DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Stack Test Observation

N583129502

FACILITY: Breitburn Energy Company - Wilderness/Hayes 29		**SRN / ID:** N5831
LOCATION: 10875 Geronimo Trail, GAYLORD		**DISTRICT:** Cadillac
CITY: GAYLORD		**COUNTY:** OTSEGO
CONTACT: Carolann Knapp , EH&S Regional Rep (Breitburn)		**ACTIVITY DATE:** 04/21/2015
STAFF: Caryn Owens	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Stack Test Observations for Breitburn's engines (EUENGINE1, EUENGINE2, EUENGINE3, EUENGINE4, and EUENGINE6) and Linn's engine (EUENGINEH29) from April 21st-23rd, 2015.		
RESOLVED COMPLAINTS:		

On April 21 through April 23, 2015, Ms. Caryn Owens of the DEQ-AQD observed a scheduled stack test, as required by MI-ROP-N5831-2014a, at the Wilderness CO2 – Hayes 29 Central Processing Facility (CPF), located at 10875 Geronimo's Trail, Gaylord, Otsego County, Michigan (SRN N5831). DEQ staff observed the facility conditions to assess whether typical operations were being conducted during the stack testing procedures. On April 21, 2015, the stack test included observations of EUENGINEH29 (which is a remote 1,085 hp CAT G3516TALE (lean burn) reciprocating internal combustion engine (RICE), controlled with an oxidation catalyst). Erik Vincke with Gosling Czubak and Diane Lundin of Linn Energy were also present during testing of EUENGINEH29 to record engine operating parameters during the stack test. EUENGINEH29 is owned and operated by Linn Operating, LP and is covered in Section 2 of the ROP for the facility. The stack test was being conducted by Derenzo and Associates, Inc. (Derenzo), and they were analyzing NOx and CO emissions from the engine. Jeremy Howe, DEQ-Technical Programs Unit (TPU) arrived onsite to observe stack testing protocols and procedures, and cross-checked the values that Derenzo was deriving. EUENGINEH29 was well below the ROP emission limits for all three tests. Ms. Owens observed engine operating parameters of EUENGINEH29 during stack testing which indicated the engine was operating at 1,187 RPM, 60 psi, and 187 °F. The inlet temperature of the oxidation catalyst was 848 °F and the outlet temperature was 828 °F. The air/fuel ratio controller (AFRC) read Left bank 0.686 phi and Right bank 0.000 phi. DEQ left after Derenzo was completed with EUENGINEH29. Derenzo set-up on Breitburn Operating, LP (Breitburn) – Wilderness CO2 CPF EUENGINE4 for the next stack test.

On Wednesday, DEQ stopped back at the facility, and Derenzo was testing Breitburn's engines, which consisted of four Caterpillar lean burn engines and one rich burn Waukesha engine. Ms. Owens stopped by the office and talked to Ms. Carolann Knapp of Breitburn. Ms. Owens received a copy of the fuel usage from Breitburn's engines from April 21, 2015. Ms. Knapp was recording the fuel usage every 15 minutes during the stack test runs. Ms. Knapp said that the fuel usage from April 21st is similar to the fuel usage on April 22, 2015. Derenzo completed stack testing on EUENGINE4, EUENGINE2, and EUENGINE3 (which were remote Caterpillar G3516TALE (lean burn) RICEs, controlled with oxidation catalysts) on April 22, 2015. Ms. Owens recorded engine parameters of the engines that were tested on April 22nd. The following are the engine parameters recorded:

EUENGINE4 was operating at 1,125 RPM, 65 psi, and 182 °F. The inlet temperature of the oxidation catalyst was 827 °F and the outlet temperature was 808 °F. The air/fuel ratio controller (AFRC) read Left bank 0.685 phi and Right bank 0.000 phi.

EUENGINE3 was operating at 1,117 RPM, 62 psi, 185 °F. The inlet temperature of the oxidation catalyst was 807 °F and the outlet temperature was 781 °F. The air/fuel ratio controller (AFRC) read Left bank 0.672 phi and Right bank 0.000 phi.

EUENGINE2 was operating at 1,114 RPM, 59 psi, 181 °F. The inlet temperature of the oxidation catalyst was 855 °F and the outlet temperature was 830 °F. The air/fuel ratio controller (AFRC) read Left bank 0.671 phi and Right bank 0.000 phi.

DEQ returned to the stack test on Thursday, April 23, 2015 to observe the stack tests on EUENGINE6 (which is a remote 1,478 hp Waukesha L-7042 GSI rich burn RICE with a 3-way catalytic converter for control) and EUENGINE1 (which is a remote Caterpillar G3516TALE (lean burn) RICE with no control). The following are the engine parameters recorded from April 23rd:

EUENGINE6 was operating at 887 RPM, 60 psi, 175 °F. The inlet temperature of the 3-way catalytic catalyst was 929 °F and the outlet temperature was 977 °F. The air/fuel ratio controller (AFRC) read Left bank 0.77 v 754 and Right bank 0.75 v 965.

EUENGINE1 was operating at 1,101 RPM, 54 psi, 185 °F.

The stack testing appeared to run smoothly, and the engines were operating at typical engine parameters. Mr. Howe checked Derenzo's calculations, and testing appeared to be below the emission limits established for each engine. Along with Ms. Knapp recording the fuel usage every 15 minutes, there was a technician from Exterran recording the differential pressure and the catalyst temperatures of each engine during testing of the engines.

Results from the stack test should be submitted within 60 days of April 23, 2015, which will be reviewed by the DEQ to determine compliance status.

NAME Carrie Owens DATE 4/23/15 SUPERVISOR