

DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION  
ACTIVITY REPORT: Self Initiated Inspection

N178431538

FACILITY: ADA COGENERATION LIMITED PARTNERSHIP		SRN / ID: N1784
LOCATION: 7575 FULTON STREET EAST, ADA		DISTRICT: Grand Rapids
CITY: ADA		COUNTY: KENT
CONTACT: Buck Surratt , Facility Manager		ACTIVITY DATE: 09/29/2015
STAFF: Steve Lachance	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Self-initiated Inspection for FY '015		
RESOLVED COMPLAINTS:		

On September 29, 2015, SL conducted an unannounced, self-initiated inspection of the Ada Cogeneration Limited Partnership facility located at 7575 Fulton Road, NE, Ada, Michigan. The purpose of the inspection (which commenced at about 12:30 PM) was to determine the facility's compliance with Renewable Operating Permit (ROP) No. MI-ROP-N1784-2015, which was issued earlier in the year. The facility was represented by Mr. Buck Surratt, Facility Manager and Mr. Andy Kurcharczyk, Operations and Maintenance Manager. This self-initiated Full Compliance Evaluation incorporates all AQD compliance-related activities with the facility for the past year. Results of these activities are summarized on the attached Full Compliance Evaluation (FCE) Summary form.

### Source Description

This facility, an electricity and steam cogeneration operation, is a separate stationary source located at the Access Business Group, LLC's (f.k.a. Amway Corporation's) manufacturing and administrative headquarters in Ada, Michigan. The cogeneration unit is owned and operated by Ada Cogeneration Limited Partnership. Less than 50% of the cogeneration plant steam is supplied to Access Business Group, LLC for their process, space heating and hot water requirements. All of the electricity produced is purchased by Consumer's Energy Company.

The cogeneration plant consists of a gas turbine-generator prime mover, a heat recovery system generator, a steam turbine-generator and a supplementary firing duct burner. While the equipment was originally permitted for firing fuel oil in addition to natural gas, the turbine and duct burner fire pipeline quality natural gas only. The equipment, as currently constructed, does not have the capability of firing oil.

Emissions of nitrogen oxides are controlled by water injection. Both fuel usage and water injection volumes are monitored, and a minimum water injection: fuel combusted ratio, as set during periodic performance testing, is maintained.

### Regulatory Analysis

The following is a general description and history of the source.

The stationary source is located in Kent County, which is currently designated by the U.S. Environmental Protection Agency (USEPA) as attainment/unclassified for all criteria pollutants.

The stationary source is subject to Title 40 of the Code of Federal Regulations (CFR), Part 70, because the potential to emit exceeds 100 tons of NOx per year.

The stationary source is not considered a major source of Hazardous Air Pollutant (HAP) emissions because the potential to emit of any single HAP regulated by the Clean Air Act, Section 112 is less than 10 tons per year and the potential to emit of all HAPs combined is less than 25 tons per year. As such, the source is not subject to the Stationary Combustion Turbine National Emission Standard for Hazardous Air Pollutants (40 CFR 63, Subpart YYYYY).

At the time of New Source Review permit issuance, the stationary source was subject to Prevention of Significant Deterioration (PSD) (40 CFR 52.21) regulations, because this type of facility was included in the PSD named source category "fossil fuel-fired steam electric plants of more than 250 million Btus per hour of heat input" and the source has the potential to emit greater than 100 tons per year for nitrogen oxides. During the initial Permit to Install application process, the facility underwent Best Available Control Technology (BACT) review of the cogeneration unit, due to the PSD applicability for this source. The facility also underwent Air Quality Impact Analysis for each pollutant emitted in excess of the designated PSD significance levels. The pollutants requiring BACT review were nitrogen oxides, carbon monoxide and sulfur dioxide.

The stationary source is subject to the Standards of Performance for New Stationary Sources (i.e., New Source Performance Standards (NSPS)) for Stationary Gas Turbines promulgated in 40 CFR Part 60 Subparts A and GG. Certain requirements (emission limits for nitrogen oxides and sulfur dioxide, monitoring of sulfur and nitrogen content of fuels, and related fuel testing) have been streamlined, based on other, more stringent applicable requirements (i.e., BACT and use of pipeline quality natural gas). Streamlined requirements are identified in Table EUTURBINE of the ROP. Compliance with streamlined requirements shall be considered compliance for the subsumed requirements. However, any instance of non-compliance with the streamlined requirement shall not be automatically considered to be non-compliance with the subsumed requirements.

All required NSPS initial performance testing has been completed. Testing requirements in the ROP pertain to ongoing and future testing. The required testing for EUTURBINE and EUDUCTBURNER will be completed as part of the same tests, as EUDUCTBURNER does not operate independently of EUTURBINE. Compliance will be assessed based on comparison of the results with the emissions limits in EUTURBINE and FGENERGY, and continued recordkeeping of EUDUCTBURNER operations.

As discussed above, while the source equipment was originally permitted for the firing of oil in addition to natural gas, it cannot do so as currently constructed. Use of oil as a source fuel would require New Source Review. Conditions from the original Permit to Install pertaining exclusively to the use of fuel oil have not been carried forward in the current ROP.

The monitoring conditions contained in the ROP are necessary to demonstrate compliance with all applicable requirements and are consistent with the DEQ's "Procedure for Evaluating Periodic Monitoring Submittals."

The stationary source is not subject to the federal Compliance Assurance Monitoring (CAM) rule (40 CFR 64) because the emission limitations or standards for EUTURBINE

meet the CAM exemption of a continuous compliance determination method. The continuous monitoring of water injection: fuel combustion was included in, and practically enforceable through, the facility's original ROP, effective March 1, 1999. Thus, EUTURBINE is exempt from further CAM requirements per 40 CFR 64.2(b) (1)(vi).

The facility is not subject to Acid Rain (Title IV) regulations or Michigan Air Pollution Control Rules, Part 8 (Emission Limitations and Prohibitions – Oxides of Nitrogen), since the nameplate capacity of the electrical generator is less than 25 megawatts.

## COMPLIANCE EVALUATION

The field portion of the evaluation was completed on September 29, 2015. Weather conditions were humid, overcast, about 57-60 degrees F with northerly winds and sporadic rainfall. No visible emissions (other than condensed water vapor) were noted from the stack during this evaluation. SL arrived on-site at approximately 12:30 PM.

The inspection began with an introductory meeting with Mr. Surratt (Facility Manager) and Mr. Kurcharczyk (O&M Manager.) SL conveyed his intention to conduct a compliance inspection relative to air quality requirements, provided a copy of DEQ's "Environmental Inspections: Rights and Responsibilities" brochure, and requested certain records (see below.)

Historically, most reported deviations from requirements pertain to start-up conditions, where water is not injected (per manufacturer's recommendation) until a specific phase of turbine operation, where-as NSPS, Subpart GG defines as "excess emissions" any period of operation where the water: fuel ratio does not meet a test-defined level. The facility also reports as deviations that portion of the startup period from the beginning of water injection until turbine operations stabilize at tested operating conditions. Each of these conditions is an unavoidable consequence of a turbine start. See A-GR-9828 for a more detailed discussion of how these inevitable periods of defined "excess emissions" occur, are reported, and are evaluated. Critical to these evaluations are the principles of minimizing these periods' rate of occurrence and duration, as well as following established written protocols for turbine operations during these interim periods.

The facility has currently operated continuously since returning to service from the last outage last spring; another outage is scheduled for mid-October. Mr. Surratt also explained that the duration of startups without "NOx-injection" water have been greatly reduced through newer control systems, GE protocols, etc. These developments have reduced both frequency and duration of these "excess emissions" events.

2012 Stack Testing established the following water: fuel injection rates. Compliance with these injection rates (i.e., meeting or exceeding these water:fuel injection rates) is required to be documented on an hourly basis:

Operational Scenario:	NOx (ppm)	Water:Fuel Ratio
Full, w/ Duct Burner	<42	0.80
Full, w/o Duct Burner		0.82
Low, w/o Duct Burner		0.65
Low, w/ Duct Burner		0.60

These injection ratios must be maintained on an hourly basis in order to support compliance; and operators have targeted injection rates (per hour) slightly higher than these levels to assure compliance. See the attached "Ada Cogeneration NOx Hourly Logs" for September 28 and 29 (partial), 2015 as Attachment A. Note, audible alarms in the Control Room also aid in the maintenance of required hourly injection rates.

MI-ROP-N1784-2015 requires additional testing and re-establishment/verification of water:gas injection rates within two years of permit issuance. Mr. Surratt explained that testing has been budgeted for FY'016, and he expects that such testing will take place in Spring of 2016.

SL requested and received the following records and process information; each of these supports compliant operation of the facility with respect to MI-ROP-N1784-2015.

- Daily/Hourly Load and NOx Water Gas Ratio for September 28, 2015 (B)
- MONTHLY and 12-MONTH ROLLING PERIOD Emissions SUMMARIES through August, 2015 (C)

SL spot-verified ratio calculations on the hand-written log and no problems were noted. The operator's target water: fuel injection rate (as noted on the lower left-hand portion of the hourly log template) is in excess of the required (stack-test derived) rate.

Logged values for the hour of the inspection are consistent with SL's Control Room observations. Furthermore, SL recorded current gas and water-meter values and calculated the current injection ratio; and this was consistent with those recorded at this production rate earlier in the day. See Attachment A.

This raw data is condensed into a daily summary (Attachment B; where values are properly transferred from the Control Room Operators through management for additional assessment.) Operating data is compiled on monthly and 12-month rolling periods (Attachment C). These latter reports incorporate the emission factors derived from the last stack test (SL confirmed this; and also verified that these same emission factors were used for MAERS reporting.) SL verified various cell contents and calculations.

Mr. Surratt also provided access to his electronic summaries, in which daily operations data are compiled into monthly emissions estimates using stack test emission factors; SL confirmed that these are in accordance with the requirements of Appendix 3 of the ROP.

SL compared these to reported values in MAERS (for the period ending at the end of December 2014), and found them to be consistent. Attachment D has a couple of MAERS-generated and MAERS-attached items, including Total Source Emissions Reported (correct basis for reporting and consistent with on-site records) and listing of current (and correct) emission factors used in MAERS and recordkeeping.

#### **EUTURBINE EMISSION UNIT CONDITIONS**

EMISSION LIMITS; stack testing (historic and current) have demonstrated compliance with the NOx and CO limits.

MATERIAL LIMITS; Mr. Surratt confirmed that only pipeline quality natural gas is used.

PROCESS/OPERATIONAL RESTRICTIONS; the turbine's water injection is operated in accordance with written operational standards and at rates indicating compliance per stack tests.

TESTING/SAMPLING; initial required testing per ROP and NSPS, Subpart GG has been completed. Testing was most recently completed in 2012, and the next test is required by ROP to be completed by March 18, 2017; this is budgeted for and will likely occur in Spring 2016.

MONITORING/RECORDKEEPING; the records requested, reviewed, and previously discussed fulfill these requirements. Specifically, water and fuel usage rates and ratios are continuously recorded and logged on an hourly basis; target injection rates are established per stack test results; and daily records are compiled for use in monthly and 12-month period records.

REPORTING; the facility fulfills these requirements. See the attached FCE Summary cover sheet.

STACK/VENT RESTRICTIONS; the stack appears to comply with these requirements.

OTHER REQUIREMENTS; the facility complies with NSPS, Subpart GG through historic testing, water injection, monitoring, recordkeeping, and reporting.

#### **EUDUCTBURNER EMISSION UNIT CONDITIONS**

The duct burner does not operate by itself; compliance with these terms is through compliance with the conditions for FGENERGY (which includes both the turbine and the duct burner.)

The possibility of this unit being subject to the "Boiler MACT" (40 CFR 63, Subpart JJJJJJ) has been previously discussed. As an existing source at a minor source of HAPs, able to burn only natural gas, there are no emission limits from this rule. Moreover, the boiler appears to be specifically exempted from this rule as a waste heat recovery boiler.

No other Boiler MACT-subject equipment is known to be on-site.

## **FGENERGY FLEXIBLE GROUP CONDITIONS**

**EMISSION LIMITS**; compliance has been established per results of previous stack tests in combination with ongoing monitoring of operations per Appendix 3. See the water:fuel ratios established through testing, referenced above.

**TESTING/SAMPLING**; required testing has been completed; on-going periodic testing will re-establish water injection rates. The next test is required by ROP to be completed by March 18, 2017 and is reportedly budgeted for 2016.

**MONITORING/RECORDKEEPING**; heat input, load, and operating hours are logged on an hourly basis, and records per Appendix 3 are maintained. (See discussions above.)

**REPORTING**; is completed in a timely manner. See above.

**STACK/VENT RESTRICTIONS**; the existing stack appears to meet these requirements.

SL observed current operating conditions at about 13:15 on September 29, 2015;

“High Load” + Duct Burner; 29.3 MW electricity and steam production

Instantaneous water: fuel injection rate = 0.87

Hourly water: fuel injection rate = 0.870

Required water: fuel injection rate = 0.85

Per notes on Attachment A, these are consistent with current records and SL’s observations of meters and calculated water:fuel injection rates.

**FGOLDCLEANERS FLEXIBLE GROUP CONDITIONS**; Operating instructions and the “DEQ Highlight Sticker” are posted. No changes in the use or operation of this unit. The unit uses Safety Kleen Premium Gold (mineral spirit) solvent; Mr. Kurcharczyk had previously provided a current MSDS for AQD review.

**FGRULE290 FLEXIBLE GROUP CONDITIONS**; Mr. Surratt reports that no such units are in service on-site.

## **EVALUATION SUMMARY**

SL considers the facility to be in compliance with applicable air regulations at the time of the completion of this evaluation. Before leaving the site, SL reviewed Attachment E, FTC&H’s Compliance Summary for this ROP with facility personnel. Each listed element seems to be appropriate and implementation of each was demonstrated during this inspection. Moreover, the facility personnel are knowledgeable about these requirements and demonstrations. Overall compliance is based on successful and timely stack testing, demonstrating compliance with applicable emission limits while establishing required water: fuel injection rates; and subsequent documented maintenance of the required water:fuel injection rates. Moreover, the facility has minimized startup/shutdown conditions, during which most deviations/reportable “excess emissions” have historically been generated.

**ATTACHMENTS:**

- A Ada Cogeneration NOx Hourly Logs – September 28 and 29 (partial), 2015**
- B September 27 and 28 Hourly Water:Fuel Ratio Confirmation**
- C Monthly and 12-Month Rolling Emissions Summary (Current)**
- D MAERS Total Source Emissions for 2104 and Emission Factors Utilized**
- E FTC&H Compliance Summary for MI-ROP-N1784-2015**

NAME  DATE 9/30/15 SUPERVISOR 

