BTEC Inc.

Extractor & LFG Engines Emissions Test Report

Prepared for:

Zeeland Farm Services, Inc.

Zeeland, MI

Zeeland Farm Services
2525 84th ave
Zeeland, MI 49464

Project No. 049AS-414762
October 23, 2018

BT Environmental Consulting, Inc.
4949 Fernlee Avenue
Royal Oak, Michigan 48073
(248) 548-8070

EXECUTIVE SUMMARY

BT Environmental Consulting, Inc. (BTEC) was retained by Zeeland Farm Services (ZFS) to evaluate nitrogen oxides (NOx), carbon monoxide (CO), sulfur dioxide (SO_2), formaldehyde (CH_2O), and volatile organic compound (VOC) emission rates from two landfill gas and natural gas-fired reciprocating internal combustion engines at the ZFS facility located in Zeeland, Michigan. In addition, BTEC was retained by ZFS to measure VOC emission rates from one extraction process unit. The two landfill gas and natural gas-fired engines are designated as EULF/NGENGINE1 and EULF/NGENGINE2. The extraction process unit is designated as EUEXTRACTION and the stack tested was SVMAINVENT. The emissions test program was conducted on August 28-30, 2018.

Testing consisted of triplicate 60-minute test runs for NO_x, CO, SO_2, CH_2O, and VOC on each of the two engines, and 60-minute test runs for VOC on the extraction process unit The emissions test program was required by renewable operating permit (MI-ROP-M4204-2012b). The results of the emission test program are summarized by Table I.

Table I
EULF/NGENGINE 1&2, EUEXTRACTION
Test Date: August 28-30, 2018

Pollutant	Emission Rates EULF/NGENGINE 1	Emission Rates EULF/NGENGINE 2	Emission Limits
Oxides of Nitrogen (NOx)	2.35 pph	2.19 pph	4.56 pph
Carbon Monoxide (CO)	10.78 pph	13.38 pph	22.44 pph
Non-Methane Organic Compounds (NMOC)	0.61 pph	1.51 pph	4.02 pph
Formaldehyde (CH_2O)	1.7 pph	2.1 pph	2.8 pph
Sulfur Dioxide (SO_2)	1.58 pph	1.52 pph	2.77 pph
Pollutant	**EUEXTRACTION**		**Emission Limits**
Non-Methane Organic Compounds (NMOC)	0.2 pph		7.12 pph

1. Introduction

BT Environmental Consulting, Inc. (BTEC) was retained by Zeeland Farm Services (ZFS) to evaluate nitrogen oxides (NOx), carbon monoxide (CO), sulfur dioxide (SO_2), formaldehyde (CH_2O), and volatile organic compound (VOC) emission rates from two landfill gas and natural gas-fired reciprocating internal combustion engines at the ZFS facility located in Zeeland, Michigan. In addition, BTEC was retained by ZFS to measure VOC emission rates from one extraction process unit. The two landfill gas and natural gas-fired engines are designated as EULF/NGENGINE1 and EULF/NGENGINE2. The extraction process unit is designated as EUEXTRACTION and the stack tested was SVMAINVENT. The emissions test program was conducted on August 28-30, 2018.

AQD has published a guidance document entitled "Format for Submittal of Source Emission Test Plans and Reports" (December 2013). The following is a summary of the emissions test program and results in the format suggested by the aforementioned document.

1.a Identification, Location, and Dates of Test

Sampling and analysis for the emission test program was conducted on August 28-30, 2018 at the ZFS facility located in Zeeland, Michigan. The test program included evaluation of NOx, CO, SO_2, CH_2O, and VOC emissions from two engines. In addition, evaluation of VOC emissions rates from one extraction process unit.

1.b Purpose of Testing

AQD issued Renewable Operating Permit (MI-ROP-M4204-2012b). This permit limits emissions from each Engine and a extraction process unit as summarized by Table 1.

Table 1
ROP (MI-ROP-M4204-2012b) Emission Limits

Source	Pollutant	Emission Limit
(EULF/NGENGINE 1 & 2)	Oxides of Nitrogen (NO_x)	4.56 pph
	Carbon Monoxide (CO)	22.44 pph
	Non-Methane Organic Compounds (NMOC)	4.02 pph
	Formaldehyde (CH_2O)	2.8 pph
	Sulfur Dioxide (SO_2)	2.77 pph
EUEXTRACTION	Non-Methane Organic Compounds (NMOC)	7.12 pph

*Applies to each engine

1.c Source Description

Zeeland Farm Services operates two 2,300 BHP Caterpillar 3520C reciprocating internal combustion engines fueled with treated landfill or natural gas. Each engine has its own exhaust stack along with a shared boiler stack. Valves can be closed to the engine exhaust stacks to run the exhaust through the shared boiler stack to capture any heat from the engine exhaust. It was found that the valve to the Engine #2 exhaust could not be fully closed, flowrates were measured on both the boiler, and engine exhaust then combined.

Gasses from EUEXTRACTION and the desolventizer/toaster portion of the DTDC that could not be condensed in one of several condensers are sent to the Mineral Oil Absorption System (MOS). The MOS removes most solvent from vent gasses before discharging to the atmosphere. Gasses enter the bottom of the absorption column and rise through packing to the top of the tower. Cold mineral oil enters the tower at the top and flows sown through the packing. The mineral oil absorbs hexane from the gas stream. Desolventized gasses exit through a demister at the top and are vented to the atmosphere at SVMAINVENT.

1.d Test Program Contacts

The contact for the source and test report is:

Brandon LaRosa
Environmental Engineer
Zeeland Farm Services, Inc.
2525 84th Ave
Zeeland, Michigan 49464
(616) 879-1715

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

Table 2
Test Personnel

Name and Title	Affiliation	Telephone
Mr. Brandon LaRosa Environmental Engineer	Zeeland Farm Services, Inc 2525 84th Ave Zeeland, MI 49464	(616)879-1715
Mr. Brandon Love EHS Manager	Zeeland Farm Services, Inc 2525 84th Ave Zeeland, MI 49464	(269)425-5992

Mr. Tom Gasloli Environmental Quality Analyst	Michigan DEQ 525 West Allegan St. Lansing, MI 48909	(517)284-6778
Mr. Paul Diven Project Manager	BTEC 4949 Fernlee Royal Oak, MI 48073	(248)756-0159
Mr. Shane Rabideau Field Technician	BTEC 4949 Fernlee Royal Oak, MI 48073	(248)548-7980
Mr. Mike Nummer Field Technician	BTEC 4949 Fernlee Royal Oak, MI 48073	(248)548-7980
Mr. Ben Durham Field Technician	BTEC 4949 Fernlee Royal Oak, MI 48073	(248)548-7980

2. Summary of Results

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

2.a Operating Data

Process data was collected during each test run at 15 minute intervals. This data included engine KW, landfill gas combustion rate (SCFH), and landfill gas heating value (Btu/scf) for both engines. Tons of soybeans processed and the mineral oil flowrate were recorded for the extraction unit. This data is included in Appendix F.

2.b Applicable Permit

The applicable permit for this emissions test program is MI-ROP-M4204-2012b

2.c Results

The overall results of the emission test program are summarized by Table 3 (see Section 5.a).

3. Source Description

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

3.a Process Description

Zeeland Farm Services operates two 2,300 BHP Caterpillar 3520C reciprocating internal combustion engines fueled with treated landfill or natural gas. The extraction unit removes hexane before venting into the atmosphere.

3.b Process Flow Diagram

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

3.c Raw and Finished Materials

The raw material used by the process is landfill gas for the engines and hexane to extract soy bean oil on the extraction unit.

3.d Process Capacity

Both engines are identical Spark ignition, lean burn, reciprocating internal combustion engine (Caterpillar G3520C, 2,300 bhp at 100% load) for combusting treated landfill gas to produce electricity.

3.e Process Instrumentation

Process data was collected during each test run at 15 minute intervals. This data included engine KW, landfill gas combustion rate (SCFH), and landfill gas heating value (Btu/scf) for both engines. Tons of soybeans processed and the mineral oil flowrate were recorded for the extraction unit. This data is included in Appendix F.

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

The following U.S. EPA reference test methods found in 40 CFR, Part 60, Appendix A were used:

- Method 1 - *"Sample and Velocity Traverses for Stationary Sources"*
- Method 2 - *"Determination of Stack Gas Velocity and Volumetric Flowrate"*
- Method 3 - *"Determination of Oxygen and Carbon Dioxide Concentrations in Emissions From Stationary Sources (Fyrite Procedure)"*
- Method 3A - *"Determination of Oxygen and Carbon Dioxide Concentrations in Emissions From Stationary Sources (Instrumental Analyzer Procedure)"*
- Method 4 - *"Determination of Moisture Content in Stack Gases (FTIR)"*

- Method 25A - *"Determination of Total Gaseous Organic concentration using a flame ionization analyzer"*

- Method 25 - *"Determination of Total Non-Methane Organic concentration as Carbon"*

- Method 205 - "Verification of Gas Dilution Systems for Field Instrument Calibrations""

- Method 320 - *"Measurement of Vapor Phase Organic and Inorganic Emissions by Extractive Fourier Transform Infared (FTIR) Spectroscopy"*

Stack gas velocity traverses were conducted in accordance with the procedures outlined in Method 1 and Method 2. S-type pitot tubes with thermocouple assemblies, calibrated in accordance with Method 2 were used to measure exhaust gas velocity pressures (using a manometer) and temperatures during testing. The s-type pitot tube dimensions were within specified limits, therefore, a baseline pitot tube coefficient of 0.84 (dimensionless) was assigned. One stack gas velocity traverse was conducted per test run.

Cyclonic flow checks were performed at the 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.

Molecular weight determinations (Extractor) were evaluated according to USEPA Method 3, "Gas Analysis for the Determination of Dry Molecular Weight." The equipment used for this evaluation consisted of a one-way squeeze bulb with connecting tubing and a set of Fyrite® combustion gas analyzers. Carbon dioxide and oxygen content were analyzed using the Fyrite® procedure.

Exhaust gas moisture content (Extractor) was evaluated using the wet bulb/dry bulb technique.

USEPA Method 3A was used to determine the O_2 concentrations; BTEC used a zero gas along with US EPA protocol 1 calibration gases with 40-60%, and 80-100% of the span value. 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 a Universal Analyzers 3080PV electronic sample conditioner to remove the moisture from the sample before it enters the analyzer. Data was recorded at 4-second intervals on a PC equipped with Labview® II data acquisition software. A schematic drawing of the sampling train is provided as Figure 1

USEPA Method 320 was used to measure NO_x, CO, CO_2, SO_2, Formaldehyde and Moisture concentrations. The exhaust gas was measured using an MKS MultiGas 2030

FTIR spectrometer. A heated, 3 ft., 3/8 inch diameter, stainless steel probe, maintained at 191°C, was used to direct effluent gas to the FTIR. A heated filter box (191°C) will contain the connection from the probe to the filter assembly to a 100 ft., heated, 3/8 inch, Teflon transfer line. A 0.1µ glass filter was used for particulate matter removal. A schematic drawing of the sampling train is provided as Figure 2.

USEPA Method 25AVolatile Organic compound (VOC) concentrations were measured according to 40 CFR 60, Appendix A, Method 25A. A sample of the gas stream was drawn through a stainless steel probe with an in-line glass fiber filter to remove any particulate, and a heated Teflon® sample line to prevent the condensation of any moisture from the sample before it enters the analyzer. Data was recorded at 4-second intervals on a PC equipped with Labview® II data acquisition software. BTEC will use a JUM Model 109A Methane/Non-Methane or a VIG THC hydrocarbon analyzer to determine the VOC concentration.

In accordance with Method 25A, a 3-point (zero, mid, and high) calibration check was performed on the THC analyzer. Calibration drift checks were performed at the completion of each run.

USEPA Method 25 Determination of volatile organic compounds, measured as total gaseous non-methane organics (TGNMO) and reported as carbon, were determined in accordance with USEPA Method 25, "Determination of Total Non-Methane Organic Emissions as Carbon". Integrated triplicate 60-minute samples were taken at the exhaust of the EUEXTRACTION stack with summa canisters and analyzed for TGNMO content by gas chromatography/flame ionization detector at Triangle Environmental Services, INC. Refer to Figure 4 for a schematic of the USEPA Method 25 Sampling Train. The laboratory analytical results are located in Appendix E.

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.

4.b Recovery and Analytical Procedures

No sample recovery required for testing.

4.c Sampling Ports

Figures 1 and 2 show relevant sampling ports and traverse point locations.

4.d Traverse Points

The traverse points are included in the stack drawings as Figures 1 and 2.

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 3. Detailed results for the emissions test program are summarized by Tables 4-7.

Table 3
EULF/NGENGINE 1&2, EUEXTRACTION
Test Date: August 28-30, 2018

Pollutant	Emission Rates EULF/NGENGINE 1 (lb/hr)	Emission Rates EULF/NGENGINE 2 (lb/hr)	Emission Limits (lb/hr)
Oxides of Nitrogen (NOx)	2.35	2.19	4.56 pph
Carbon Monoxide (CO)	10.78	13.38	22.44 pph
Sulfur Dioxide (SO_2)	1.58	1.52	2.77 pph
Formaldehyde (CH_2O)	1.7	2.1	2.8 pph
Non-Methane Organic Compounds (NMOC)	0.61	1.51	4.02 pph
Pollutant	**EUEXTRACTION (lb/hr)**		**Emission Limits (lb/hr)**
Non-Methane Organic Compounds (NMOC)	0.2		7.12 pph

5.b Discussion of Results

The overall results of the emission test program are summarized by Table 3 (see Section 5.a and detailed in tables 4-7.

5.c Process or Control Device Upsets

No upset conditions occurred during testing.

5.d Control Device Maintenance

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

5.e Re-Test

The emissions test program was not a re-test.

5.f Audit Sample Analyses

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

5.g Calibration Sheets

Relevant equipment calibration documents are provided in Appendix B.

5.h Sample Calculations

Sample calculations are provided in Appendix C.

5.i Field Data Sheets

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

5.j Laboratory Data

Laboratory analytical results and FTIR results are provided in Appendix E. Raw CEM data is provided electronically in Appendix D.

Table 4
Landfill Engine 1
NOx, CO, SO2, Formaldehyde, and NMVOC Emission Rates
ZFS
Zeeland, MI
BTEC Project No. 049AS-414762
Sampling Dates: 8/29/2018

Parameter	Run 1	Run 2	Run 3	Average
Test Run Date	8/29/2018	8/29/2018	8/29/2018	
Test Run Time	9:30-10:30	10:55-11:55	12:22-13:22	
Outlet Flowrate (dscfm)	4,361	4,339	4,310	**4,337**
Outlet Flowrate (scfm)	4,956	4,931	4,898	**4,928**
Oxygen Concentration (%)	7.89	7.89	7.97	**7.92**
Oxygen Concentration (%, drift corrected as per USEPA 7E)	7.99	8.15	8.21	**8.11**
Carbon Dioxide Concentration (%)	9.45	9.42	9.44	**9.44**
Outlet Oxides of Nitrogen Concentration (ppmv)	65.87	67.47	67.21	**66.85**
NOx Emission Rate (lb/hr)	**2.33**	**2.38**	**2.35**	**2.35**
Outlet Carbon Monoxide Concentration (ppmv)	500.54	503.26	505.34	**503.05**
CO Emission Rate (lb/hr)	**10.78**	**10.79**	**10.76**	**10.78**
Outlet Sulfur Dioxide Concentration (ppmv)	32.57	32.03	32.21	**32.27**
SO_2 Emission Rate (lb/hr)	**1.60**	**1.57**	**1.57**	**1.58**
Outlet Formaldehyde Concentration (ppmv)	72.73	72.73	73.18	**72.88**
Formaldehyde Emission Rates (lb/hr)	**1.7**	**1.7**	**1.7**	**1.7**
Outlet VOC Concentration (ppmv as propane)	461.92	460.07	389.66	**437.22**
Outlet Methane Concentration (ppmv as methane)	952.36	1,099.75	905.59	**985.90**
Outlet VOC Concentration (ppmv, corrected as per USEPA 7E)	468.31	466.83	394.44	**443.19**
Outlet Methane Concentration (ppmv, corrected as per USEPA 7E)	955.75	1,103.31	904.65	**987.91**
Outlet VOC Concentration (ppmv propane, -Methane)	47.85	-18.08	-4.07	**8.56**
Outlet VOC Concentration (ppmv propane, -Methane, corrected as per USEPA 7E)	52.76	-12.87	1.11	**13.67**
VOC Emission Rate as Propane (lb/hr) (-Methane)*	**1.62**	**0.00**	**0.00**	**0.54**
VOC Emission Rate as Propane(lb/hr) (-Methane) (corrected as per USEPA 7E)*	**1.79**	**0.00**	**0.04**	**0.61**

O_2 Correction			
Co	0.05	0.02	0.05
Cma	10.04	10.04	10.04
Cm	9.91	9.72	9.74

VOC Correction			
Co	1.01	1.91	1.69
Cma	498	498	498
Cm	491.15	490.67	491.52

Methane Correction			
Co	1.62	2.79	2.62
Cma	997	997	997
Cm	993.39	994.05	997.77

**negative VOC concentrations have been replaced with zero for emission rate calculations*

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, formaldehyde = 30.03)
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
Response factor obtained from introducing propane into methane analyzer: **2.3**

Equations
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * ***scfm*** * 60

Table 5
Landfill Engine 2
NOx, CO, SO2, Formaldehyde, and NMVOC Emission Rates
ZFS
Zeeland, MI
BTEC Project No. **049AS-414762**
Sampling Dates: **8/29/2018**

Parameter	Run 1	Run 2	Run 3	Average
Test Run Date	8/29/2018	8/29/2018	8/29/2018	
Test Run Time	14:30-15:30	16:05-17:05	17:35-18:35	
Outlet Flowrate (dscfm)	4,357	4,997	5115.09	**4,823**
Outlet Flowrate (scfm)	4,910	5,639	5,785	**5,445**
Oxygen Concentration (%)	8.71	8.76	8.79	**8.75**
Oxygen Concentration (%, drift corrected as per USEPA 7E)	8.66	8.71	8.74	**8.70**
Carbon Dioxide Concentration (%)	9.09	9.05	9.04	**9.06**
Outlet Oxides of Nitrogen Concentration (ppmv)	54.75	56.51	57.57	**56.28**
NOx Emission Rate (lb/hr)	**1.92**	**2.28**	**2.38**	**2.19**
Outlet Carbon Monoxide Concentration (ppmv)	566.07	563.87	566.59	**565.51**
CO Emission Rate (lb/hr)	**12.08**	**13.82**	**14.25**	**13.38**
Outlet Sulfur Dioxide Concentration (ppmv)	28.56	28.16	27.45	**28.06**
SO_2 Emission Rate (lb/hr)	**1.39**	**1.58**	**1.58**	**1.52**
Outlet Formaldehyde Concentration (ppmv)	85.40	84.33	84.25	**84.66**
Formaldehyde Emission Rates (lb/hr)	**2.0**	**2.2**	**2.3**	**2.1**
Outlet VOC Concentration (ppmv as propane)	754.97	742.17	774.33	**757.16**
Outlet Methane Concentration (ppmv as methane)	1,452.63	1,600.30	1,773.25	**1,608.73**
Outlet VOC Concentration (ppmv, corrected as per USEPA 7E)	746.33	727.75	759.06	**744.38**
Outlet Methane Concentration (ppmv, corrected as per USEPA 7E)	1,472.51	1,617.17	1,787.35	**1,625.68**
Outlet VOC Concentration (ppmv propane, -Methane)	123.39	46.39	3.35	**57.71**
Outlet VOC Concentration (ppmv propane, -Methane, corrected as per USEPA 7E)	106.11	24.63	-18.05	**37.56**
VOC Emission Rate as Propane (lb/hr) (-Methane)	**4.15**	**1.79**	**0.13**	**2.02**
VOC Emission Rate as Propane(lb/hr) (-Methane) (corrected as per USEPA 7E)*	**3.57**	**0.95**	**0.00**	**1.51**

O_2 Correction			
Co	0.02	0.00	0.00
Cma	10.04	10.04	10.04
Cm	10.10	10.10	10.10

VOC Correction			
Co	1.45	2.71	2.43
Cma	897	897	897
Cm	907.10	914.15	914.60

Methane Correction			
Co	-1.92	-3.45	-3.31
Cma	1494	1494	1494
Cm	1473.86	1478.15	1481.67

**negative VOC concentrations have been replaced with zero for emission rate calculations*

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, formaldehyde = 30.03)
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
Response factor obtained from introducing propane into methane analyzer: **2.3**

Equations
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * ***scfm*** * 60

Rev. 2.0
5/8/2012 BC

Table 6
Extractor VOC Emission Rates
Zeeland Farm Services
Zeeland, Michigan
BTEC Project No. 049AS-455136
Sampling Dates: August 28, 2018

Parameter	Run 1	Run 2	Run 3	Average
Test Run Date	8/28/2018	8/28/2018	8/28/2018	
Test Run Time	9:15-10:18 10:57-11:33	11:51-12:51	13:19-14:19	
Outlet Flowrate (dscfm)	41	43	42	**42**
Outlet Flowrate (scfm)	41	44	43	**43**
Outlet VOC (TGNMO) Concentration (ppmv as carbon)	2605.0	2523.0	2929.0	**2685.7**
VOC (TGNMO) Emission Rate as Carbon (lb/hr)	**0.2**	**0.2**	**0.2**	**0.2**

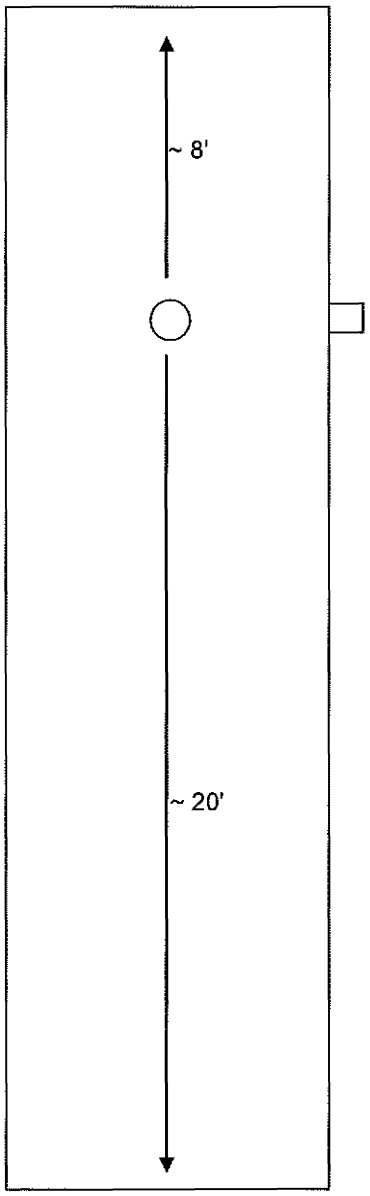
scfm = standard cubic feet per minute
dscfm = dry standard cubic feet per minute
ppmv = parts per million on a volume-to-volume basis
lb/hr = pounds per hour
MW = molecular weight (Carbon = 12.01)
24.14 = molar volume of air at standard conditions (70°F, 29.92" Hg)
35.31 = ft^3 per m^3
453600 = mg per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

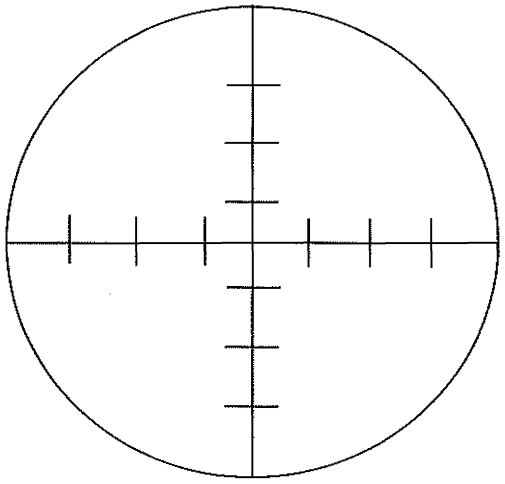
Equations
lb/hr = ppmv * MW/24.14 * 1/35.31 * 1/453,600 * ***scfm*** * 60 *for* VOC

Rev. 2.0
5/8/2012 BC

BTEC Inc.

diameter = 27"





Not to Scale

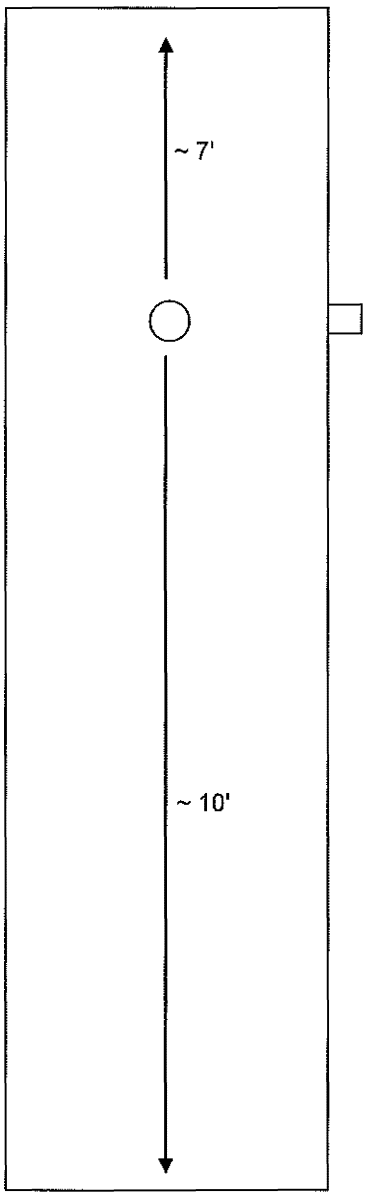
Points	Distance "
1	1.2
2	3.9
3	8.0
4	19.0
5	23.1
6	25.8

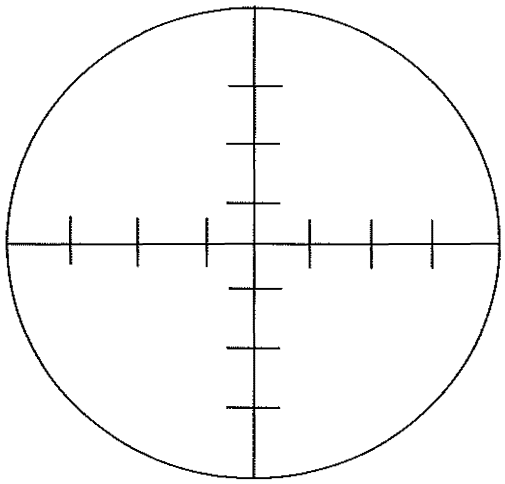
Figure 1

Site: **ZFS** **Zeeland, Michigan** **Combined Boiler Stack**	**Sampling Dates:** **8/29/2018**	**BT Environmental Consulting, Inc.** **4949 Fernlee** **Royal Oak, Michigan**

BTEC Inc.

diameter = 13.5"





Not to Scale

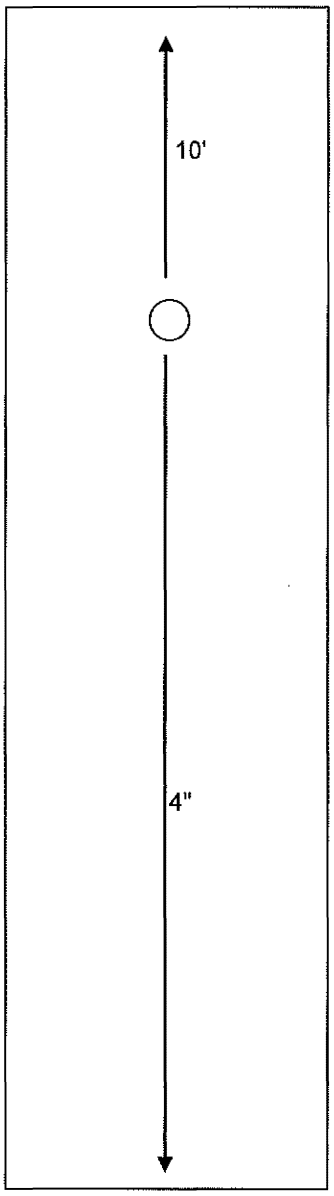
Points	Distance "
1	0.6
2	2.0
3	4.0
4	9.5
5	11.5
6	12.9

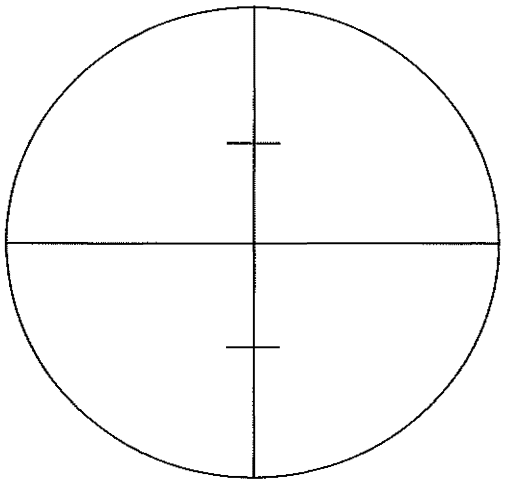
Figure 2

Site: **ZFS** **Zeeland, Michigan** **Engines 1 & 2**	**Sampling Dates:** **August 29-30, 2018**	**BT Environmental Consulting, Inc.** **4949 Fernlee** **Royal Oak, Michigan**

BTEC Inc.

diameter = 3.25"





Not to Scale

Points	Distance "
1	0.6
2	1.6
3	2.6

Figure 3

Site: **ZFS** **Zeeland, Michigan** **Extractor**	**Sampling Dates:** **8/28/2018**	**BT Environmental Consulting, Inc.** **4949 Fernlee** **Royal Oak, Michigan**

BTEC Inc.

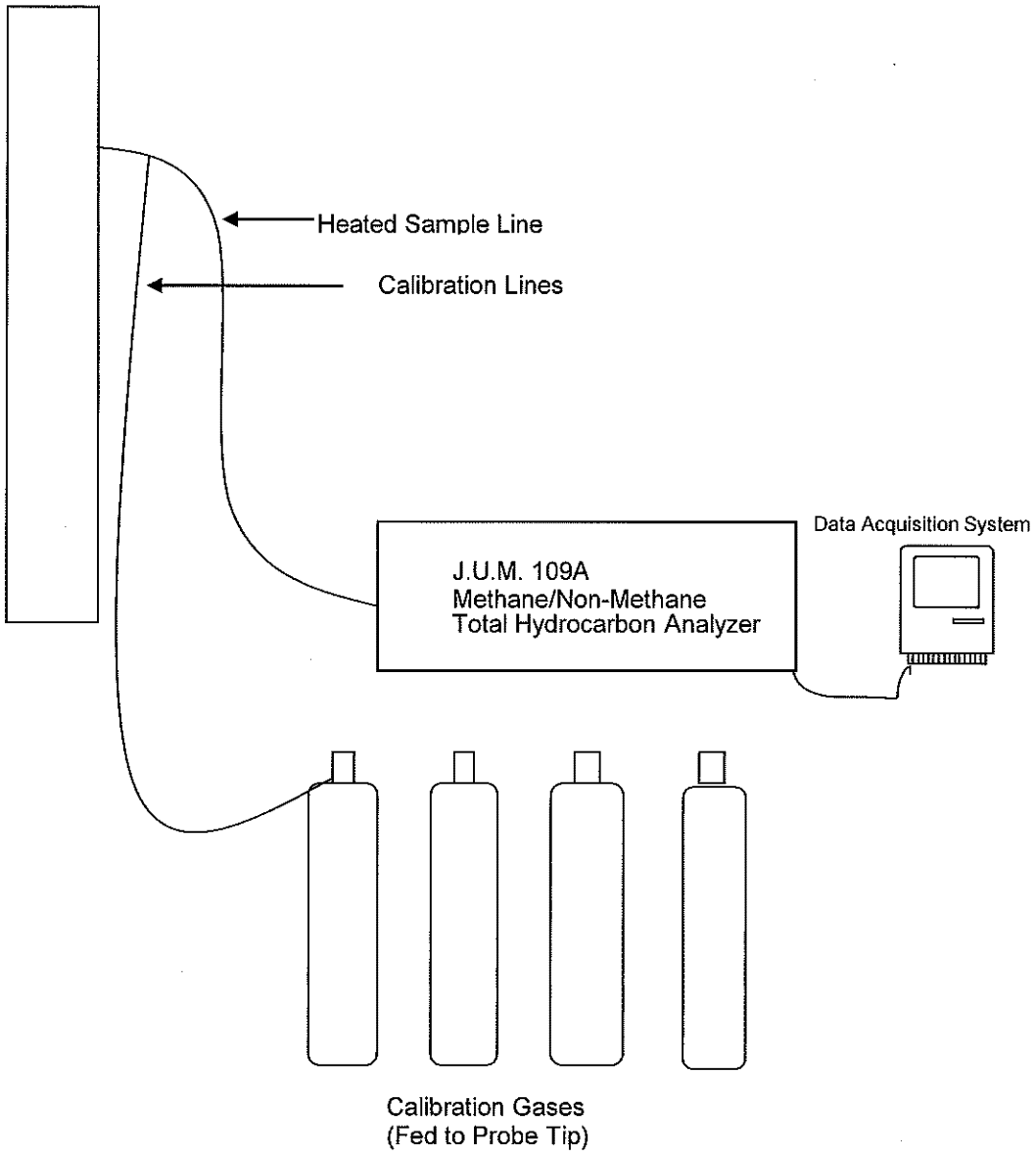


Figure No. 4

Site:	Sampling Date:	
USEPA Method 25A ZFS Zeeland, Michigan	August 29-30, 2018	BT Environmental Consulting, Inc. 4949 Fernlee Avenue Royal Oak, Michigan 48073

BTEC Inc.

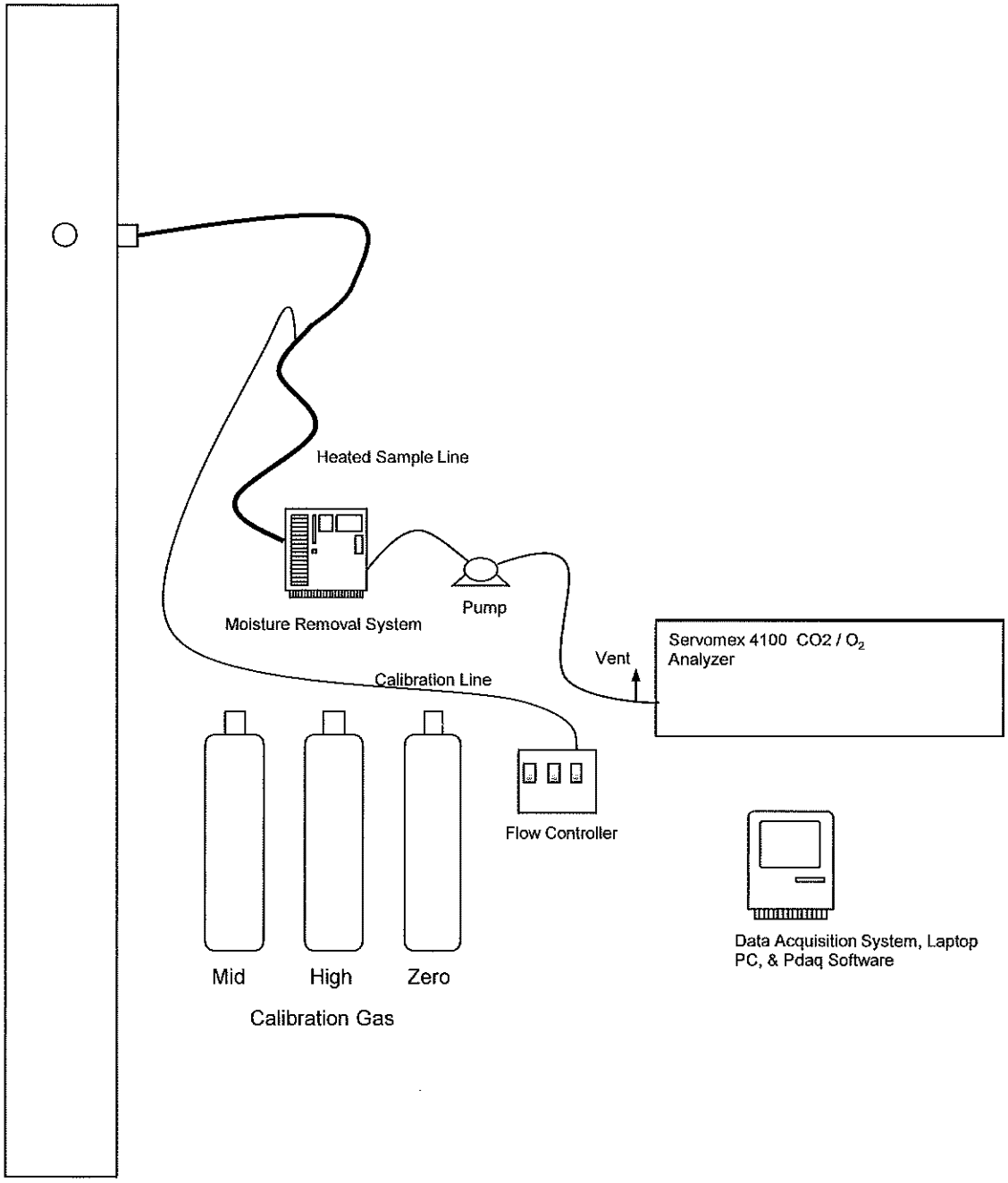


Figure No. 5

Site:	Sampling Date:	
USEPA Method 3A ZFS Zeeland, Michigan	August 29-30, 2018	BT Environmental Consulting Inc. 4949 Fernlee Avenue Royal Oak, MI 48073

BTEC Inc.

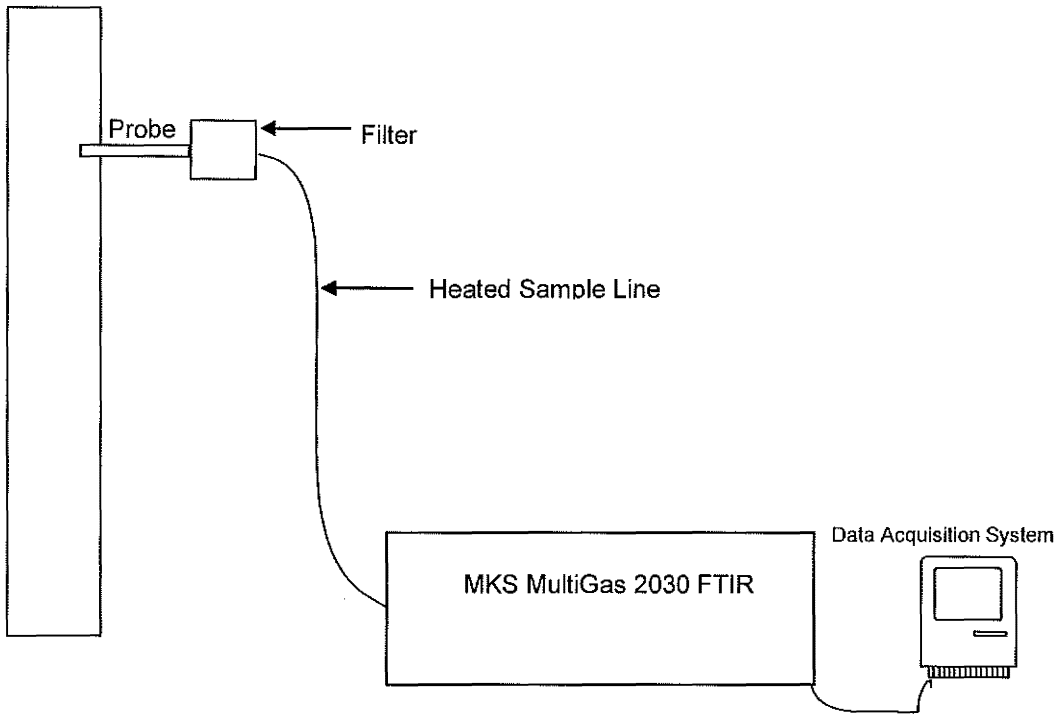


Figure No. 6

Site: **USEPA Method 320** **ZFS** **Zeeland, Michigan**	**Sampling Date:** **August 29-30, 2018**	**BT Environmental Consulting, Inc.** **4949 Fernlee Avenue** **Royal Oak, Michigan 48073**

BTEC Inc.

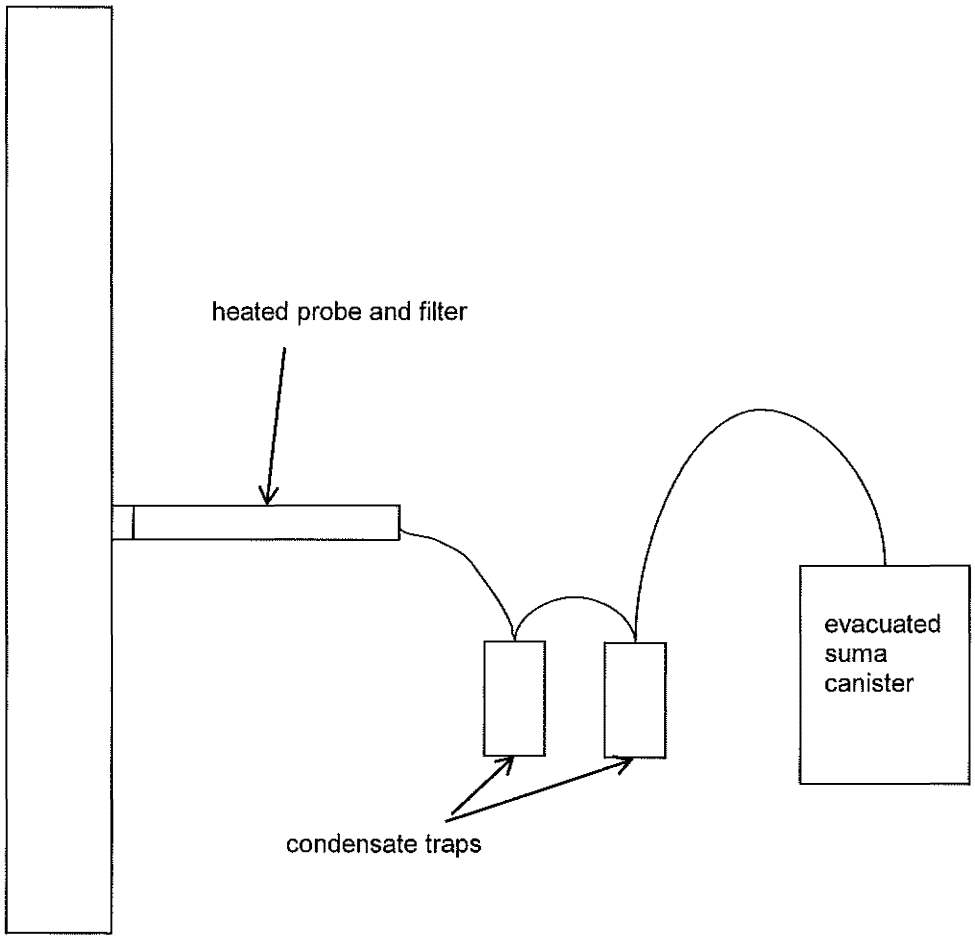


Figure No. 7

Site: **USEPA Method 25** **ZFS** **Zeeland, Michigan**	**Sampling Date:** **August 28, 2018**	**BT Environmental Consulting, Inc.** **4949 Fernlee Avenue** **Royal Oak, Michigan 48073**