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

N583149459

FACILITY: Breitburn & Riviera - Wilderness CO2 & Hayes 29		**SRN / ID:** N5831
LOCATION: 10875 Geronimo Trail, GAYLORD		**DISTRICT:** Gaylord
CITY: GAYLORD		**COUNTY:** OTSEGO
CONTACT:		**ACTIVITY DATE:** 06/19/2019
STAFF: Bill Rogers	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Site inspection and record review		
RESOLVED COMPLAINTS:		

On June 19, 2019, Jodi Lundgren and I inspected the Maverick Resources Wilderness CO2 removal plant a the Riverside Hayes 29 CPF, which are combined under SRN N5831 and Renewable Operating Permit MI-R N5831-2014b. Mr. Jesse Green showed us around the facility during our inspection.

Ms. Diane Lundin of Riverside and Mr. Eric Hasso of Maverick provided me with records which are require the permit. This activity report covers my inspection of the facility and my review of the records provided.

The facility is located off Geronimo Trail, south off from Mancelona Road near the Antrim-Otsego County l MI-ROP-N5831-2014a is a sectioned ROP. Section 1 applies to Maverick's CO2 removal facility. Section 2 applies to Riverside's Central Production Facility.

WILDERNESS CO2 REMOVAL FACILITY, BREITBURN:

Source-Wide Conditions, Condition I.1 and I.2, set source wide NOx and CO emissions limits of 224 tons e per 12 month rolling time period. Combined reported emissions in this year's Michigan Air Emission Repo System were 104 tons of NOx and 58 tons of CO. I also added up engine emissions for May and got 101.8 NOx and 56.8 tons CO. These totals comply with the permit conditions.

Condition 1.3 and 1.4 set source wide Hazardous Air Pollutant (HAP) limits of less than 10 tons per 12 mor rolling time period for each individual HAP and 25 tons per 12 month rolling time period for combined HAF Engine emissions sheets, attached, report a total (including both Maverick and Riverside sections of the facility) of 9.1 tons HAP per 12 month rolling time period. This complies with the 25 tons total HAP per yea source wide condition. As total HAPs are less than 10 tons, it also indicates compliance with the condition no individual HAP emission may be more than 10 tons.

Note that the facility wide totals provided by Maverick do include emissions from the Riviera Hayes 29, as should.

Condition III.1 requires burning only sweet natural gas in the facility. I did not see or smell any evidence of gas at the facility.

Conditions VI.1, 2, and 3 require keeping and providing acceptable monthly and 12 month rolling time peri records for CO, NOx, and HAP emissions. Emissions records comply with these permit conditions.

ENGINES

The Caterpillar engines are distributed in three engine sheds, in a line east to west; all of them are west of shed which contains the two Waukesha engines. Please see attached map provided to me by Jodi Lundgr

Engine Identifications:

EUENGINE1	Unit 831	"C5"	Cat 3615 LE	No control	Not operating: down for service
EUENGINE2	Unit 856	"C7"	Cat 3615 LE	Catalytic oxidizer	
EUENGINE3	Unit 885	"C8"	Cat 3615 LE	Catalytic oxidizer	
EUENGINE4	Unit 907	"C10"	Cat 3615 LE	Catalytic oxidizer	

EUENGINE5	CO2-2	"C2"	Waukesha L-7042	Catalytic oxidizer	Not operating since before 2014
EUENGINE6	CO2-1	"C3"	Waukesha L-7042	Catalytic oxidizer	
EUENGINEH29	Hayes 29		Waukesha L-7042	Catalytic oxidizer	Separate ownership, Riviera Energy

These engines are covered under three tables: FGCATENGINES for EUENGINE1, 2, 3, and 4; FGWAUKENG for EUENGINE5 and 6; and the Hayes 29 section of this sectioned permit for EUENGINEH29, which is oper by a different company from the rest.

Table FGCATENGINES: Four Caterpillar engines, model 3516LE. EUENGINE2, EUENGINE3, and EUENGINE equipped with catalytic oxidizers.

Section I of the table sets NOx and CO limits for Engines EUENGINE1, 2, 3, and 4.

Engine	NOx limit (tons)	NOx actual (tons)	CO limit (tons)	CO actual (tons)
EUENGINE1	23.1	18.0	20.8	16.1
EUENGINE2	23.1	18.8	4.5	3.4
EUENGINE3	23.1	18.1	4.5	3.3
EUENGINE4	24.4	15.5	4.2	3.7

These values comply with the permit conditions.

Condition III.1 limits operating any engine which should have an add-on control device to 200 hours per ye less of operation without that control device. Review of operational log sheets (examples attached) did not any operation without the oxidation catalysts. This complies with the permit condition.

Condition III.2 requires a Malfunction Abatement Plan. The most recent approved MAP was received June 2018. This complies with the permit condition.

Condition III.3 requires any add on control device be installed and operating properly. The control devices appeared to be installed and operating properly at the time of our inspection. Exhaust temperature reading and test records (examples attached) indicate proper operation. This complies with the permit condition.

Condition IV.1 requires thermocouples to measure temperatures in oxidation catalysts. All oxidation catal had them. This complies with the permit condition.

Conditions VI.1through VI.7 require monitoring and recording various values, all of which are included on emission estimate sheets or maintenance logs; examples of these records are attached. The items recorde are:

1. natural gas usage for each engine, on emission sheet
2. Differential pressure across catalyst, test sheets included
3. Inlet and outlet catalyst temperatures, as "exhaust temperature" on each engine that has a catalyst on daily operator log
4. Maintenance logs, example sheets attached
5. Hours of operation without add on control device; lack of control device would be marked on daily operator l
6. Monthly fuel records for each engine, on emission sheet
7. Monthly and 12 month NOx and CO emissions, on emission sheet

Conditions VIII.1 through 4 set stack dimensions as maximum of 16 inches diameter and a minimum heigh 37.5 feet. The stacks appear to meet these conditions.

Table FGWAUKENGINES: Two Waukesha L-7042 rich burn engines. Only one, EUENGINE6, is operating. T other has not operated for many years but could be returned to service if needed.

Condition I.3 limits NOx from EUENGINE6 to 24.6 tons per 12 month rolling time period. Reported emissio are 14.6 tons. This complies with the permit condition.

Condition I.4 limits CO from EUENGINE6 to 41.1 tons per 12 months. Reported emissions are 27 tons per 1 months. This complies with the permit condition.

Condition III.1 prohibits burning sour gas in equipment on site. I did not see or smell anything which woul make me believe sour gas was being used.

Condition III.2 limits operating any engine which should have an add-on control device to 200 hours per ye less of operation without that control device. Review of operational log sheets (examples attached) did no any operation without the oxidation catalyst. This complies with the permit condition.

Condition III.3 requires a Malfunction Abatement Plan. The most recent approved MAP was received June 2018. This complies with the permit condition.

Condition III.4 requires any add on control device be installed and operating properly. The control device appears to be installed and operating properly at the time of our inspection. Exhaust temperature readings test records (examples attached) indicate proper operation. This complies with the permit condition.

Condition IV.1 requires a thermocouple or gauge to measure temperatures in the oxidation catalyst. The oxidation catalyst had thermocouples. This complies with the permit condition.

Conditions VI.1, 2, 3, 6, 8, 9, 10, and 11 require monitoring and recording various values, all of which are included on emission estimate sheets or maintenance logs; examples of these records are attached. The i recorded are:

1.natural gas usage for each engine, on emission sheet

2. and 3. Differential pressure across catalyst, test sheets included

6.Inlet and outlet catalyst temperatures, as "exhaust temperature" on each engine that has a catalyst on d operator log

8.Maintenance logs, example sheets attached

9.Hours of operation without add on control device; lack of control device would be marked on daily opera log

10.Monthly fuel records for each engine, on emission sheet

11.Monthly and 12 month NOx and CO emissions, on emission sheet

Conditions VIII.1 and 2 set stack dimensions as maximum of 16 inches diameter and a minimum height of feet. The stacks appear to meet these conditions.

Table FGRURALSIRICEMACT

This table requires oil changes or an engine oil analysis program. The engines at this source are under an engine oil analysis program, and example analysis sheets are attached.

The table also requires a maintenance log. As discussed above, the company has a maintenance log. Exa sheets are attached.

Section 2 of ROP. Hayes 29 Facility. Table EUGLYCOLDEHYDRATOR

This table requires compliance with the National Emission Standards for Hazardous Air Pollutants, Subpa This subpart requires some stringent pollution control measures unless certain exemptions are met.

One of the exemptions is for glycol dehydrators that process less than approximately 3 million standard c feet per day. Riverside, the operator of this dehydrator, has submitted documentation which indicates the dehydrator complies with Subpart HH by meeting this exemption.

Table EUENGINEH29

Condition I.1 sets a NOx limit of 24.6 tons per 12 months. Emissions calculations, attached, claim emissio 16.6 tons per 12 months. This complies with the permit condition.

Condition I.2 sets a CO limit of 41.1 tons per 12 month rolling time period. Emission calculations, attached claim 3.15 tons per 12 months. This complies with the permit condition.

Condition III.1 limits operation without the add on control device to 200 hours per year. A catalyst mainten sheet, attached, claims there has been no operation without the control device in the past year. This comp with the permit condition.

Condition III.2 requires a Malfunction Abatement Plan. The most recent MAP for this facility came in Janua 17, 2019. AQD approved it. This complies with the permit condition.

Condition III.3 requires the add on control device be installed and operating properly. During our inspectio appeared to be installed and operating properly.

Condition III.5 requires thermocouples to measure catalyst temperature. These are present as required.

Condition VI.1 requires monitoring fuel gas used. This is included on the emission sheet, attached. This complies with the permit condition.

Condition VI.2 requires monthly pressure checks across the oxidation catalyst. The result of the most rece test is included on the monthly catalyst maintenance form, attached.

Condition VI.3 requires recording inlet and outlet temperature on the catalyst. This is being done. Compan personnel informed me this is recorded in columns of the attached operator's log form as "Stage 3" and "S 4" temperatures, but it is there as required.

Condition VI.4 requires a maintenance log. Example sheets are attached.

Condition V.5 requires recording hours of operation without the add on control device. This is on the mont catalyst maintenance form. This complies with the permit condition.

Condition V.6 requires monthly fuel use records. This is included on the monthly emission estimate forms complies with the permit condition.

Condition V.7 requires NOx and CO emission calculations. These are included on the monthly emission estimate forms and comply with the permit condition.

Condition VIII.1 requires a maximum stack diameter of 16 inches and minimum height of 40 feet. The stack appears to meet these requirements.

COMMENTS

The facility also has 6 gas heaters and 2 inline heaters for oil and gas. All these are natural gas fired. On s we found builder's plates indicating 1 million btu per hour capacity. The rest appeared to be the same size were probably of similar capacity.

There are 5 400-barrel size storage tanks for oil and brine, inside a berm.

EUENGINE6, the Waukesha compressor engine, was operating at the time of our inspection. Inlet temperat on the catalyst was 993 and outlet 1060 degrees f. It was running at 922 RPM. Compressor oil temperature 140 degrees, engine oil pressure 40 psi, compressor oil pressure 45 psi.

It shared its shed with EUENGINE5, which was not running. Each engine had two 300 gallon drum on stilts style tanks associated with it, one of engine oil and one of compressor oil.

EUENGINE1 /Unit 831/ C5 was shut down for servicing.

EUENGINE2 /Unit 856/ C7 was operating. The digital display for this Caterpillar engine indicated coolant 18 degrees f, oil 56 psi, electrical 25v, 1165 RPM, 108504 hours of operation. Catalyst temperatures were 921 degrees f in, 909 out. It had two 300 gallon drum on stilts tanks associated, one for engine oil and one for compressor oil.

EUENGINE3 / Unit 885 / C8 was operating. The digital display for this engine indicated coolant 184 degrees 58 psi, 26 volts, 1157 rpm, 59182 hours. Catalyst inlet was 841 and outlet 906 degrees f.

EUENGINE4/ Unit 907/ C10 was operating. The digital display for this engine indicated coolant 189 degrees 63 psi, 26 volts, 1152 rpm, 97486 hours. Catalyst inlet was 887 and outlet 876 degrees f.

The Hayes 29 engine was operating. The digital display for this engine indicated coolant 188 degrees f, oil psi, 27 volts, 1085 rpm, 114876 hours. There were two 300 gallon drum on stilt tanks associated with this engine, one engine oil and one compressor oil.

Maintenance appeared adequate. I did not see any leaks or any stained soils that might indicate prior leaks

NAME William J Rogers L. DATE 7/19/19 SUPERVISOR