

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

N818229423

FACILITY: LINN Operating INC - Star D3-35(Lakes of the Nrth)		SRN / ID: N8182
LOCATION: NW 1/4 SW 1/4 SE 1/4 SEC 35, STAR TWP		DISTRICT: Cadillac
CITY: STAR TWP		COUNTY: ANTRIM
CONTACT: Diane Lundin , Senior EHS Representative		ACTIVITY DATE: 04/21/2015
STAFF: Caryn Owens	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: Scheduled Field Inspection & Records Review		
RESOLVED COMPLAINTS:		

On Tuesday, April 21, 2015, Caryn Owens of the DEQ-AQD conducted a scheduled on-site inspection of Linn Energy (Linn) – Lakes of the North CPF (also known as Star D3-35)(N8182) located in the northwest quarter of the southwest quarter, of the southeast quarter of Section 35, Township 30 North, Range 5 West in Star Township, Antrim County, Michigan. More specifically, the site is located in the Lakes of the North neighborhood area, just south of Pencil Lake Road along the power lines. The access to the site is located approximately 1/10 mile west of the Snowridge Trail and Pencil Lake Road intersection, then follow the power lines approximately 1/2 mile southwest, and the site will be east of the power lines. The purpose of this inspection was to determine the facility's compliance with permit to install (PTI) 345-08A. Linn has opted out of major source applicability by limiting operational and/or production limits potential to emit (PTE) to be below major source thresholds. DEQ was unaccompanied during the field inspection, an inspection brochure was not given to anyone at this facility, but a brochure will be emailed to the company with this inspection report. The site is an area source for National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 CFR Part 63 Subpart HH, and NESHAP 40 CFR Part 63 Subpart ZZZZ. The State of Michigan does not have delegated authority of the area source NESHAPs, and thus these areas were not reviewed by the DEQ at this time.

During the field inspection, the weather conditions were mostly cloudy, with winds from the west, approximately 10 miles per hour, and 40 °F. The site consisted of one main compressor building, a small utility building on the northwest side of the site, an iron sponge northwest of the compressor building, and a 400 barrel (bbl) tank and a 300 bbl tank which were located southwest of the compressor building. Inside the main compressor building, the equipment consisted of: two compressors; seperator equipment; and a glycol dehydrator system. The glycol dehydrator was in southwestern portion of the compressor building, and was used to dry the field gas prior to transporting it to the sales line. DEQ observed a heat shimmer from the glycol dehydrator process heater, and a slight steam plume from the glycol dehydrator stack outside of the building.

The northernmost engine was a 930 horsepower (hp) Caterpillar 399 TA rich burn engine, identified on the logs at the facility as Unit# 806 #1, and identified on the maintenance and calibration reports as Unit CM-3042, and identified below as EUENGINE1. The engine was operating at 1058 RPM, 185°F, and 60 psi, and had a catalyst for control. The inlet temperature of the catalyst was 901 °F and the outlet temperature was 897 °F. The stack on the compressor engine was at least 39 feet above ground surface, no visible emissions were observed from the northern compressor engine stack.

The southernmost engine was a 1085 hp Caterpillar 3516LE lean burn engine, identified on the logs at the facility as Unit Comp #2, CM-3008, and identified below as EUENGINE2. The engine was operating at 1122 RPM, 190°F, and 60 psi, and appeared to have a catalyst for control. DEQ could not find the readout for the catalyst temperatures for the southern engine. The stack on the compressor engine was at least 39 feet above ground surface, no visible emissions were observed from the southern compressor engine stack.

Records Reviewed

EUDEHY: Glycol dehydration system processes gas from the Antrim zone. The applicable requirements of this emission unit are regulated by the NESHAP 40 CFR Part 63 Subpart HH, and the DEQ does not have delegation for the NESHAP, so these areas were not addressed during this facility inspection and records review. Linn is claiming the Lakes of the North facility glycol dehydrator meets exemption R336.1288(b)(ii).

FGENGINES: One Caterpillar 399 TA rich burn one Caterpillar 3516LE natural gas fired reciprocating internal combustion engines, one at 930 hp and the other at 1085 hp.

- Emission Limits:** EUENGINE1 is limited 10 tons of NOx per 12-month rolling time period and 20 tons of CO per 12-month rolling time period. Based on the records reviewed from February 2014 through February 2014, the highest controlled emissions for EUENGINE1 were 4.70 tons of NOx per 12-month rolling time period 9.77 tons of CO per 12-month rolling time period. EUENGINE2 is limited to 23.11 tons of NOx per 12-month rolling time period and 20.8 tons of CO per 12-month rolling time period. Based on the records the highest uncontrolled emissions for NOx were 9.3 tons per 12-month rolling time period, and the highest uncontrolled emissions for CO were 8.37 tons per 12-month rolling time period. Based on the records reviewed, EUENGINE1 and EUENGINE2 are within the permitted emission limits.
 - Materials/Fuels:** No material limits were applicable for FGENGINES.
 - Process/Operational Parameters:** The facility submitted a Malfunction Abatement Plan (MAP) on July 23, 2012. Based on review of the MAP and maintenance records, the engines were inspected daily, and EUENGINE1 is controlled by a catalytic converter. The inlet temperature is higher than the outlet temperature and this appears to be normal operation based on the calibration reports, submitted by Linn, which indicate proper destruction efficiencies while the temperatures are inverted, as well as indications in maintenance records and MAP showing the inverted temperatures are typical operating conditions for this engine. EUENGINE2 appeared to have a catalyst based on the maintenance records, which have inlet and outlet temperatures reported. However, DEQ could not find where the readout for EUENGINE2 catalyst at the time of the field inspection. According to a Linn employee who DEQ talked to at the site, EUENGINE2 catalyst is not connected because the facility can meet emission limits without the catalyst. Based on review of the engine maintenance reports, EUENGINE1 was not operated without the catalytic converter connected and operating. The catalytic converter was last cleaned and replaced in August 12, 2013. The engines were shut down while performing general maintenance such as: replacing filters, valves, spark plugs, oxygen sensors, and/or repair leaks. EUENGINE2 appeared to have a frame overhaul on August 14, 2014, but this engine was not changed out for a different engine based on Field Inspection Reports that show the same make, model, and serial number throughout the year (before and after the frame overhaul). Additionally, general maintenance was performed on EUENGINE2 throughout the year. The records did not show maintenance concerns with the engines.
 - Testing/Sampling:** The facility used engine specific emission factors to calculate the emissions for NOx and CO. Performance testing has not been completed at this facility.
 - Monitoring/Recordkeeping:** The facility monitors the natural gas usage for FGENGINES on a continuous basis and records the monthly fuel use for each engine at the facility. The facility records monthly and 12-month rolling time period calculations for NOx and CO. The 12-month rolling time period emissions are discussed above under emission limits. The natural gas usage, and monthly and 12-month rolling time period emissions records are attached.
 - Reporting:** The facility has not swapped out an engine at the facility since the PTI was issued.
 - Stack/Vent Restrictions:** Based on visible observations during the field inspection, the stacks of FGENGINES appeared to be in compliance with permitted limits of 39 feet and 27 feet above ground surface, respectively.
- Evaluation Summary:** Based on the field inspection and records review, the facility is in compliance with PTI 345-08A, and no further actions are necessary at this time.

NAME Angela Owens

DATE 4/21/15

SUPERVISOR 