

DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION  
ACTIVITY REPORT: Scheduled Inspection

B722025553

FACILITY: ANR Pipeline Co - Woolfolk Compressor Station		SRN / ID: B7220
LOCATION: 11039 150th Ave., BIG RAPIDS		DISTRICT: Grand Rapids
CITY: BIG RAPIDS		COUNTY: MECOSTA
CONTACT: Brad Stermer, Sr. Environmental Specialist		ACTIVITY DATE: 07/03/2014
STAFF: Steve Lachance	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Unannounced, Scheduled Inspection/ FCE for FY '014		
RESOLVED COMPLAINTS:		

### Source Description

The ANR Pipeline Company owns and operates several facilities in Michigan including facilities used in both natural gas transmission and storage. The Woolfolk Compressor Station is located near Big Rapids in Austin Township, Mecosta County, in a remote rural area. The complete facility consists of the Compressor Station and associated underground gas reservoirs. The reservoirs are natural porous rock formations.

**The function of a compressor station is to maintain pressure in pipelines transporting sweet natural gas into storage wells for temporary storage and also for transporting the natural gas through main pipelines to storage facilities located in Michigan or to local distribution facilities. The Woolfolk Compressor Station consists of a gas-liquid separator, seventeen reciprocating internal combustion engines, a sorbead dehydrator and auxiliary equipment. The sorbead dehydrator was installed in the 1940's. From 1949 through 1980, the reciprocating compressor engines and related equipment were installed at this facility. The Woolfolk Compressor Station's seventeen reciprocating internal combustion engines are fired on natural gas.**

During withdrawal, natural gas flows from the underground reservoirs into a pipeline, slowly reducing the field pressure. If the underground pressure is not enough for the gas to automatically move into the pipeline, one or all of the seventeen internal combustion engines are used to compress natural gas. Depending on several factors, the compressor engines may operate simultaneously, independently, or not at all.

The facility operates different types of internal combustion engines. There are six two stroke engines and eleven four-stroke engines. The engines are further characterized as rich burn or lean burn. Rich-burn engines operate near the stoichiometric air-to-fuel ratio (16:1) with exhaust excess oxygen levels less than 4 percent. Lean-burn engines may operate up to the lean flame extinction limit, with exhaust oxygen levels of 12 percent or greater. The air to fuel ratios of lean-burn engines range from 20:1 to 50:1 and are typically higher than 24:1.

### Regulatory Analysis

The stationary source is located in Mecosta 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 nitrogen oxides and VOCs exceeds 100 tons per year.

The potential to emit of any single HAP regulated by the federal Clean Air Act, Section 112, is equal to or more than 10 tons per year and the potential to emit of all HAPs combined is more than 25 tons per year.

**The potential to emit of Greenhouse Gases is 100,000 tons per year or more calculated as carbon dioxide equivalents (CO<sub>2</sub>e) and 100 tons per year or more on a mass basis.**

**All of the processes at the facility, except the Cooper-Bessemer Compressor Engine Model 12Q145H (EGWL017), were constructed/installed prior to the promulgation of the Prevention of Significant Deterioration (PSD) (40 CFR 52.21) requirements. As a result, no review under PSD was done prior to the construction of these processes. Compressor Engine Model 12Q145H, installed in 1980, is subject to PSD (40 CFR 52.21) regulations thereby making the Woolfolk site a PSD major source of criteria air pollutants. Future modifications to the process equipment at the facility may be subject to the PSD requirements.**

**The sorbead dehydrator equipment and all the reciprocating compressor engines, except Compressor Engine Model 12Q145H, are exempt from requirements of New Source Review Permits (NSR) because they were installed prior to August 15, 1967. As a result, this equipment is considered "grandfathered" and is not subject to New Source Review (NSR) permitting requirements. Although, Compressor Engine Model 16Z330, was installed in 1973, this equipment was exempt under an existing permit exemption rule at the time it was installed. However, future modifications of this equipment may be subject to NSR.**

At this time, there are no GHG applicable requirements to include in the ROP. The mandatory Greenhouse Gas Reporting Rule under 40 CFR 98 is not an ROP applicable requirement and is not included in the ROP.

Engines listed as EUWL001, EUWL002, EUWL003, EUWL004, EUWL005, EUWL006, EUWL007, EUWL008, EUWL009 at the stationary source are subject to Rule 336.1818 because based on the size they are Large NO<sub>x</sub> SIP call engines. A Large NO<sub>x</sub> SIP call engine is an engine that emits more than 1 ton of oxides of nitrogen per average ozone control period day in 1995.

**EUWL001, EUWL002, EUWL003, EUWL004, EUWL005, EUWL006, EUWL007, EUWL008, EUWL009 at the stationary source are subject to the Maximum Achievable Control Technology Standards for Reciprocating Internal Combustion Engines (RICE) promulgated in 40 CFR Part 63, Subparts A and ZZZZ. EUWL010, EUWL011, EUWL012, EUWL013, EUWL014, EUWL015, EUWL016, EUWL017 are not subject to the RICE MACT because they are lean burn engines which are exempt from the standard.**

**The facility does not have any engines at the stationary source subject to the New Source Performance Standards for stationary compression ignition or spark ignition internal combustion engines (ICE) promulgated in 40 CFR Part 60, Subparts A, IIII and**

JJJJ because all of the engines were installed prior to July 11, 2005 and have not been modified.

No emission units are subject to the federal Compliance Assurance Monitoring rule under 40 CFR Part 64, because all emission units at the stationary source either do not have a control device; or control device operational requirements are covered by "new" rules such as the RICE MACT.

In order to make testing, recordkeeping, and determination of compliance more practical, the condition "The Nitrogen Oxides emission rate from the compressor engine shall not exceed 9.7 grams per horsepower hour at 100% torque and 100% speed" for EUWL017 has been supplemented by a condition limiting Nitrogen Oxides emissions to 85.7 pounds per hour per engine. The condition is equivalent to the old one at 100% torque and speed, and is more stringent because it applies at any speed or torque.

The facility has 5 natural gas-fired boilers which are subject to the Major Source Boiler MACT (40 CFR 63, Subpart DDDDD). Timely notifications have been submitted/received; compliance date for this rule is 2016.

### On-Site Visit

This was an unannounced inspection. SL arrived on-site at about 9:15 AM on 6/17/14. Weather conditions were rainy, about 70 F, with mild southerly winds. No undue odors or visible emissions were observed prior to arrival, or while on-site. SL met with site Environmental Representative Brad Stermer and announced his intention to make compliance determinations based on this visit, and shared the DEQ "Rights and Responsibilities" brochure.

SL stated that his most pressing current concern was RICE MACT compliance; since from the last inspection report (June, 2013), full compliance for all affected units was still being established:

#### "Post Test Correspondence (from the previous inspection report)"

*While on-site observations of MACT testing appear to have indicated compliance, the company has reported that the preliminary results on other engine(s) indicate possible destruction efficiency < 76%; instead of continuing with complete tests per protocol, the facility chose to simply shut these engine(s) down and maintain/replace the catalyst as necessary before completing compliance tests within the required time frame for the RICE MACT. At this time, SL cannot conclude "non-compliance" based on this correspondence, but rather defers to the timely submittal and review of required testing reports and ROP deviation reports. The company has been reminded that all test data must be included in the test reports, and SL specifically discussed (with MHoldsworth) the potential generation of deviations from the MACT by operating an engine after May 3, 2013 but then not demonstrating full compliance with MACT requirements. Note, too, that review of MI-ROP-B7220-2012a indicates an alternative formaldehyde limit based on concentration; and without complete, finalized test reporting it is premature to determine whether the source has met the reduction requirement or the concentration limit.*

*SL has further reviewed available "Startup, Shutdown, Malfunction Plans" for MACT-Subject Engines 2001 through 2009 (dated June 15, 2007); and the September 22, 2009 site-specific Catalyst Storage and Replacement procedures. Combined, these indicate that if proper catalytic reduction is not being*

*achieved, the affected engine will be shut down; and the catalyst will be inspected, cleaned, repaired or replaced as necessary. This appears to be taking place; subsequent reporting is due in the form of completed test reports; semi-annual deviation reporting; and semi-annual periodic SSM reports."*

Part 8 NOx compliance testing was currently taking place, and SL met with company tester Mr. James Winger. Engine 2001 was being tested at this time; and each of the observed runs indicated (uncorrected) NOx emissions well below the Part 8 limit at full load. The testing appeared to be proceeding smoothly and was well-coordinated with the Control Room/Operator(s). Testing was scheduled to continue through the week. All site operations were in this "section" of the facility on this date; engines outside this complex were not operating.

Mr. Stermer escorted SL through the entire facility as SL familiarized himself with on-site equipment and permitting requirements. Highlights of this review included:

- Engine No. 2001 at the time of testing was operating at about 93% max\_torque, 8.97 mcfh natural gas usage, and emitting less than half of the allowed engine limit for NOx. (About 7.5 pphc, compared to 20.5 pphc, allowed.)
- **Each run was one-half hour duration; each test was three runs.**
- SL obtained Control Panel shots for the first (completed) test run for comparison to final reporting, and each indicated similar operating conditions for this engine. See **ATTACHMENTS A**.
- SL reviewed the required RICE MACT records. These are compiled daily by the Control Room and reviewed by Mr. London. They are similarly compiled monthly and reviewed by Mr. Stermer. These were readily available and appeared to be complete and thorough; the important MACT parameters are pre-catalyst temperature and differential pressure across the catalyst. **ATTACHMENTS B** are random example days of records from the first half of 2014. These document, for each engine, catalyst inlet temperature (between 750 and 1250 F) and operating differential pressure (minimum required delta P established at test.) Accompanied with successful performance testing (completed in 2013 for each engine), these establish ongoing compliant operations for each engine. These records go through multiple sets of eyes (Operator/Mr. London/Mr. Stermer) before being reported in semi-annual MACT and ROP reports. SL believes that consistent on-going compliance for each affected engine has been established.
- SL requested similar MACT records for the day of testing for each engine. These were provided by Mr. Stermer the week following on-site activities and indicate MACT compliance during the Part 8 testing observed. Part 8 compliance status will be established with submittal of final test reports. See **ATTACHMENTS C**.
- **ATTACHMENTS D** record station operating hours and fuel use per engine, as required by permit and MACT; and as used in MAERS reporting.

**ROP/ROP Report Reviews**

As part of the June 17, 2014 visit, SL reviewed with Mr. Stermer the requirements of ROP MI-ROP-B7220-2012a and the required ROP Reports (Annual, Semi-Annual and MACT) for the period ending December 31, 2013. These had been previously submitted (timely and properly certified) to AQD and reviewed. No issues were identified in the MACT Report for the second half of 2013, which uses requirements in the rule as an outline for the report. The sole deviation reported from the ROP for the second half of 2013 is for a single partial block period where catalyst temperature was low; but this is based on abnormal operating conditions and partial block period of operation. In the main, these reports for the second half of 2013 establish the compliant operations of the affected engines relative to the RICE MACT. While two engines did not initially meet the compliance performance requirement of 76% HCOH reduction at the end of the first half of 2013, these engines were shut down; re-fitted with new catalyst; re-tested; and operated in compliance since.

**CONCLUSION:**

Based on each Partial Compliance Evaluation, these observations and the data collected during on-site activities, SL concludes that the facility is currently in compliance; and has responded to early 2013 RICE MACT deviations for 2 engines in an appropriate and expeditious manner.

**Attachments:**

A Unit 2001 Run 1 Screen Shots, 6/17/14

B Representative RICE MACT 24-hour Logs

C RICE MACT 24-hour Logs for Engine Testing Periods

D 2014 Monthly Records (Fuel and Hours)

NAME 

DATE 7/3/14

SUPERVISOR 

