Otwell Mawby, P.C.
Consulting Engineers

August 7, 2014

Ms. Gloria Torello
Environmental Quality Analyst
MDEQ Air Quality Division
2100 West M-32
Gaylord, MI 49735-9282

SUBJECT: RESPONSE TO VIOLATION NOTICE – JULY 21, 2014
TRENDWELL ENERGY CORPORATION
SRN: N6150, MONTMORENCY COUNTY, MICHIGAN

Dear Ms. Torello:

On behalf of Trendwell Antrim Inc. (formerly Trendwell Energy Corporation (Trendwell)), Otwell Mawby, P.C. (Otwell Mawby) is pleased to present our response to the Notice of Violation (NOV) issued by the Michigan Department of Environmental Quality (MDEQ) Air Quality Division (AQD) at the SRN: N6150 (Vienna 31) site located in Montmorency County, Michigan.

As explained below, we do not believe the calculation of NOx emissions presented in the July 21, 2014 NOV letter is an accurate quantification of the annual NOx emissions from the stated compressor engine (EUENGINE2); we believe the actual number is significantly less.

Consistent with your approach, we concur that annual NOx emissions can be quantified by multiplying total annual fuel usage by a control efficiency, and then by the emission factor. Your calculation was presented as follows:

41.026 MMCF x 0.782 x 2,197.17 lb / MMCF / 2,000 lbs = **35.2 tons NOx**.

where: 40.026 is the annual fuel usage in MMCF;

0.782 is the control efficiency in percentage NOx emitted (source: Exterran Test 9/12/13);

2,197.17 is the NOx emission factor in lb/MMCF (Manufacturer's value at full operation); and

2,000 is a conversion factor for pounds to tons.

While the concept is correct, we do not believe the calculation is accurate because the control efficiency value (0.792) and the NOx emission factor (2,197.17 MMCF) are obtained from two different operating conditions and should not be used in this manner. The relationship between control efficiency and emission factor values is dependent on engine operating conditions. Your calculation uses a control efficiency value from a field test (Exterran) with the compressor engine was operating at about 365 horsepower; while your emission factor was taken from manufacturer's data with the compressor engine operating at 930 horsepower. As such we believe the 35.2 tons per year (TPY) NOx emission total is significantly overstated.

In their November 12, 2013 Engine Emissions Analysis Report, Exterran calculated a NOx emission of 7.45 TPY. However, their "fuel used" value if extrapolated to an annual basis, equates to a fuel use of 28.3 MM cu-ft/year in comparison to the 41.026 MM cu-ft/year actually used (based on 2013 fuel data). As such, Exterran's emissions need to be adjusted upward by the same ratio 7.45 TPY x (41.026/28.330) = 10.8 TPY. Using the test data, we believe the 10.8 TPY is a more accurate quantification than the 35.2 TPY that your had previously calculated.

Because the 10.8 TPH exceeds the permit limit of 9.3 for NOx; Trendwell responded by conducting the following actions:

- Inspected the catalyst element and found issues with the element seal;
- Installed a new catalyst element;
- Scheduled an Engine Emissions Test operating at a fuel usage rate equivalent to the average annual usage value (this test was conducted 8/6/2014).

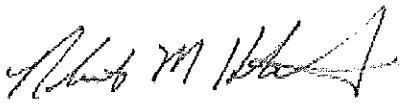
The results of the August 6, 2014 emission test are provided as Attachment A. Operating at a fuel usage rate of 5,044 cu-ft/hr (44.1 MM cu-ft/year) the results show that the new element achieved a NOx removal efficiency of 98.4%; and NOx emissions of 0.35 TPY; well below the permit limit of 9.3 TPY.

With these actions, Trendwell believes that any issue with the Cat 399 T/A engine has been resolved and the emissions are in compliance with the existing permit.

We trust that the information provided herein appropriately addresses the NOV and that the violation is no longer considered in effect. If you have any questions or concerns regarding this or any other matter, please do not hesitate to contact us.

Sincerely,

OTWELL MAWBY, P.C.



Robert M. Koltuniak, P.E.
Principal/Project Manager

Attachment

Cc: Rick Sandtveit (TEC)
Danita Green (TEC)
Brian Keelean (AGS)
Project File (06-252)

ATTACHMENT A

EXTERRAN TEST REPORT 8/6/2014

VIENNA 31

CAT 399 T/A

EXTERRAN

ENGINE EMISSIONS ANALYSIS

Customer:	Trendwell	Engine CID:	3,928
Location:	Vienna 31	Engine RPM:	935
Unit:	952	BMEP Calc:	72
Serial Number:	49C00237	Amb Temp F:	86
Engine Model:	Caterpillar 399 T/A	Date of Test:	08/06/14
		Engine Timing:	26

DATA OBSERVED

ENGINE		CONVERTER	
NOx Observed - PPM	1,188	NOx Observed - PPM	19
CO Observed - PPM	11,300	CO Observed - PPM	286
O2 Observed - %	0.7		
Engine Horsepower	335		
Fuel Used - cu-ft/hr	5,044		
Fuel Analysis - BTU/cu-ft	785		

CALCULATED RESULTS

	g/BHP-Hr	lbs/hr	TPY
ENGINE NOx	6.85	5.06	22.17
ENGINE CO	39.63	29.27	128.22
CONVERTER NOx	0.11	0.08	0.35
CONVERTER CO	1.00	0.74	3.25

NOx CONVERSION	CO CONVERSION
98.4%	97.5%

RATIO: NO / NO2	
98.7% /	1.3%

Calculated results are derived from a series of emissions readings from the identified engine at the conditions listed. Test instrument reads NO and NO2 separately with NOx based on the combined

total and calculated as NO2. Concentrations in PPMv are given at the observed O2 levels with no correction factor made. Engine loading is confirmed using WPI proprietary software and / or driven equipment loading. Test instrument is spanned with known gas concentrations before each series of tests. Printout of the raw data is attached. Test instrument is an electro-chemical cell type. Method of calculation is per EPA Method 19 based on fuel usage and analysis.

Dan Kwapis

Service Technican

			lb/hr	g/BHP-Hr
PRE	NOx Lbs/Hr =	5.06		6.85
PRE	CO Lbs/Hr =	29.27		39.63
POST	NOx Lbs/Hr =	0.08		0.11
POST	CO Lbs/Hr =	0.74		1.00
	BMEP =	72.2		

DATA INPUT AREA	
Customer:	Trendwell
Location:	Vienna 31
Unit:	952
Engine Serial Number:	49C00237
Engine Model:	Caterpillar 399 T/A
Engine CID:	3,928
Engine RPM:	935
Ambient Temp - deg F:	86
Test Date - m/d/yr	08/06/14
Engine NO Observed - PPM:	1,172
Engine NO2 Observed - PPM:	16
Engine CO Observed - PPM:	11,300
Exhaust O2 Observed - %:	0.7
Engine Horsepower:	335
Fuel Flow - cu-ft/hr	5,044
Fuel Analysis - BTU/cu-ft	785
Converter NO Observed - PPM:	19
Converter NO2 Observed - PPM:	0
Converter CO Observed - PPM:	286
Engine Timing:	26

Permit Limits;

NOX 9.3 TPY | CO 19.4 TPY

Catalyst temps;

In;	935
Out;	1027
Diff;	92

Catalyst pressure;

In;	3.3
Out;	0
Diff;	3.3

Exhaust Flow

1728 cfm

02 Target

na

Catalyst Model:

Miratech / EQ-701