1 and 2. S-type pitot tubes with thermocouple assemblies, calibrated in accordance with Method 2, Section 4.1.1, were used to measure exhaust gas velocity pressures (using a manometer) and temperatures during testing.

Cyclonic flow checks were performed at each sampling location. The existence of cyclonic flow is determined by measuring the flow angle at each sample point. The flow angle is the angle between the direction of flow and the axis of the stack. If the average of the absolute values of the flow angles is greater than 20 degrees, cyclonic flow exists.

Exhaust gas moisture content was evaluated using Method 4. Exhaust gas was extracted and passed through (i) two impingers, each with 100 ml deionized water, (ii) an empty impinger, and (iii) an impinger filled with silica gel. Exhaust gas moisture content was then determined gravimetrically.

The O_2 content was measured using a M&C Products PMA 100-L O_2 gas analyzer (or equivalent) and the CO_2 concentration was measured using a Teledyne 300EM CO_2 gas analyzer (or equivalent). The NOx content of the gas stream was measured using a TECO Model 42hi NOx gas analyzer (or equivalent). The CO content of the gas stream was measured using a TECO Model 48i CO gas analyzer. A sample of the gas stream was drawn through an insulated stainless-steel probe with an in-line glass fiber filter to remove any particulate, a heated Teflon® sample line, and through an electronic sample conditioner to remove the moisture from the sample before it enters the analyzers. Data was recorded at 4-second intervals on a PC equipped with data acquisition software.

For analyzer calibrations, calibration gases were mixed to desired concentrations using an Environics Series 4040 Computerized Gas Dilution System. The Series 4040 consists of a single chassis with four mass flow controllers. The mass flow controllers are factory-calibrated using a primary flow standard traceable to the United State's National Institute of Standards and Technology (NIST). Each flow controller utilizes an 11 point calibration table with linear interpolation, to increase accuracy and reduce flow controller nonlinearity.

All analyzers were calibrated in accordance with the procedures of Methods 3A, 7E, and 10. An exhaust gas stratification test utilizing Method 1 sampling points was conducted during the first test run on each stack and using the procedures of Method 7E or, for the reciprocating engines, followed the procedures of 40 CFR 60, Subparts IIII and JJJJ.

4.b Recovery and Analytical Procedures

This test program did not include laboratory samples, consequently, sample recovery and analysis is not applicable to this test program.

4.c Sampling Ports

Sampling ports were installed on each stack that met the minimum requirements of Method 1.

4.d Traverse Points

Each exhaust stack was traversed at the minimum Method 1 sampling points.

5. Test Results and Discussion

Sections 5.a through 5.k provide a summary of the test results.

5.a Results Tabulation

The overall results of the emissions test program are summarized by Table 1. Detailed results for the emissions test program are summarized by Tables 4 through 13.

5.b Discussion of Results

As summarized by Table 1, each emission test result was less than the corresponding emission limitation with the exception of the CO mass emission rate from EUP5TUR01.

5.c Sampling Procedure Variations

Sampling procedure variations for this emissions test program were as follows:

- Testing of EUP5TUR02 was initiated on May 29, 2014, however, the exhaust gas velocity pressure at some traverse points exceeded ten inches of water and was greater than the range of the manometer used. Consequently, the testing was aborted and EUP5TUR01 and EUP5TUR02 testing was completed on June 5, 2014 after new test ports were installed on a larger section of the exhaust ductwork.
- Testing of EUENGINE1 was initiated on May 30, 2014, however, the NOx analyzer was producing erroneous data and could not pass calibration after the test run. Consequently, the testing was aborted and EUENGINE1 and EUENGINE2 testing was completed on June 26 and 27, 2014 using Method 320 instead of Methods 7E and 10.
- During testing of the EUPLANT101 heater, the CO concentration exceeded the span of the analyzer and, consequently, CO concentration data for the EUPLANT101 heater is not quality assured.

Test data collected for the aborted testing of EUP5TUR02 and EUENGINE1 is provided in Appendix C.

5.d Process or Control Device Upsets

No upset conditions occurred during testing.

5.e Control Device Maintenance

There was no control equipment maintenance performed during the emissions test program.

5.f Re-Test

The emissions test program was not a re-test.

5.g Audit Sample Analyses

No audit samples were collected as part of the test program.

5.h Calibration Sheets

Relevant equipment calibration documents are provided in Appendix D.

5.i Sample Calculations

Sample calculations are provided in Appendix E.

5.j Field Data Sheets

Field documents relevant to the emissions test program are presented in Appendix F.

5.k Laboratory Data

Raw CEM data is provided electronically in Appendix G.

TABLES

Table 1
Overall Emission Test Results Summary
DCP Antrim Gas, LLC
Johannesburg, Michigan

#	Test Date	Unit	Average NOx Emission Rate (pph)	NOx Emission Limit (pph)	Average CO Emission Rate (pph)	CO Emission Limit (pph)
1	6/25/2014	Plant 1 Heat Media Heater (EUPLANT101)	2.9	5.6	3.8	-
2	6/25/2014	Plant 2 Heat Media Heater (EUPLANT201)	4.8	5.2	0.0	3.0
3	6/24/2014	Plant 3 Heat Media Heater (EUPLANT301)	3.8	5.2	0.0	3.0
4	6/24/2014	Plant 4 Heat Media Heater (EUPLANT401)	3.8	5.2	0.0	3.0
5	6/23/2014	Plant 5 Heat Media Heater (EUPLANT501)	4.7	5.2	0.0	3.0
6	5/28/2014	Plant Generator 6 (EUGEN06)	1.8	5.5	2.7	4.0
7	-	Plant Generator 7 (EUGEN07), will not run until 2015	-	5.5	-	4.0
8	5/29/2014	Plant Generator 8 (EUGEN08)	3.1	5.5	2.4	4.0
9	5/28/2014	Plant Generator 9 (EUGEN09)	1.1	5.5	2.2	4.0
10	6/26/2014	Plant 6 Engine 1 (EUENGINE1)	Results to be submitted in separate test report			
11	6/27/2014	Plant 6 Engine 2 (EUENGINE2)	Results to be submitted in separate test report			
12	6/5/2014	Turbine 1 (EUP5TUR01)	14.5	17.1	2.6	2.3
13	6/5/2014	Turbine 2 (EUP5TUR02)	13.9	17.1	2.2	2.3

*Plant 6 Engines 1 and 2 were tested on June 26 and 27, 2014. Test results will be reported in a separate test report does not include CO emission limitations for the Plant 1 media heater or for Plant 6 Engines 1 and 2.
In addition, the two turbines also have NOx and CO emission limits of 167 ppmvd@15% O_2
And 50 ppmvd@15% O2, respectively. Concentration-based results for the two turbines are as follows:

12	6/5/2014	Turbine 1 (EUP5TUR01)	81	167	24	50
13	6/5/2014	Turbine 2 (EUP5TUR02)	83	167	22	50

Table 2
Test Personnel

Name and Title	Affiliation	Telephone
Mr. David Bennett Operations Supervisor	DCP Antrim Gas, LLC 6250 Old State Road Johannesburg, Michigan 49751	(989) 939-8360
Mr. Matthew L. Young Senior Project Manager	BTEC 4949 Fernlee Avenue Royal Oak, MI 48073	(248) 548-8070
Mr. Peter Hilty Senior Project Manager	BTEC 4949 Fernlee Avenue Royal Oak, MI 48073	(248) 548-8070
Mr. Ken Lievense Project Manager	BTEC 4949 Fernlee Avenue Royal Oak, MI 48073	(248) 548-8070
Mr. Paul Draper Environmental Technician	BTEC 4949 Fernlee Avenue Royal Oak, MI 48073	(248) 548-8070
Mr. Paul Diven Environmental Technician	BTEC 4949 Fernlee Avenue Royal Oak, MI 48073	(248) 548-8070
Mr. Steve Smith Environmental Technician	BTEC 4949 Fernlee Avenue Royal Oak, MI 48073	(248) 548-8070
Mr. Tom Gasloli Environmental Quality Analyst	MDEQ Air Quality Division	(517) 284-6778
Mr. Shane Nixon Environmental Engineer	MDEQ Air Quality Division	(231) 876-4413

Table 3
DCP Antrim Gas
Equipment Rated Capacities Summary

#	Unit	Process Rating	Process Rating Units
1	Plant 1 Heat Media Heater (EUPLANT101)	40	MMBtu/hr
2	Plant 2 Heat Media Heater (EUPLANT201)	51.23	MMBtu/hr
3	Plant 3 Heat Media Heater (EUPLANT301)	51.23	MMBtu/hr
4	Plant 4 Heat Media Heater (EUPLANT401)	51.23	MMBtu/hr
5	Plant 5 Heat Media Heater (EUPLANT501)	51.23	MMBtu/hr
6	Plant Generator 6 (EUGEN06)	1,150	hp
7	Plant Generator 7 (EUGEN07), will not run until 2015	1,150	hp
8	Plant Generator 8 (EUGEN08)	1,150	hp
9	Plant Generator 9 (EUGEN09)	1,150	hp
10	Plant 6 Engine 1 (EUENGINE1)	930	hp
11	Plant 6 Engine 2 (EUENGINE2)	930	hp
12	Turbine 1 (EUP5TUR01)	3,505	kW
13	Turbine 2 (EUP5TUR02)	3,505	kW

Table 4
Heater 1 NOx, CO Emission Rates
DCP Antrim Gas
Johannesburg, MI
BTEC Project No. 14-4553.00
Sampling Date: 6/25/14

Parameter	Run 1	Run 2	Run 3	Average
Test Run Date	6/25/2014	6/25/2014	6/25/2014	
Test Run Time	12:45-13:45	14:00-15:00	15:10-16:10	
Outlet Flowrate (dscfm)	11,810	12,274	13,293	**12,459**
Oxygen Concentration (%)	11.30	11.28	11.22	**11.27**
Oxygen Concentration (%, drift corrected as per USEPA 7E)	11.40	11.40	11.34	**11.38**
Carbon Dioxide Concentration (%)	5.53	5.50	5.50	**5.51**
Carbon Dioxide Concentration (%, drift corrected as per USEPA 7E)	5.52	5.50	5.51	**5.51**
Outlet Oxides of Nitrogen Concentration (ppmv)	30.81	32.04	32.80	**31.88**
Outlet NOx Concentration (ppmv, corrected as per USEPA 7E)	32.06	32.62	33.59	**32.76**
NOx Emission Rate (lb/hr) (corrected as per USEPA 7E)	**2.71**	**2.87**	**3.20**	**2.93**
Outlet Carbon Monoxide Concentration (ppmv)	69.91	71.49	67.60	**69.67**
Outlet CO Concentration (ppmv, corrected as per USEPA 7E)	70.75	72.78	68.99	**70.84**
CO Emission Rate (lb/hr) (corrected as per USEPA 7E)*	**3.63**	**3.88**	**3.99**	**3.83**

O_2 Correction			
Co	0.18	0.15	0.15
Cma	10.1	10.1	10.1
Cm	10.03	10.01	10.01

CO_2 Correction			
Co	0.11	0.13	0.12
Cma	10	10	10
Cm	9.93	9.90	9.89

NOx Correction			
Co	0.58	1.12	1.10
Cma	50.7	50.7	50.7
Cm	48.39	49.18	48.95

CO Correction			
Co	-1.94	-1.65	-1.70
Cma	50.2	50.2	50.2
Cm	49.04	48.80	48.73

***Some CO concentration data was above the range of the analyzer and, consequently, the CO concentration data is not quality assured.**

ppmv = parts per million on a volume-to-volume basis
lb/hr = pounds per hour
MW = molecular weight (CO = 28.01, NOx = 46.01, SO_2 = 64.05, C_3H_8 = 44.10, carbon = 12.01)
24.14 = molar volume of air at standard conditions (70°F, 29.92" Hg)
35.31 = ft^3 per m^3
453600 = mg per lb

Co= Average of initial and final zero gases
Cma=Actual concentration of the calibration gas
Cm= Average of initial and final calibration gases
C_c=KC_{meas}
where Cc = Concentration as Carbon (ppmv), K= Carbon equivalent correction factor (3 for Propane)
and C_{meas} = concentration as measured (as propane)
[1]emission rate calculated on dry basis
[2]emission rate calculated on wet basis

Equations
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * *scfm* * 60 *for* VOC
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * *dcfm* * 60
$Conc_{@15\%O2}$ = Conc * (20.9 -15)/(20.9 - $\%O_2$)

Table 5
Heater 2 NOx, CO Emission Rates
DCP Antrim Gas
Johannesburg, MI
BTEC Project No. 14-4553.00
Sampling Date: 6/25/14

Parameter	Run 1	Run 2	Run 3	Average
Test Run Date	6/25/2014	6/25/2014	6/25/2014	
Test Run Time	7:35-8:35	9:05-10:05	10:15-11:15	
Outlet Flowrate (dscfm)	16,247	16,184	16,666	**16,366**
Oxygen Concentration (%)	7.29	7.32	7.34	**7.32**
Oxygen Concentration (%, drift corrected as per USEPA 7E)	7.32	7.33	7.35	**7.34**
Carbon Dioxide Concentration (%)	9.03	8.99	8.97	**9.00**
Carbon Dioxide Concentration (%, drift corrected as per USEPA 7E)	9.18	9.10	9.09	**9.12**
Outlet Oxides of Nitrogen Concentration (ppmv)	38.75	39.04	39.24	**39.01**
Outlet NOx Concentration (ppmv, corrected as per USEPA 7E)	40.81	41.06	41.46	**41.11**
NOx Emission Rate (lb/hr) (corrected as per USEPA 7E)	**4.75**	**4.76**	**4.95**	**4.82**
Outlet Carbon Monoxide Concentration (ppmv)	-0.09	-0.11	-0.15	**-0.12**
Outlet CO Concentration (ppmv, corrected as per USEPA 7E)	-0.29	-0.21	-0.34	**-0.28**
CO Emission Rate (lb/hr) (corrected as per USEPA 7E)*	**-0.02**	**-0.01**	**-0.02**	**-0.02**

O_2 Correction			
Co	0.16	0.16	0.16
Cma	10.1	10.1	10.1
Cm	10.00	10.02	10.03

CO_2 Correction			
Co	0.08	0.11	0.11
Cma	10	10	10
Cm	9.84	9.87	9.86

NOx Correction			
Co	0.28	0.42	0.36
Cma	50.7	50.7	50.7
Cm	48.08	48.11	47.91

CO Correction			
Co	0.20	0.11	0.20
Cma	24.26	24.26	24.26
Cm	24.69	24.91	24.87

***All CO concentration and emission rate data is considered to be zero.**

ppmv = parts per million on a volume-to-volume basis
lb/hr = pounds per hour
MW = molecular weight (CO = 28.01, NOx = 46.01, SO_2 = 64.05, C_3H_8 = 44.10, carbon = 12.01)
24.14 = molar volume of air at standard conditions (70°F, 29.92" Hg)
35.31 = ft^3 per m^3
453600 = mg per lb

Co= Average of initial and final zero gases
Cma=Actual concentration of the calibration gas
Cm= Average of initial and final calibration gases
$C_c=KC_{meas}$
where Cc = Concentration as Carbon (ppmv), K= Carbon equivalent correction factor (3 for Propane)
and C_{meas} = concentration as measured (as propane)
[1]emission rate calculated on dry basis
[2]emission rate calculated on wet basis

Equations
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * *scfm* * 60 *for* VOC
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * *dcfm* * 60
$Conc_{@15\%O2}$ = Conc * (20.9 -15)/(20.9 - $\%O_2$)

Table 6
Heater 3 NOx, CO Emission Rates
DCP Antrim Gas
Johannesburg, MI
BTEC Project No. 14-4553.00
Sampling Date: 6/24/14

Parameter	Run 1	Run 2	Run 3	Average
Test Run Date	6/24/2014	6/24/2014	6/24/2014	
Test Run Time	12:11-13:11	13:25-14:25	14:40-15:40	
Outlet Flowrate (dscfm)	14,013	13,644	14,001	**13,886**
Oxygen Concentration (%)	6.55	6.48	6.40	**6.48**
Oxygen Concentration (%, drift corrected as per USEPA 7E)	6.62	6.54	6.47	**6.54**
Carbon Dioxide Concentration (%)	9.38	9.43	9.55	**9.45**
Carbon Dioxide Concentration (%, drift corrected as per USEPA 7E)	9.61	9.63	9.75	**9.66**
Outlet Oxides of Nitrogen Concentration (ppmv)	35.90	36.01	35.86	**35.92**
Outlet NOx Concentration (ppmv, corrected as per USEPA 7E)	38.02	38.01	37.97	**38.00**
NOx Emission Rate (lb/hr) (corrected as per USEPA 7E)	**3.82**	**3.71**	**3.81**	**3.78**
Outlet Carbon Monoxide Concentration (ppmv)	-0.05	-0.04	-0.11	**-0.07**
Outlet CO Concentration (ppmv, corrected as per USEPA 7E)	0.00	-0.15	-0.27	**-0.14**
CO Emission Rate (lb/hr) (corrected as per USEPA 7E)*	**0.00**	**-0.01**	**-0.02**	**-0.01**

O_2 Correction			
Co	0.10	0.09	0.09
Cma	10.1	10.1	10.1
Cm	9.95	9.96	9.95

CO_2 Correction			
Co	0.11	0.13	0.16
Cma	10	10	10
Cm	9.76	9.79	9.79

NOx Correction			
Co	0.29	0.34	0.29
Cma	50.7	50.7	50.7
Cm	47.78	47.93	47.79

CO Correction			
Co	-0.06	0.11	0.17
Cma	24.26	24.26	24.26
Cm	25.01	25.03	25.00

***All CO concentration and emission rate data is considered to be zero.**

ppmv = parts per million on a volume-to-volume basis
lb/hr = pounds per hour
MW = molecular weight (CO = 28.01, NOx = 46.01, SO_2 = 64.05, C_3H_8 = 44.10, carbon = 12.01)
24.14 = molar volume of air at standard conditions (70°F, 29.92" Hg)
35.31 = ft^3 per m^3
453600 = mg per lb

Co= Average of initial and final zero gases
Cma=Actual concentration of the calibration gas
Cm= Average of initial and final calibration gases
$C_c = KC_{meas}$
where Cc = Concentration as Carbon (ppmv), K= Carbon equivalent correction factor (3 for Propane)
and C_{meas} = concentration as measured (as propane)
[1]emission rate calculated on dry basis
[2]emission rate calculated on wet basis

Equations
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * *scfm* * 60 *for* VOC
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * *dcfm* * 60
$Conc_{@15\%O2}$ = Conc * (20.9 -15)/(20.9 - $\%O_2$)

Table 7
Heater 4 NOx, CO Emission Rates
DCP Antrim Gas
Johannesburg, MI
BTEC Project No. 14-4553.00
Sampling Date: 6/24/14

Parameter	Run 1	Run 2	Run 3	Average
Test Run Date	6/24/2014	6/24/2014	6/24/2014	
Test Run Time	7:30-8:30	8:45-9:45	9:55-10:55	
Outlet Flowrate (dscfm)	15,389	16,911	13,247	**15,182**
Oxygen Concentration (%)	5.99	6.13	6.12	**6.08**
Oxygen Concentration (%, drift corrected as per USEPA 7E)	6.03	6.17	6.16	**6.12**
Carbon Dioxide Concentration (%)	9.80	9.60	9.58	**9.66**
Carbon Dioxide Concentration (%, drift corrected as per USEPA 7E)	9.97	9.79	9.79	**9.85**
Outlet Oxides of Nitrogen Concentration (ppmv)	33.37	32.41	32.62	**32.80**
Outlet NOx Concentration (ppmv, corrected as per USEPA 7E)	35.09	34.18	34.47	**34.58**
NOx Emission Rate (lb/hr) (corrected as per USEPA 7E)	**3.87**	**4.14**	**3.27**	**3.76**
Outlet Carbon Monoxide Concentration (ppmv)	-0.10	-0.19	-0.16	**-0.15**
Outlet CO Concentration (ppmv, corrected as per USEPA 7E)	-0.15	-0.20	-0.21	**-0.18**
CO Emission Rate (lb/hr) (corrected as per USEPA 7E)*	**-0.01**	**-0.01**	**-0.01**	**-0.01**

O_2 Correction			
Co	0.11	0.11	0.11
Cma	10.1	10.1	10.1
Cm	9.96	9.96	9.96

CO_2 Correction			
Co	0.12	0.14	0.13
Cma	10	10	10
Cm	9.83	9.81	9.78

NOx Correction			
Co	0.19	0.25	0.25
Cma	50.7	50.7	50.7
Cm	48.13	47.95	47.86

CO Correction			
Co	0.05	0.02	0.05
Cma	24.26	24.26	24.26
Cm	24.83	24.80	24.81

***All CO concentration and emission rate data is considered to be zero.**

ppmv = parts per million on a volume-to-volume basis
lb/hr = pounds per hour
MW = molecular weight (CO = 28.01, NOx = 46.01, SO_2 = 64.05, C_3H_8 = 44.10, carbon = 12.01)
24.14 = molar volume of air at standard conditions (70°F, 29.92" Hg)
35.31 = ft^3 per m^3
453600 = mg per lb

Co= Average of initial and final zero gases
Cma=Actual concentration of the calibration gas
Cm= Average of initial and final calibration gases
$C_c=KC_{meas}$
where Cc = Concentration as Carbon (ppmv), K= Carbon equivalent correction factor (3 for Propane)
and C_{meas} = concentration as measured (as propane)
[1]emission rate calculated on dry basis
[2]emission rate calculated on wet basis

Equations
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * *scfm* * 60 *for* VOC
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * *dcfm* * 60
$Conc_{@15\%O2}$ = Conc * (20.9 -15)/(20.9 - $\%O_2$)

Table 8
Heater 5 NOx, CO Emission Rates
DCP Antrim Gas
Johannesburg, MI
BTEC Project No. 14-4553.00
Sampling Date: 6/23/14

Parameter	Run 1	Run 2	Run 3	Average
Test Run Date	6/23/2014	6/23/2014	6/23/2014	
Test Run Time	12:45-13:45	14:00-15:00	15:25-16:25	
Outlet Flowrate (dscfm)	13,807	12,244	12,379	**12,810**
Oxygen Concentration (%)	4.19	4.36	4.22	**4.26**
Oxygen Concentration (%, drift corrected as per USEPA 7E)	4.18	4.38	4.26	**4.27**
Carbon Dioxide Concentration (%)	11.11	11.00	11.14	**11.08**
Carbon Dioxide Concentration (%, drift corrected as per USEPA 7E)	11.15	10.95	11.06	**11.05**
Outlet Oxides of Nitrogen Concentration (ppmv)	50.28	49.13	48.76	**49.39**
Outlet NOx Concentration (ppmv, corrected as per USEPA 7E)	52.22	50.53	50.40	**51.05**
NOx Emission Rate (lb/hr) (corrected as per USEPA 7E)	**5.16**	**4.43**	**4.47**	**4.69**
Outlet Carbon Monoxide Concentration (ppmv)	0.11	-0.26	0.79	**0.21**
Outlet CO Concentration (ppmv, corrected as per USEPA 7E)	0.06	-0.27	0.73	**0.17**
CO Emission Rate (lb/hr) (corrected as per USEPA 7E)*	**0.00**	**-0.01**	**0.04**	**0.01**

O_2 Correction			
Co	0.12	0.09	0.07
Cma	10.1	10.1	10.1
Cm	9.95	9.94	9.92

CO_2 Correction			
Co	0.16	0.24	0.29
Cma	10	10	10
Cm	9.98	10.07	10.10

NOx Correction			
Co	0.18	0.24	0.27
Cma	50.7	50.7	50.7
Cm	48.83	49.30	49.05

CO Correction			
Co	0.05	0.02	0.05
Cma	24.26	24.26	24.26
Cm	24.83	24.80	24.81

***Run 2 CO concentration and emission rate data is considered to be zero.**

ppmv = parts per million on a volume-to-volume basis
lb/hr = pounds per hour
MW = molecular weight (CO = 28.01, NOx = 46.01, SO_2 = 64.05, C_3H_8 = 44.10, carbon = 12.01)
24.14 = molar volume of air at standard conditions (70°F, 29.92" Hg)
35.31 = ft^3 per m^3
453600 = mg per lb

Co= Average of initial and final zero gases
Cma=Actual concentration of the calibration gas
Cm= Average of initial and final calibration gases
$C_c = KC_{meas}$
where Cc = Concentration as Carbon (ppmv), K= Carbon equivalent correction factor (3 for Propane)
and C_{meas} = concentration as measured (as propane)
[1]emission rate calculated on dry basis
[2]emission rate calculated on wet basis

Equations
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * ***scfm*** * 60 *for* VOC
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * ***dcfm*** * 60
$Conc_{@15\%O2}$ = Conc * (20.9 -15)/(20.9 - $\%O_2$)

Table 9
Engine 6 NOx, CO Emission Rates
DCP Antrim Gas
Johannesburg, MI
BTEC Project No. 14-4553.00
Sampling Date: 5/28/14

Parameter	Run 1	Run 2	Run 3	Average
Test Run Date	5/28/2014	5/28/2014	5/28/2014	
Test Run Time	14:05-15:05	15:16-16:16	16:27-17:27	
Outlet Flowrate (dscfm)	1,459	1,509	1,552	**1,507**
Oxygen Concentration (%)	9.06	9.06	9.06	**9.06**
Oxygen Concentration (%, drift corrected as per USEPA 7E)	9.13	9.12	9.14	**9.13**
Carbon Dioxide Concentration (%)	7.64	7.65	7.62	**7.64**
Carbon Dioxide Concentration (%, drift corrected as per USEPA 7E)	7.74	7.76	7.75	**7.75**
Outlet Oxides of Nitrogen Concentration (ppmv)	146.08	152.28	148.56	**148.97**
Outlet NOx Concentration (ppmv, corrected as per USEPA 7E)	160.54	167.36	162.36	**163.42**
NOx Emission Rate (lb/hr) (corrected as per USEPA 7E)	**1.68**	**1.81**	**1.81**	**1.76**
Outlet Carbon Monoxide Concentration (ppmv)	387.39	391.65	393.13	**390.72**
Outlet CO Concentration (ppmv, corrected as per USEPA 7E)	394.53	398.86	419.96	**404.45**
CO Emission Rate (lb/hr) (corrected as per USEPA 7E)	**2.50**	**2.62**	**2.83**	**2.65**

O_2 Correction			
Co	0.18	0.18	0.17
Cma	9.95	9.95	9.95
Cm	9.86	9.87	9.85

CO_2 Correction			
Co	0.12	0.12	0.11
Cma	9.85	9.85	9.85
Cm	9.70	9.68	9.66

NOx Correction			
Co	1.70	1.68	1.39
Cma	199	199	199
Cm	180.67	180.75	181.78

CO Correction			
Co	3.15	3.19	2.88
Cma	449	449	449
Cm	440.45	440.48	420.12

ppmv = parts per million on a volume-to-volume basis
lb/hr = pounds per hour
MW = molecular weight (CO = 28.01, NOx = 46.01, SO_2 = 64.05, C_3H_8 = 44.10, carbon = 12.01)
24.14 = molar volume of air at standard conditions (70°F, 29.92" Hg)
35.31 = ft^3 per m^3
453600 = mg per lb

Co= Average of initial and final zero gases
Cma=Actual concentration of the calibration gas
Cm= Average of initial and final calibration gases
$C_c=KC_{meas}$
where Cc = Concentration as Carbon (ppmv), K= Carbon equivalent correction factor (3 for Propane)
and C_{meas} = concentration as measured (as propane)
[1]emission rate calculated on dry basis
[2]emission rate calculated on wet basis

Equations
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * *scfm* * 60 *for* VOC
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * *dcfm* * 60
$Conc_{@15\%O2}$ = Conc * (20.9 -15)/(20.9 - $\%O_2$)

Table 10
Engine 8 NOx, CO Emission Rates
DCP Antrim Gas
Johannesburg, MI
BTEC Project No. 14-4553.00
Sampling Date: 5/29/14

Parameter	Run 1	Run 2	Run 3	Average
Test Run Date	5/29/2014	5/29/2014	5/29/2014	
Test Run Time	9:19-10:19	10:34-11:34	11:57-12:57	
Outlet Flowrate (dscfm)	1,359	1,487	1,478	**1,441**
Oxygen Concentration (%)	7.98	7.97	7.94	**7.96**
Oxygen Concentration (%, drift corrected as per USEPA 7E)	8.01	8.02	7.96	**8.00**
Carbon Dioxide Concentration (%)	8.31	8.32	8.34	**8.32**
Carbon Dioxide Concentration (%, drift corrected as per USEPA 7E)	8.44	8.48	8.49	**8.47**
Outlet Oxides of Nitrogen Concentration (ppmv)	248.36	278.14	319.69	**282.06**
Outlet NOx Concentration (ppmv, corrected as per USEPA 7E)	264.71	297.60	333.96	**298.76**
NOx Emission Rate (lb/hr) (corrected as per USEPA 7E)	**2.58**	**3.17**	**3.54**	**3.09**
Outlet Carbon Monoxide Concentration (ppmv)	375.93	385.18	394.44	**385.18**
Outlet CO Concentration (ppmv, corrected as per USEPA 7E)	373.70	386.13	395.34	**385.06**
CO Emission Rate (lb/hr) (corrected as per USEPA 7E)	**2.21**	**2.50**	**2.54**	**2.41**

O_2 Correction			
Co	0.10	0.10	0.11
Cma	9.95	9.95	9.95
Cm	9.89	9.87	9.90

CO_2 Correction			
Co	0.07	0.08	0.08
Cma	9.85	9.85	9.85
Cm	9.69	9.65	9.67

NOx Correction			
Co	2.32	3.77	3.81
Cma	149	149	149
Cm	140.81	141.14	144.75

CO Correction			
Co	3.43	4.07	3.26
Cma	448	448	448
Cm	450.00	446.25	446.55

ppmv = parts per million on a volume-to-volume basis
lb/hr = pounds per hour
MW = molecular weight (CO = 28.01, NOx = 46.01, SO_2 = 64.05, C_3H_8 = 44.10, carbon = 12.01)
24.14 = molar volume of air at standard conditions (70°F, 29.92" Hg)
35.31 = ft^3 per m^3
453600 = mg per lb

Co= Average of initial and final zero gases
Cma=Actual concentration of the calibration gas
Cm= Average of initial and final calibration gases
C_c=KC_{mcas}
where Cc = Concentration as Carbon (ppmv), K= Carbon equivalent correction factor (3 for Propane)
and C_{mcas} = concentration as measured (as propane)
[1]emission rate calculated on dry basis
[2]emission rate calculated on wet basis

Equations
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * ***scfm*** * 60 *for* VOC
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * ***dcfm*** * 60
$Conc_{@15\%O2}$ = Conc * (20.9 -15)/(20.9 - $\%O_2$)

Table 11
Engine 9 NOx, CO Emission Rates
DCP Antrim Gas
Johannesburg, MI
BTEC Project No. 14-4553.00
Sampling Date: 5/28/14

Parameter	Run 1	Run 2	Run 3	Average
Test Run Date	5/28/2014	5/28/2014	5/28/2014	
Test Run Time	9:40-10:40	11:00-12:00	12:20-13:20	
Outlet Flowrate (dscfm)	1,598	1,583	1,585	**1,589**
Oxygen Concentration (%)	8.23	8.31	8.32	**8.29**
Oxygen Concentration (%, drift corrected as per USEPA 7E)	8.28	8.38	8.39	**8.35**
Carbon Dioxide Concentration (%)	8.15	8.12	8.12	**8.13**
Carbon Dioxide Concentration (%, drift corrected as per USEPA 7E)	8.19	8.26	8.27	**8.24**
Outlet Oxides of Nitrogen Concentration (ppmv)	93.11	85.54	86.86	**88.50**
Outlet NOx Concentration (ppmv, corrected as per USEPA 7E)	96.32	92.08	95.27	**94.56**
NOx Emission Rate (lb/hr) (corrected as per USEPA 7E)	**1.10**	**1.04**	**1.08**	**1.08**
Outlet Carbon Monoxide Concentration (ppmv)	312.33	309.82	311.71	**311.29**
Outlet CO Concentration (ppmv, corrected as per USEPA 7E)	311.24	311.39	316.93	**313.19**
CO Emission Rate (lb/hr) (corrected as per USEPA 7E)	**2.16**	**2.14**	**2.18**	**2.16**

O_2 Correction			
Co	0.16	0.16	0.17
Cma	9.95	9.95	9.95
Cm	9.86	9.84	9.84

CO_2 Correction			
Co	0.09	0.12	0.12
Cma	9.85	9.85	9.85
Cm	9.78	9.67	9.66

NOx Correction			
Co	0.75	0.69	1.47
Cma	199	199	199
Cm	191.57	184.08	179.83

CO Correction			
Co	1.94	1.82	2.65
Cma	449	449	449
Cm	449.71	445.93	440.51

ppmv = parts per million on a volume-to-volume basis
lb/hr = pounds per hour
MW = molecular weight (CO = 28.01, NOx = 46.01, SO_2 = 64.05, C_3H_8 = 44.10, carbon = 12.01)
24.14 = molar volume of air at standard conditions (70°F, 29.92" Hg)
35.31 = ft^3 per m^3
453600 = mg per lb

Co= Average of initial and final zero gases
Cma=Actual concentration of the calibration gas
Cm= Average of initial and final calibration gases
$C_c = KC_{meas}$
where Cc = Concentration as Carbon (ppmv), K= Carbon equivalent correction factor (3 for Propane)
and C_{meas} = concentration as measured (as propane)
[1]emission rate calculated on dry basis
[2]emission rate calculated on wet basis

Equations
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * *scfm* * 60 *for* VOC
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * *dcfm* * 60
$Conc_{@15\%O2} = Conc * (20.9 - 15)/(20.9 - \%O_2)$

Table 12
Turbine 1 NOx, CO Emission Rates
DCP Antrim Gas
Johannesburg, MI
BTEC Project No. 14-4553.00
Sampling Date: 6/5/14

Parameter	Run 1	Run 2	Run 3	Average
Test Run Date	6/5/2014	6/5/2014	6/5/2014	
Test Run Time	13:39-14:00	14:24-14:45	15:17-15:38	
Outlet Flowrate (dscfm)	34,239	35,543	34,022	**34,601**
Oxygen Concentration (%)	17.14	17.07	17.46	**17.22**
Oxygen Concentration (%, drift corrected as per USEPA 7E)	16.92	16.64	16.42	**16.66**
Carbon Dioxide Concentration (%)	2.12	2.17	1.95	**2.08**
Carbon Dioxide Concentration (%, drift corrected as per USEPA 7E)	2.22	2.31	2.08	**2.20**
Outlet Oxides of Nitrogen Concentration (ppmv)	56.42	57.38	51.32	**55.04**
Outlet NOx Concentration (ppmv, corrected as per USEPA 7E)	60.02	61.00	53.79	**58.27**
NOx Emission Rate (lb/hr) (corrected as per USEPA 7E)	**14.72**	**15.53**	**13.11**	**14.45**
Outlet NOx Concentration (ppmv, corrected to 15% O_2)	**88.92**	**84.48**	**70.87**	**81.43**
Outlet Carbon Monoxide Concentration (ppmv)	18.33	18.55	15.94	**17.61**
Outlet CO Concentration (ppmv, corrected as per USEPA 7E)	17.99	18.17	15.61	**17.25**
CO Emission Rate (lb/hr) (corrected as per USEPA 7E)	**2.68**	**2.81**	**2.31**	**2.60**
Outlet CO Concentration (ppmv, corrected to 15% O_2)	**26.65**	**25.16**	**20.57**	**24.13**

O_2 Correction			
Co	0.27	0.43	0.20
Cma	9.9	9.9	9.9
Cm	10.14	10.33	10.61

CO_2 Correction			
Co	0.03	0.05	0.04
Cma	9.9	9.9	9.9
Cm	9.35	9.15	9.16

NOx Correction			
Co	0.58	0.68	0.64
Cma	50.7	50.7	50.7
Cm	47.75	47.81	48.41

CO Correction			
Co	0.80	0.82	0.81
Cma	50.2	50.2	50.2
Cm	49.72	49.83	49.47

scfm = standard cubic feet per minute
dscfm = dry standard cubic feet per minute
ppmv = parts per million on a volume-to-volume basis
lb/hr = pounds per hour
MW = molecular weight (CO = 28.01, NOx = 46.01, SO_2 = 64.05, C_3H_8 = 44.10, carbon = 12.01)
24.14 = molar volume of air at standard conditions (70°F, 29.92" Hg)
35.31 = ft^3 per m^3
453600 = mg per lb

Co= Average of initial and final zero gases
Cma=Actual concentration of the calibration gas
Cm= Average of initial and final calibration gases
$C_c = KC_{meas}$
where Cc = Concentration as Carbon (ppmv), K= Carbon equivalent correction factor (3 for Propane)
and C_{meas} = concentration as measured (as propane)
[1]emission rate calculated on dry basis
[2]emission rate calculated on wet basis

Equations
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * *scfm* * 60 *for* VOC
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * *dcfm* * 60
$Conc_{@15\%O2}$ = Conc * (20.9 -15)/(20.9 - $\%O_2$)

Table 13
Turbine 2 NOx, CO Emission Rates
DCP Antrim Gas
Johannesburg, MI
BTEC Project No. 14-4553.00
Sampling Date: 6/5/14

Parameter	Run 1	Run 2	Run 3	Average
Test Run Date	6/5/2014	6/5/2014	6/5/2014	
Test Run Time	9:55-10:06	10:57-11:18	11:40-12:01	
Outlet Flowrate (dscfm)	34,522	36,902	35331	**35,585**
Oxygen Concentration (%)	17.04	16.97	16.95	**16.99**
Oxygen Concentration (%, drift corrected as per USEPA 7E)	17.15	16.92	17.00	**17.02**
Carbon Dioxide Concentration (%)	2.28	2.33	2.32	**2.31**
Carbon Dioxide Concentration (%, drift corrected as per USEPA 7E)	2.31	2.38	2.38	**2.36**
Outlet Oxides of Nitrogen Concentration (ppmv)	50.78	51.56	51.96	**51.43**
Outlet NOx Concentration (ppmv, corrected as per USEPA 7E)	53.49	54.93	55.61	**54.68**
NOx Emission Rate (lb/hr) (corrected as per USEPA 7E)	**13.23**	**14.52**	**14.08**	**13.94**
Outlet NOx Concentration (ppmv, corrected to 15% O_2)	**84.11**	**81.47**	**84.07**	**83.22**
Outlet Carbon Monoxide Concentration (ppmv)	18.15	12.70	11.97	**14.27**
Outlet CO Concentration (ppmv, corrected as per USEPA 7E)	18.07	12.75	11.99	**14.27**
CO Emission Rate (lb/hr) (corrected as per USEPA 7E)	**2.71**	**2.05**	**1.84**	**2.20**
Outlet CO Concentration (ppmv, corrected to 15% O_2)	**28.42**	**18.91**	**18.12**	**21.82**

O_2 Correction			
Co	0.42	0.66	0.76
Cma	9.9	9.9	9.9
Cm	10.02	10.20	10.19

CO_2 Correction			
Co	0.00	0.00	0.00
Cma	9.9	9.9	9.9
Cm	9.76	9.70	9.64

NOx Correction			
Co	0.37	0.70	0.93
Cma	50.7	50.7	50.7
Cm	48.16	47.64	47.45

CO Correction			
Co	0.44	0.32	0.40
Cma	50.2	50.2	50.2
Cm	49.64	49.06	48.86

scfm = standard cubic feet per minute
dscfm = dry standard cubic feet per minute
ppmv = parts per million on a volume-to-volume basis
lb/hr = pounds per hour
MW = molecular weight (CO = 28.01, NOx = 46.01, SO_2 = 64.05, C_3H_8 = 44.10, carbon = 12.01)
24.14 = molar volume of air at standard conditions (70°F, 29.92" Hg)
35.31 = ft^3 per m^3
453600 = mg per lb

Co= Average of initial and final zero gases
Cma=Actual concentration of the calibration gas
Cm= Average of initial and final calibration gases
C_c=KC_{meas}
where Cc = Concentration as Carbon (ppmv), K= Carbon equivalent correction factor (3 for Propane)
and C_{meas} = concentration as measured (as propane)
[1]emission rate calculated on dry basis
[2]emission rate calculated on wet basis

Equations
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * *scfm* * 60 *for* VOC
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * *dcfm* * 60
$Conc_{@15\%O2}$ = Conc * (20.9 -15)/(20.9 - $\%O_2$)