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

N610047641

FACILITY: Riverside Energy Michigan, LLC - Custer Antrim CO2		**SRN / ID:** N6100
LOCATION: SW SW SEC 19 T29N R6W, MANCELONA		**DISTRICT:** Cadillac
CITY: MANCELONA		**COUNTY:** ANTRIM
CONTACT:		**ACTIVITY DATE:** 12/13/2018
STAFF: Caryn Owens	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MINOR
SUBJECT: Scheduled Inspection and Records Review		
RESOLVED COMPLAINTS:		

On Thursday, December 13, 2018, Caryn Owens of the DEQ-AQD conducted a scheduled field inspection of the Riverside – Custer Antrim facility (SRN: N6100) located in the southwest quarter of the southest quarter of Section 19, Township 29 North, Range 6 West in Mancelona Township, Antrim County, Michigan. More specifically, the site is located on the east side of Johnson Road, just north of West Elder Road in Mancelona, Michigan. It is recommended to meet a company representative on site since typically the entrance to the facility is gated and locked. The field inspection and records review were to determine compliance with permit to install (PTI) 550-97B. This facility is currently considered a minor source. However, due to the PTI Condition VII.1 under Reporting for EUENGINE1 with regard to changing out an engine at the facility, this source should be considered an Opt-Out Source.

The site is an area source for National Emission Standards for Hazardous Air Pollutants (NESHAP) from Oil and Natural Gas Production facilities (40 CFR, Part 63, Subpart HH), and NESHAP for Stationary Reciprocating Internal Combustion Engines (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 MDEQ at this time.

Evaluation Summary
The activities covered during this field inspection and records review appear to be in compliance with PTI 550-97B. Review of the records for the facility indicates the facility was in compliance with emission limits in accordance to the PTI. No further actions are necessary at this time. Specific permit conditions that were reviewed are discussed below.

Source Description:
DEQ was accompanied by Art Steinka of Riverside Energy during the field inspection. The site was covered in snow, and the weather conditions were cloudy, with calm winds, and 31 degrees Fahrenheit. There were three main buildings on the site, with a few out buildings for storage and sales. The southern-most building on site is a former CO2 plant that is shut-in and not used anymore and was removed from the PTI in April 2010. The central-main building at the site is the compressor building. This building contains two gas separators and two water separators; one of the gas and water separators are for the Custer 35 wells, and one of the gas and water separators are for the Custer Antrim wells. The gas from both the Custer 35 and Custer Antrim go through the compressor engine for further processing. A glycol dehydrator was also present to remove water from the gas stream prior to further processing. Additionally, a sulfa-clear system is located on the outside east of the compressor building to remove any potential sulfur in the gas stream.

The compressor engine was a 1265 horsepower (hp) Caterpillar 3516LE, identified at the site as Unit #111072, and was operating for 69,184 hours as indicated on the hour meter. The engine contained an oxidation catalyst, and was operating at 1004 revolutions per minute, 183 degrees Fahrenheit, and 54 pounds per square inch of pressure. The oxidation catalyst inlet temperature was 807 degrees Fahrenheit, and outlet temperature was 775 degrees Fahrenheit. The engine stack contained a muffler and was approximately 42 feet above ground surface (ags), no visible emissions were observed from the compressor engine stack.

The CO2 plant was located in the northern-most main building at the site. This building contained a lot of piping, a glycol dehydrator, and a amine system. There are three stacks associated with the amine reboiler, which were approximately 30 feet ags, and the glycol reboiler stack was approximately 28 feet ags. The CO2 stack is located outside on the eastern portion of the northern-most building, and is approximately 55 feet ags.

Records Reviewed

EUENGINE1: A Caterpillar 3516LE natural gas fired reciprocating internal combustion engines, at 1265 hp.

- **Emission Limits:** Emission limits were 60 tons of NOX per year based on a 12-month rolling time

period, and 30 tons of CO per 12-month rolling time period. Based on the records reviewed from January 2017 through November 2018, the highest emissions reported were 13.35 tons of NOx per 12-month rolling time period, and 12.69 tons of CO per 12-month rolling time period, which were within the permitted emission limits.

- **Materials/Fuels:** According to Riverside Energy, the highest amount of sulfur in the inlet gas stream was 0.8 ppm of sulfur, which is less than the amount allowed in the natural gas stream. Therefore, no sour gas is burned at the facility.
- **Process/Operational Parameters:** The facility submitted a Malfunction Abatement Plan (MAP) on November 16, 2015 and was approved by the DEQ on January 21, 2016 to address the Caterpillar lean burn engine at the facility. Based on the maintenance records, the engine was generally inspected on a regular basis. The engine was shut down for a total of 249.85 hours from October 2017 through December 12, 2018, for general maintenance on the engine, such as: replacing filters, replace spark plugs, and/or repair leaks. The records did not show maintenance concerns with the engine.
- **Design/Equipment Parameters:** The facility appears to be operating the control device properly. Additionally, the facility monitors the natural gas on EUENGINE1 on a continuous basis.
- **Testing Sampling Equipment:** The facility used engine specific emission factors to calculate the emissions for NOx and CO. Performance testing has not been completed at this facility. Verification of the sulfur content in the field gas is attached to this inspection report.
- **Monitoring/Recordkeeping:** The facility monitors the natural gas usage for EUENGINE1 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 records for NOx and CO. The 12-month rolling time period emissions are discussed above under emission limits. The facility maintains a log of maintenance activities on EUENGINE1, which is discussed in more detail under Process/Operational Parameters above. The calculations and records are completed in an acceptable manner.
  Additionally, the EUENGINE1 has not operated without a catalyst from October 2017 through November 2018.
- **Reporting:** The facility has not swapped out an engine at the facility since the previous inspection report and most updated MAP.
- **Stack/Vent Restrictions:** Based on visible observations during the field inspection, the stack of the engine appeared to be at least 42 feet ags and less than 12-inch diameter.
- **Other Requirements:**
  Based on the field inspection it appears a natural gas monitoring device has been installed appropriately, and the stack height of EUENGINE1 appears to be in compliance with the permitted limits. Additionally, EUENGINE1 is subject to the NESHAP for Stationary Reciprocating Internal Combustion Engines (40 CFR, Part 63, Subpart ZZZZ). The State of Michigan does not have delegated authority of the area source NESHAP, and thus compliance with the federal requirements in accordance with the EUENGINE1 was not reviewed by the DEQ at this time.

EUCUSTCO2: An Amine plant for removing CO2 from the natural gas stream.

- There are no Process/Operational Parameters, Design/Equipment Parameters, Testing/Sampling Requirements, Reporting Requirements, and Other Requirements associated with EUCUSTCO2.
- **Emission Limits:** Based on the records reviewed for the months of February 2018 and July 2018, the highest CO2 emissions reported were 22,308 pounds of CO2 per day, which is less than the permitted 290,010 pounds of CO2 per day, which were within the permitted emission limits.
- **Materials/Fuels:** According to Riverside Energy, the highest amount of CO2 treated was 1,159,000 cubic feet per day, which is less than the permitted 2,500,000 cubic feet per day.
- **Monitoring/Recordkeeping:** The facility monitors and records the flow rate and carbon dioxide content of the natural gas entering EUCUSTCO2. The facility keeps continuous records of the flow rate and records the CO2 content on a daily basis. Calculations of the CO2 emission rate is recorded each day.
- **Stack/Vent Restrictions:** Based on visible observations during the field inspection, the stack of EUCUSTCO2 appeared to be at least 55 feet ags and about 6-inches in diameter.

EUDEHY: The 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. Riverside Energy is claiming the glycol dehydrators meet exemption R336.1288(b)(ii), which exempts glycol dehydrators that are located at a site or facility that only processes natural gas from the Antrim zone.

NAME Chuyn Owens DATE 12/20/18 SUPERVISOR SN