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

N753846896

FACILITY: Linn Operating, LLC - Wild West Booster		**SRN / ID:** N7538
LOCATION: SE4 NE4 SE4 SECTION 16 T30N R4W, HAYES TWP		**DISTRICT:** Gaylord
CITY: HAYES TWP		**COUNTY:** OTSEGO
CONTACT: Diane Lundin , Senior EHS Representative		**ACTIVITY DATE:** 11/09/2018
STAFF: Sharon LeBlanc	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** SM OPT OUT
SUBJECT: unannounced, scheduled site inspection for fiscal year 2018. sgl		
RESOLVED COMPLAINTS:		

On November 9, 2018, AQD District Staff mobilized to the Linn Operating LLC – Wild West Booster (N7538), located in the SE1/4, NE 1/4, SE 1/4 Section 16, T30N, R4W, Hayes Township, Otsego County, Michigan to conduct an unannounced, scheduled, compliance inspection of the facility. The referenced facility presently operates under Permit to Install No. 264-05. A records request was made electronically on September 24, 2018. Records were received electronically on December 10, 2018.

The most recent compliance inspection was November 10, 2015. No compliance issues noted at that time.

FACILITY

The referenced facility is a gated (at the road) and unmanned booster station operated by Linn Operating LLC (AKA Linn). The station is reported to service Antrim Formation wells in the area. Activities onsite compression of Natural Gas (NG) to transport it down the pipeline.

To reach the Facility staff traveled west from the Gaylord Field Office on County Road C-42 (aka Alba Road), then turned left (south) on Hayes Tower Road and traveled approximately 2.5 miles to the intersection of Old Alba Road and Hayes Tower Road. Make a right on Old Alba Road, and travel 1 ¼ - mile west to Big Bowl Drive. Make a right-hand turn on Big Bowl Drive and travel under ½-mile to the north. The Facility drive is on the right-hand side (east) of the drive. Patience Path is just north of the drive and to the left.

A review of aerials appears to indicate that prior to December 2005, the Facility was merely a pumping station. Inactive at the time of the inspection the well Linn Thomas Lake I C4-16) still exists onsite. The compressor building first showed up on site in an August 2006 aerial. Operators of record based on correspondence in District files include:

- **Quicksilver Resources, (2005- 2007)**
- **Breitburn, (2007 - 2013) and**
- **Linn (AKA Linn Energy, Linn Operating, Inc and Linn Operating LLC) (2013 - Present)**

At the time of the November 9, 2018, site inspection, weather conditions consisted of completely overcast skies, snow showers and temperatures of 29 degrees F. Winds were in general from the west.

REGULATORY

Permitting -The referenced facility operates under Permit to Install (PTI) No. 264-05, which was issued to Quicksilver Resources, Inc. in November 2005. The PTI was issued as an opt-out permit, At the time of permitting the facility consisted of one NG-fired compressor and was reported to be a true minor source of criteria pollutants. The referenced permit limits the total emissions to less than 90 tons per 12-month rolling time period for NOx and CO.

Though not identified in the permit, the facility may be subject to Federal Regulation. Subparts frequently associated with oil and gas facilities are identified below. Note however, that compliance with these subparts has not been determined as part of this inspection.

Federal Regulations - The referenced facility does not process or store petroleum liquids, nor store them onsite and is therefore appears to not be subject to 40 CFR Part 60 (New Source Performance Standards AKA NSPS) Subparts;

- K, Ka or Kb (Storage vessels for Petroleum Liquids);
- KKK (Equipment Leaks of VOC from onshore NG Processing Plants);
- VV (Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry);

In addition, the existing engine has an installation dates later than 1995, which would make it potentially subject to NSPS Subparts IIII and JJJJ for Compression Ignition (CI) RICE and Spark Ignition (SI) RICE, respectively. AQD at this time has no delegated authority for the subparts.

Subpart OOOO would apply to onshore affected facilities that are constructed, modified or reconstructed after August 23, 2011. Based on available information it appears that the referenced subpart is not applicable at this time but that future changes may be subject to the referenced subpart.

With respect to 40 CFR Part 63 (Maximum Achievable Control Technology Standards) the following Subparts may apply:

- Subpart HH (HAPS from Oil and NG Production Facilities)
- Supbart ZZZZ (RICE)

With respect to Subpart HH, the affected unit is believed to be a dehy unit. However, the facility does not have a dehy unit and is not a production facility, so the subpart does not apply.

With respect to Subpart ZZZZ, the facility in their June 10, 2014, Semi Annual Compliance Status Report Linn indicated that the engine associated with the site at that time was/were existing, stationary spark ignition (SI) RICE with a site rating of less than 500 brake Hp located at an area source of HAPs subject to the referenced subpart. Subpart ZZZZ submittals of record in the District Files included:

- December 20, 2010, Initial Notification Submittal, and
- October 18, 2013, Renotification Submittal

The document(s) identified the Wild West Booster as subject to initial Subpart ZZZZ testing and further indicated that testing had been completed. Copies of the test report for the Waukesha RICE conducted on October 10, 2013, may be found in District files.

Required compliance reporting on file included:

- January 23, 2014, Semi Annual Compliance Status Report, and
- June 10, 2014, Semi Annual Compliance Status Report

The later of the two documents reported a catastrophic malfunction of the Waukesha Model 3521 RICE and replacement on January 25, 2014 with a Caterpillar 3408 HCTA SI 4SRB and less than 500 HP. It further reported that the Facility no longer is subject to annual stack testing or semi-annual compliance reports.

EQUIPMENT

Previous site visits identified one compressor onsite. The November 10, 2015, site visit documented a change in RICE from the permitted Waukesha to a Cat 3408 HTCA with a three-way catalyst. However, records for the Facility also identified line heaters to be associated with the Facility present onsite.

Heavily overcast conditions and snowfall were documented at the time of the November 9, 2018, site inspection, no Visible Emissions (VEs) were or heat shimmers were noted from exhaust stacks onsite.

Review of District Files and annual emissions reports submitted by the facility indicate that at the time of permitting, one 773 Hp Waukesha engine was being permitted onsite. Documentation in Linn Spreadsheets indicates that during installation of the catalyst on the Waukesha it was noted that the HP had been reported incorrectly, and that instead of 773 HP it as actually 534 HP. Electronic correspondence dated February 13, 2014, documented a rod being blown on the Waukesha engine onsite. The document also indicated that the existing waukesha though permitted without pollution controls, had an added catalyst to meet Subpart ZZZZ emission requirements for engines > 500 Hp in non-remote areas. Instead of replacing the engine like for like, Linn proposed replacing the Waukesha with a smaller Cat 3408 with catalyst, which would not result in an increase in emissions. The replacement was approved by the District Supervisor at that time.

No records indicating engine swap outs/changes after 2014 were found in District Files. An engine swing in 2017, was noted during records review of Linn documents It has been noted that a limited number of Linn Facilities have conducted "engine swings" of same model-same size engines without notification or submittal of documentation showing no change in emissions for the unit. The company indicated that prior AQD management had indicated that the notifications were not necessary in the case of swings, and has agreed to notify for all future swings. The following summarizes engine history of record.

ENGINE ID*	ENGINE TYPE	INSTALLATION DATE	REMOVAL DATE	COMPANY OPERATING EU
EUENGINE	Waukesha 3521 GU 773 HP 4 Stroke Rich Burn No Catalyst	11/9/2005	October 2013	Quicksilver Resources Inc. later Linn
EUENGINE*	Waukesha 3521 GU 534 HP 4 Stroke Rich Burn Catalyst	October 2013	1/25/2014	Linn
EU-Engine 3408**	Cat 3408 HCTA Rich Burn 405 HP with 3-way catalyst	3/12/2014	engine swing reported on 6/15/2017	Linn (Operating Unit 303595)

* these IDs reflect MAERS ID's for Engines reported for Facility.

** The original ID plate for the CAT was not visible, however, a newer ArchRock plate was visible, and indicated a S/N of 6NB01803 and rebuild date of 7/5/2016.

Operational parameters for the referenced engine consist of the following:

Date	Engine	RPMS	Source
11/9/2018	Cat 3408 HCTA	1752	Inspector/Onsite Daily Log

Daily Compressor Logs provided for the period of January 2, 2016 through November 1, 2018, indicated RPMs, pre and post catalyst temperatures are consistent and within acceptable ranges per the PM/MAP for the Facility.

COMPLIANCE

At the time of the November 11, 2018, site visit, no visible emissions were noted to be coming from onsite stacks.

Note that Permit 264-05 requires maintenance of most records for a period of 5 years. As the previous site inspection was conducted on November 10, 2015, records were only requested for the calendar years of 2016, 2017 and 2018 to date.

MAERS- The Facility reports annual emissions as part of the MAERS. Review of the most recent MAERS submittal for the facility (received on February 28, 2018 for emissions associated with the calendar year 2017) included emissions for a single RICE onsite.

Total emissions reported for the calendar years 2015, 2016 and 2017 for MAERS as well as random dates from data submitted as part of the information request to Linn are summarized below:

	NOX (tpy)	CO (tpy)

CALENDAR YEAR		
2015	4.16	8.66
12-month rolling ending October 2016	4.44	9.25
2016	4.43	9.23
12-month rolling ending August 2017	7.58*	15.80
2017	4.25	8.85
12-month rolling ending August 2018	4.24	8.83
EMISSION LIMITs	< 90 (SC 1.1a)	<90 (SC 1.1b)

* Fuel usage for the month of August 2017 was significantly higher than previous and following months (increase of 24 MMcf).

Permit Conditions -Special conditions (SC) associated with Permit No. 264-05 are limited to those associated with one RICE referred to as EUENGINE in the referenced permit.

Emission limits for EUENGINE are defined in SC 1.1a and 1.1b and limit CO and NOx emissions to less than 90 tons/year based on a 12-month rolling time period for each referenced parameter. In compliance with the permit, calculation of actual emissions on a monthly and 12-month rolling total for CO and NOx are required under SC 1.10 and 1.11. These two conditions also specify that emissions will be determined using emission factors from Appendix A. As can be seen by the MAERS reported emissions above, the Facility is clearly below permit limits for CO and NOx, and review of the submittal as well as records provided as part of those requested from the facility indicates that they are calculated per Appendix A.

With respect to material limits EUENGINE is limited to use of sweet natural gas for fuel (SC 1.2). Verification of H2S and/or sulfur content of the fuel may be requested by the AQD District Supervisor under SC 1.5. H2S content was verified by Linn on September 25, 2018 to be 1ppm and shows compliance with the sweet NG usage requirement.

SC 1.6 and SC 1.9 requires monitoring of natural gas usage and maintenance of monthly fuel use records, respectively. No limit to volume of gas burned for fuel is specified in the permit. Month long chart recorders were noted onsite at the time of the inspection. Records provided by Linn indicate that they are being collected and maintained in compliance with permit conditions.

The permitee under permit 264-05 is required to submit a Preventative Maintenance/Malfunction Abatement Plan (PM/MAP) for EUENGINE (SC 1.3) and keep a log of all significant maintenance activities conducted and repairs made (SC 1.8). District Files contain copies of the following PM/MAP documents:

- April 3, 2007, PM/MAP (received April 4, 2007 and approved July 26, 2007),
- June 6, 2014, PM/MAP (received June 12, 2014 and approved July 2, 2014) and
- April 24, 2018, PM/MAP (received April 27, 2018 and approved May 14, 2018).

The most recent PM/MAP indicates that the following activities will be conducted approximately every 2,160 hours of operation or annually (whichever comes first) to meet maintenance requirements under Subpart ZZZZ:

- Oil and oil filter change,
- Inspect spark plugs and replace as necessary, and
- Inspect all hoses and belts and replace as necessary.

A review of records provided by Linn indicated that the subpart ZZZZ activities are being conducted quarterly as a general practice in compliance with their PM/MAP.

In addition to Subpart ZZZZ maintenance activities the PM/MAP indicates that pre and post catalyst temperatures will be monitored daily, and differential pressure across the catalyst will be recorded monthly. If the referenced monitoring variables are reported out of range, the facility will within 5 days confirm emission reduction efficiencies, clean the catalyst face and replace the catalyst gasket.

A review of maintenance records provided by Linn, indicated that the Facility has contracted staff conducting monthly catalyst inspections, verification testing, AFRC adjustments (or replacements when necessary) on a monthly basis. It also appears that catalyst cleanings are also routinely conducted.

Date	Pre-Catalyst	Post-Catalyst	Differential Pressure
11/9/2018	792	817	Not Recorded
11/1/2018	--	--	5.8
Operational Range	>700 degrees	>700 to < 1350 degrees	6.4 – 8.4 Inches (established 5/9/18)

Per the PM/MAP, replacement of Air to Fuel Ratio (AFRC) is scheduled to be conducted during emission verifications or sensor failure. The referenced activities are conducted in conjunction with the contracted monthly emissions checks when warranted. Based on the most recent differential pressures (above), Linn has scheduled an event.

At the time of the November 9, 2018 site inspection, contracted engine maintenance activities appeared to be conducted by Correct Compression Inc. Reports provided indicated a regular maintenance schedule, and general compliance with the permit condition being conducted by ArchRock..

Note that in addition to maintaining a log of all significant maintenance activities, SC 1.8 requires that if EUENGINE is replaced, the permittee shall notify the AQD District Supervisor of such a changeout and submit acceptable emissions data to show that the new EU is equivalent or less emitting from the engine replaced. Electronic correspondence dated February 13, 2014, indicates that information was provided to the District Supervisor, and that the replacement engine was approved, in compliance with permit conditions.

As previously noted, review of Linn records identified an engine swing that occurred in 2017. Based on discussions earlier in 2018, with Linn for other Facilities with similar swings, the company is aware that swings are not considered exempt from notification of the District and has agreed to complete the proper notifications in the future.

SC 1.12a restrict the maximum diameter of the stack for EUENGINE to 16-inches, and a minimum height of 40 ft above land surface. The Facility reports that the existing stack is a 6-inch diameter with a total height of 40 ft above land surface.

SUMMARY

On November 9, 2018, AQD District Staff mobilized to the Linn Operating LLC – Wild West Booster (N7538), located in the SE1/4, NE 1/4, SE 1/4 Section 16, T30N, R4W, Hayes Township, Otsego County, Michigan to conduct an unannounced, scheduled compliance inspection of the facility. The referenced facility presently operates under Permit to Install No. 264-05.

The previous compliance inspection was November 10, 2015. No compliance issues noted at that time.

A records request was made electronically on September 24, 2018. Records requested were received on December 10, 2018. Based on observations made at the time of the site inspection, as well as supplemental data received from the company it appears that with the exception of the failure to notify for the 2017 engine swing, the facility is operating in general compliance with it's permit conditions.

NAME Shawn U Blane DATE 12/17/2018 SUPERVISOR _____