

COMMONWEALTH OF VIRGINIA  
Department of Environmental Quality  
Northern Regional Office

STATEMENT OF LEGAL AND FACTUAL BASIS  
Significant Permit Modification

Michigan Cogeneration Systems, Inc.  
Lorton, Fairfax County, Virginia  
Permit No. NRO – 71961  
Effective Date: December 4, 2012  
Expiration Date: December 3, 2017

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As allowed by 40 CFR Part 70 and 9 VAC 5 Chapter 80, Michigan Cogeneration Systems, Inc. has applied for a significant modification to the Title V Operating Permit for its Lorton, Virginia facility. The Department has reviewed the application and has prepared a draft significant modification to the facility's Title V Operating Permit.

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Date: March 21, 2016

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Date: 3/25/2016

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Date: 3-25-16

## **FACILITY INFORMATION**

### Permittee

Michigan Cogeneration Systems, Inc.  
46280 Dylan Drive, Suite 200  
Novi, MI 48377

### Responsible Official

Dennis Plaster  
Vice President of Operations

### Facility

Michigan Cogeneration Systems, Inc.  
9898 Furnace Road  
Lorton, VA 22079

### Contact Person

Dennis Plaster  
Vice President of Operations  
(585) 948-8580

## **SOURCE DESCRIPTION**

NAICS Code: 22119 – Other Electric Power Generation: The facility operates eight internal combustion engines which combust landfill gas, generated by the adjacent closed I-95 Landfill, to produce electricity for sale. Each engine is a Caterpillar model 3516, rated at 8.5 MMBtu/hr heat input and 800 kW of electrical output while firing landfill gas. Natural gas can be used as an auxiliary fuel. The facility operates under a State Air Pollution Control Board's new source review permit dated December 17, 2002, as amended December 4, 2014 (referred to as 12/4/14 Permit). They also were issued a State Operating Permit (SOP), dated May 10, 2000, which implemented Reasonably Available Control Technology (RACT) requirements for volatile organic compounds (VOCs) and nitrogen oxides (NO<sub>x</sub>). The facility is a Title V major source for NO<sub>x</sub> and carbon monoxide (CO) emissions.

The facility operates under a Title V Federal Operating Permit ("Title V Permit") that was issued & effective December 4, 2012. With applications/letters dated May 20, 2013 (as revised June 20, 2013) and November 12, 2014, Michigan Cogeneration Systems, Inc. ("MCS") requested modifications to the facility's Title V Permit. Details of the modification requests are provided below.

## REQUESTED MODIFICATION

As referenced above, MCS is seeking the following modifications to its Title V Permit:

1. Application/Letter dated May 20, 2013 (revised June 20, 2013) – an increase in the permitted throughput of landfill gas consumption from 1208 million cubic feet per year to 1632 million cubic feet per year. This increase was authorized in the facility's minor New Source Review (mNSR) Permit dated December 17, 2002, as amended December 4, 2014) and is provided as Attachment A. As explained in the engineering memo (Attachment B) supporting the December 4, 2014, mNSR Permit amendment, the permitted landfill gas throughput increase does not result in any increases in emissions, but rather takes into account the declining methane content of the landfill gas.
2. Application/Letter dated November 12, 2014 – MCS is requesting changes to the monitoring of volatile organic compounds (VOCs) as required by the current Title V Permit. These current requirements include daily monitoring of engine exhaust temperature and quarterly monitoring of VOCs (via portable analyzer) in the exhaust of each of the engines intended to provide reasonable assurance of compliance with the permitted VOC emission limits.

## BASIS OF MODIFICATION

The first modification request (No. 1 in above section) is to remove conflict between the current permitted facility wide landfill gas throughput as provided in Condition 5 of the facility's mNSR Permit and Condition 7 of the facility's 12/4/12 Title V Permit (revised as Condition 5 in the draft Title V Permit).

The second modification request (No. 2 in above section) is premised on the difficulty (as seen in field) in obtaining valid and otherwise meaningful data to assess compliance with VOC emission limits through current exhaust temperature monitoring and quarterly VOC monitoring with the use of portable analyzers. The engine exhaust temperature is arguably not a good indicator of VOC emissions. In addition, the VOC emissions monitored with a portable analyzer is difficult to measure and calibrate resulting in inaccurate readings and the analyzer itself often malfunctions or fails. Instead, MCS is proposing to monitor engine exhaust for oxygen (O<sub>2</sub>) content and carbon monoxide concentration (using portable analyzer), the combination of such data used as a surrogate for assessing compliance for the engine VOC emission limits.

In their November 12, 2014, submittal, Michigan Cogeneration references an EPA document that mentions use of CO as surrogate for VOC in CEMS. They had also conducted stack tests on their landfill engines on March 18-21, 2013, including VOC and CO emissions. The results indicate some similar behavior of VOC and CO emissions but because of low VOC emissions, it is hard to make a broad conclusion. Also, Federal Register document on NSPS and MACT for internal combustion engines, dated January 18, 2008, includes statements about CO and VOCs as surrogates for HAPs, related to spark ignition (SI) lean burn engines. Taken together, DEQ believes that CO emissions monitoring is a reliable indicator of compliance with VOC emissions,

especially since VOC emissions measured during stack tests have been well below permit limits. Note: such periodic monitoring is a supplement to full/complete stack testing using EPA Reference Methods, required at least once per Title V Permit term (every 5 years) on each engine exhaust.

Accordingly, MCS has requested corresponding changes/deletions in the Title V Permit VOC terms – i.e., Conditions 1, 3, 4, 5, 6, 7, 12, 13, 15, 16, 17e, 17h, 17i, and 19. As the facility recently completed stack testing on all the units on March 18-21, 2013, the draft modified Title V Permit does not include additional stack testing for the remainder of this Title V Permit term (due to expire on December 3, 2017).

Specific changes include replacing quarterly measurement of VOC emissions with quarterly CO emissions using a portable analyzer. CO emissions may be used as a surrogate for VOC emissions since they tend to behave similarly in combustion processes. Plus, CO analyzers tend to provide more dependable results and are less problematic than VOC analyzers, which should provide a more reliable indication of compliance with the permitted VOC emission limits. CO emissions can also be correlated to their previous stack test results since they were measured during the tests. The temperature monitoring used as indicator of VOC compliance is being replaced with O<sub>2</sub> monitoring already being used for NO<sub>x</sub> compliance, as long as the data continue to show correlation with the quarterly CO measurements and later stack test results.

#### **APPLICABILITY OF 9 VAC 5-80-230**

According to 9 VAC 5-80-230, significant modification procedures must be used for those permit modifications that do not qualify as minor permit modifications under 9 VAC 5-80-210 or as administrative amendments under 9 VAC 5-80-200. The modification proposal to the Michigan Cogeneration Systems, Inc. Title V Permit does not meet the specifications for an administrative amendment or a minor permit modification. The Regulations further list criteria, any of which, if met, require use of significant modification procedures. The changes proposed by MCS meet the following criterion, as stated in 9 VAC 5-80-230.A.1:

*Significant modification procedures shall be used for those permit modifications that involve significant changes to existing monitoring, reporting, or recordkeeping requirements in the permit...*

The Michigan Cogeneration Title V permit modification increases the landfill gas throughput limit (without increasing emission limits) and changes the monitoring requirements that indicate VOC emissions compliance. Since the changes proposed by MCS meet at least one criterion listed in 9 VAC 5-80-230 and do not qualify as an administrative amendment or minor permit modification, the changes must be processed as significant permit modification.

## CHANGES TO TITLE V OPERATING PERMIT

The changes made to the Title V permit are described below, and include the requirements from the NSR permit dated December 17, 2002, as amended on December 4, 2014. Also, there are changes to VOC monitoring using O<sub>2</sub> monitoring instead of temperature, and quarterly VOC measurements replaced with CO measurements using a portable analyzer. The condition numbers refer to the draft Title V permit (unless otherwise stated to reference the previous Title V permit issued on December 4, 2012).

**Facility Information:** Physical building address number changed from 9850 to 9898 Furnace Drive, based on certified documentation received from the source dated September 22, 2015.

**Facility Description:** No change.

**Emission Units Identification:** No change.

### Fuel Burning Equipment Requirements -

#### Limitations:

12/4/12 Title V permit Conditions 4 and 5 - Removed, engine exhaust temperature requirements.

Draft Title V permit Condition 5 - Changed (increased) engine consumption limit of landfill gas from  $1.208 \times 10^9$  to  $1.632 \times 10^9$  cubic feet per year (incorporating the requirement in the minor new source review permit dated December 17, 2002, as amended December 4, 2014).

#### Monitoring:

12/4/12 Title V permit Condition 13 - Removed, exhaust temperature monitoring and recording.

Draft Title V permit Condition 12 (Replaced previous Title V permit Condition 15) - Requirement for quarterly measurement of CO with a certified portable analyzer as indicator of compliance with VOC emissions limit.

Draft Title V permit Condition 13 - Modified condition (16 of 12/4/14 Title V permit) to add monitoring of O<sub>2</sub> and CO concentrations and remove VOC monitoring.

#### Recordkeeping:

12/4/12 Title V permit Condition 17.e. - Removed, records on temperature monitoring.

Draft Title V permit Condition 14.e. - Added requirement for records on calibration, operation and maintenance of oxygen monitoring devices to match similar requirement in state mnsr permit of 12/17/02, as amended on 12/4/14.

Draft Title V permit Condition 14.h. - Replace quarterly records on VOC concentrations with CO concentrations, and added records of calibration and certification of the NO<sub>x</sub> and CO portable analyzers to ensure they provide accurate data for permit compliance.

Draft Title V permit Condition 14.i - Replace VOC monitoring with CO monitoring records.

Corrective Action:

Draft Title V permit Condition 16 (Replaced previous Title V permit Condition 19) - Requirements in case of monitoring exceedance of NOx or CO emissions using the portable analyzers during quarterly measurements, and take steps to correct or curtail engine operations and report problem to DEQ and/or conduct further stack testing to demonstrate compliance.

Testing:

Draft Title V permit Condition 17 - Modified previous condition (20 of 12/4/12 Title V permit) to replace requirement for stack test correlation of temperature and VOC emissions with CO and VOC emissions (since CO portable analyzer measurements replaces VOC measurements) and minor wording changes since stack testing was completed in 2013 for the current Title V permit.

**Insignificant Emission Units:** No change.

**Permit Shield & Inapplicable Requirements:** No change.

**General Conditions:** Updated cross references in Conditions 54 and 57, and inserted Conditions 61 - 64 from the current template list of General Conditions.

**PUBLIC PARTICIPATION**

The public participation requirements of 9 VAC 5-80-270 apply to significant permit modifications. A public notice regarding the draft permit was placed in the (Fairfax Station) *Connection Newspaper* on February 4, 2016, for 30-day comment period ending on March 17, 2016. A copy of the public notice and draft permit was sent to EPA RIII as a proposed permit modification (i.e., concurrent review). A copy of the public notice was provided to the appropriate government officials for the affected states (Maryland and Washington, D.C.) for this permit action. All persons on the Title V mailing list were also sent a copy of the public notice. The EPA staff provided a minor comment on February 29, 2016, regarding the wording of permit Condition 16, which was revised in the permit. No other public comments were received.

**ATTACHMENTS**

Attachment A – Minor NSR Permit dated December 17, 2012, as amended December 4, 2014.  
Attachment B – Engineering Memo for amended Minor NSR permit issued December 4, 2014.