

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

FCE Summary Report

Facility : Linn Operating, LLC - Maple Forest 1-3 CPF	SRN : N7575
Location : SW NE NW OF S3 T28N R3W	District : Gaylord
	County : CRAWFORD
City : MAPLE FOREST State: MI Zip Code : 49733	Compliance Status : Compliance
Source Class : SM OPT OUT	Staff : Sharon LeBlanc
FCE Begin Date : 10/1/2016	FCE Completion Date : 10/1/2018
Comments : synthetic minor FCE for Fiscal Year 2019. sgl	

List of Partial Compliance Evaluations :

Activity Date	Activity Type	Compliance Status	Comments
10/01/2018	Scheduled Inspection	Compliance	unannounced, scheduled site inspection for FY 2019.sgl
04/12/2018	MAERS	Compliance	2017 MAERS, facility uses manufacturer EF for determination of emissions for engines. Emissions determined consistent with previous years submittals.
02/09/2017	MAERS	Compliance	See MAERS for further details.

Name: *Sharon LeBlanc*

Date: *10/31/2018*

Supervisor: *SN*

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

N757546505

FACILITY: Linn Operating, LLC - Maple Forest 1-3 CPF		SRN / ID: N7575
LOCATION: SW NE NW OF S3 T28N R3W, MAPLE FOREST		DISTRICT: Gaylord
CITY: MAPLE FOREST		COUNTY: CRAWFORD
CONTACT: Diane Lundin , Senior EHS Representative		ACTIVITY DATE: 10/01/2018
STAFF: Sharon LeBlanc	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: unannounced, scheduled site inspection for FY 2019.sgl		
RESOLVED COMPLAINTS:		

INTRODUCTION

October 1, 2018, AQD District Staff conducted an unannounced, scheduled site inspection of the Linn Operating, Inc. (AKA Linn) State Maple Forest 1-3 CPF (N7575). The referenced facility is located in the SW ¼, NE ¼ of NW ¼ of Section 3, Township 28 N, Range 3W, Maple Forest Township, Crawford County, Michigan.

The referenced facility is considered a synthetic minor opt-out and operates under Permit to Install (PTI) 352-08. The last compliance inspection of record was conducted on June 25, 2015, at the time of the inspection no compliance issues were noted, and the facility was determined in compliance with their permit.

The facility is an unmanned, gated facility. Records required to make a compliance determination for the facility were requested electronically from Linn Staff on September 24, 2018.

FACILITY

The Linn Maple forest Central Production Facility (CPF) was originally permitted by Dominion Exploration & Production (Permit to Install 26-06. The function of the Facility at the time of permitting was removal of water from the gas stream using a small glycol dehydrator and increase pressure of the Natural Gas (NG) in the line for transport. In 2008, the Facility was of record as being operated by High Mount Exploration & Production, LLC. District files contain a copy of a April 20, 2017, Entity name change request from Linn Operating Inc to Linn Operating LLC, effective March 1, 2017.

The Facility is located on the east side of North Sherman Road, ¼-mile south of the intersection of North Sherman Road and West Krause Road. One route to the Facility is to travel east on County Road 612, from the Frederick, Michigan exit on I-75, then north on Sherman Road approximately 4.5 miles. Note that if you reach Krause road, you have just missed the Facility entrance. The facility access is from the east side of North Sherman Road. Krause Road marks the Otsego County Line.

At the time of the inspection, it was mostly cloudy, with temps of 47 degrees Fahrenheit. The green safety light was visible for building entry. Heat waves could be seen coming from both compressors onsite. No odors were detectable.

Adjacent properties appeared to consist predominantly of privately-owned wooded parcels with and without residences. The Facility as well as the adjacent parcels are bounded by Au Sable State Forest.

PERMITTING

Permits of record for the Facility include the following:

Permit No.	Approval Date	Void Date	Associated Equipment
26-06	April 13, 2006	Feb. 27, 2007	EUENGINE1 and FG FACILITY
352-08	December 30, 2008	NA	EUDEHY, EUENGINE1 and EUENGINE2 (FG ENGINES), and FG FACILITY

At the time of the 2006 permitting, the Facility was reported to be an existing facility constructed on May 27, 1991. In addition to the equipment identified above, a small glycol dehydration unit as well as a 106 HP Waukesha F817GU booster engine. The Facility was reported to be a true minor Hazardous Air Pollutant (HAP) source.

At the time of the 2008 permitting, two NG-fired internal combustion engines (ICE) were reported present onsite. The engines were reported as not subject to Subpart JJJJ due to a manufacture date before July 1, 2007. The Facility at the time of permitting requested criteria pollutant emission limits for FGEngines, despite emissions for FGFACILITY of <100 ton per year.

REGULATORY

The referenced facility does not process or store petroleum liquids 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);

40 CFR Part 60 Subpart OOOO (Standards of Performance for Crude Oil and NG Production, Transmission and Distribution) and Subpart OOOOa would apply to onshore affected facilities that are constructed, modified or reconstructed after August 23, 2011 and September 18, 2015, respectively. 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. No compliance determination has been made with reference to the subparts.

40 CFR Part 60 (NSPS) Subpart JJJJ for Spark Ignition (SI) Reciprocating Internal Combustion Engines (RICE), respectively. At the time of the 2008 permitting, the engineer evaluation reported that the existing RICE were not subject to the referenced subpart based on manufacture dates before July 1, 2007. No compliance determination has been made with reference to the subpart.

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

- Subpart HH (HAPS from Oil and NG Production Facilities)
- Subpart ZZZZ (Reciprocating Internal Combustion Engine aka RICE)
- Subpart JJJJJJ (Industrial, Commercial and Institutional Boilers and Process Heaters)

With respect to Subpart HH, Gosling correspondence dated November 9, 2016, the contractor reports that the Clear Lake State Maple Forest Facility has an actual annual NG flow rate of less than 3 million standard cubic feet per day (MMcf/d) or 85,000 cubic meters/day and actual annual benzene emission rates of < 1.0 ton/year making the unit exempt from emission control requirements under 40 CFR Part 63 Subpart HH for minor sources of HAPs. Confirmation of this status was provided by the Facility in electronic correspondence dated October 25, 2018. Dry gas flow rates of 3.69 MMSCF/day were reported, which exceeds the 3 MMSCF/day threshold. Actual benzene (C8 compound) emission rates (determined by GRI-GLYCalc Version 4.0) were calculated to be less than 0.0010 ton/year, with total hydrocarbon emissions of 0.9865 tons/year. A compliance determination has not been made with respect to this subpart, and at the time of report preparation AQD does not have authority to enforce the subpart.

With respect to Subpart ZZZZ (RICE MACT), the facility engines are subject to the referenced subpart. However, at the time of the site visit, AQD has not been delegated authority for subpart ZZZZ and no compliance determination with reference to the subpart has been made.

NESHAP subparts JJJJJJ pertain to Industrial, Commercial and Institutional Boilers and Process Heaters for Area source of HAPS, respectively. At the time of the site inspection, it appears that the reboiler of the glycol dehydration process would not be subject to the subpart, as a process heater is

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not subject for area sources. No compliance determination has been made with reference to the subpart.

EQUIPMENT

A review of District files indicated that the dehydration system consists of a Kimray 40-15 (40-gallon/hour capacity) pump, a pump separator (vapor recovery), a drip collector (condenser) and a dehydrator regenerative heater with a 125,000 BTU/Hour rating.

In addition to the glycol dehydration system, the Facility is permitted for two compressor engines, which at the time of the 2008 permitting consisted of two CAT 3516LE. Documented engines associated with the site include the following:

Emission Unit	Make/Model S/N	Installation Date	Removal Date	Information Source
EUENGINE1	Ajax 800 Low Emission (LE) 400 RPM 800 HP	Pre- January 2006	December 18, 2006	October 13, 2006 Notification
EUENGINE1 CM3032	CAT 3516 LE 1200 RPM 1085 HP Turbo-Aspirated Lean Burn No Controls	5/15/2008*	NA	October 13, 2006 Notification
Booster	Waukesha F817GU 106 HP	Pre- January 2006	December 18, 2006	October 13, 2006 Notification
EUENGINE2 CM3041	CAT 3516 LE 1200 RPM 1085 HP Turbo-Aspirated Lean Burn No Controls	5/15/2008*	NA**	MAERS

* Date of Installation reflects dates reported in MAERS database by Facility. Though EUENGINE1 was reported to be onsite prior to February 2007 (southern compressor building, present in 2005 aerials), as it was installed to replace both the Ajax and Waukesha engines previously associated with the site. This is also indicated by a review of aerial photos for the site which document a northern extension to the compressor building, to house EUENGINE2.

** ArchRock maintenance logs indicate EUENGINE2 was replaced with the same make and model CAT on May 18, 2016.

At the time of the October 1, 2018, site inspection the following information was collected from operators logs and equipment gauges.

Emission Unit	Onsite Designation	RPMs	Compressor Oil Temp
EUENGINE1	Unit 4087	1021	184
EUENGINE2	Unit 4254	1017	192

Review of Compressor data provided by Linn Staff for the two compressor engines indicated that the engines are operated at fairly consistent rates.

Date	RPMs EUENGINE1	RPMs EUENGINE2
1/17/2016	1013	1035
5/14/2016	1032	1034

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9/8/2016	1025	1034
4/15/2017	1013	1005
8/30/2017	1029	1027
5/16/2018	1033	1033
9/23/2018	1014	1013

Maintenance records supplied by the Facility for the referenced engines indicated that the two engines are serviced quarterly at minimum. Separate reports are submitted by ArchRock the contracted engine maintenance service for either "Maple Forest #1, CM3032" and "Maple Forest #2 CM3041". An Engine swing for EUENGINE2 also appears to have occurred on May 18, 2016.

COMPLIANCE

Since the June 25, 2015 site inspection there have been no complaints, violation notices or consent orders or other compliance issues identified for the Facility. Annual emissions are reported by Linn for the Facility as part of the MAERS reporting system. Annual submittals are received in a timely manner.

Compliance status for the facility had been based on information obtained during the October 1, 2018, site inspection, as well as on supplemental data and reports submitted upon request or to meet permit requirements identified under PTI 352-08.

EUDHY- As previously indicated the facility has a Triethylene Glycol (TEG) dehydration system for processing of NG from the Antrim Zone. Permit conditions associated with EUDHY are limited to the following.

OPERATION LIMITS - Operations restrictions for EUDHY are limited to a high-level citation of requiring compliance with all provisions of NESHAP 40 CFR Part 63, Subpart HH, as they apply to EUDHY upon startup. (SC III.1)

MONITORING/RECORDKEEPING – Monitoring and recordkeeping requirements for EUDHY includes documentation of the following parameters to determine if the unit meets exemption criteria under Subpart HH:

- Actual annual average flow rate of natural gas to EUDHY and is to be measured with an instrument with an accuracy of plus or minus 2 percent or better. (SC VI.1(a))

Information provided by the Facility indicate that a "HIP" gas meter and remote terminal controller are used to monitor natural gas flow rates. The "HIP" manufacturer data reports an accuracy of +/- 0.1% accuracy, the Facility reports that the accuracy is +/- 25%, both are well under the 2% required.

- Actual average benzene emissions using the model GRI-GLYCalc™ version 3.0 or higher and procedures in the associated technical reference manual. (SC VI.1(c))
- Average mass rate of benzene emissions in kilograms/hr. (SC VI.1(d))
- Annual benzene emissions determined by multiplying the average mass rate of benzene with the total number of days operated per year. (SC VI.1(d))

GRI-GLYCalc data provided by the Facility indicates that they used Version 4.0 to calculate emissions. The flow rate was reported to be 0.1 gallon per minute and water content of 1.5wt % H₂O. Dry gas flow rates of 3.7 MMSCF/day for 2017. Based on the information provided by Linn Staff, it appears that all of the above calculations have been completed in compliance with the permit conditions.

To meet exemption criteria, the Facility is required to document the actual annual average NG flow rate to EUDHY of 85,000 cubic meter/day (SC VI.1(b) and VI.2) or actual average benzene emissions less than 0.90 megagrams per year (< 1.0 ton/year) (SC VI.1(b) or VI.3). As noted previously, GRI-GLYCalc Version 4.0 reports for 2017 indicate that the total benzene concentration (C8 + heavies) exemption was met.

REPORTING -Reporting requirements are limited to all applicable notifications and reports required and by the dates required under subpart HH. (SC VII.1)

FGENGINES- The referenced FG includes both EUENGINE1 and EUENGINE2 (CAT 3516LE), NG-fired RICE neither of which have associated pollution control devices. No material limits are associated with FGENGINES. In addition, as neither engine is equipped with an add-on control device the following special conditions are not applicable:

- Operational limit of 200 hours per year for engine without it's control device. (SC III.2)
- Proper installation, operation and maintenance of the add-on control device (SC IV.1)
- Documentation of the hours of engine operation without it's control device (SC VI.3)

OPERATION LIMITS – No later than 60 days after the issuance of Permit 352-08 the permittee was required to submit for review and approval a Preventative Maintenance/Malfunction Abatement Plan (PM/MAP). Records indicate that the required document was submitted in a timely manner in compliance with the permit condition. (SC III.1) Documents contained in District files are summarized below:

PM/MAP Submittal Date	Approval Date	Engines included
May 4, 2006	July 5, 2006	Ajax 800 LE and Waukesha F817GU
January 30, 2009	May 7, 2010	(2) CAT 3516 LE

In addition to the PM/MAP requirements above, the permittee is limited to operation of any engine equipped with an add-on control device for more than 200 hours. (SC III.2) As previously noted, neither engine is equipped with a control device, therefore the permit condition is not applicable.

EMISSION LIMITS Emission limits associated with the permit 352-08 are limited to NOx and CO limits summarized below. A review of emission calculations completed monthly are summarized below, and indicate that FGENGINES are below permit limits.

Emission Unit	NOx Emissions (TPY)	CO Emissions (TPY)	Reporting Period
EUENGINE1	14.33	12.89	2016
EUENGINE1	14.55	13.10	2017
EUENGINE1	14.52	13.07	Sept 2017 – August 2018
EUENGINE2	14.10	12.69	2016
EUENGINE2	14.24	12.82	2017
EUENGINE2	14.06	12.65	Sept 2017 – August 2018
LIMIT	23.11 (SC I.1 & SC I.3)	20.9 (SC I.2 & SC I.4)	12-month rolling

TESTING ACTIVITIES – Under the present permit verification of NOx and CO emissions are required upon request of the AQD District Supervisor. (SC V.1) District files contain no copies of written requests for verification testing, and the permit condition not applicable at the time of report preparation.

MONITORING/RECORDKEEPING –Permit requirements for monitoring and recordkeeping include the following:

- Completion of all required calculations by the last day of the calendar month for the month prior and made available to AQD staff upon request, unless other wise specified in any special condition (SC.VI.1)
- Monthly and 12-month rolling time period NOx and CO emission calculation records for each engine in FGENGINES as required by SC I.1 and Appendix A. (SC VI.4 and VI.5) and

A review of data provided by Linn staff for the Facility indicated that the required calculations are being kept. Linn staff report that the calculations are completed at approximately the middle of each month.

- Maintain a log of all maintenance activities conducted according to the PM/MAP (SC VI.2)

As previously indicated, copies of maintenance reports conducted by Arch Rock on the two engines in the FG were provided by Linn Staff. A review of the documents indicated that the records appear to meet permit requirements. The maintenance activities are completed on a maintenance schedule which includes oil/oil filter changes, spark plug replacements, coolant flushes, gasket replacements and oil sampling activities at minimum of a quarterly basis.

REPORTING – Reporting requirements include SC VII.1 which requires notification (except as provided in Rule 285 and within 30-days) if any engine under FG ENGINES is replaced with an equivalent or lower emitting engine. Based on the May 18, 2016, ArchRock maintenance report, the CAT 3516 TA referred to as Maple Forest 2 (AKA EUENGINE2) was replaced with the same make and model.

Communications with Linn Staff in August 2018 regarding the engine swings at another Linn Facility indicate that their understanding of the above referenced permit condition did not include what the Facility terms as engine swings, the replacement of an existing engine with the same make and model engine. This interpretation of the permit condition was reported to be the result of discussions with a previous AQD District supervisor. More recent communications with Linn Staff has indicated that they are willing to notify for future engine swings.

STACK/VENT - Permit 352-08 (SC VIII.1) limits the exhaust dimensions for the stack associated with EUENGINE1 to a maximum exhaust diameter of 12-inches and minimum height of 22-ft above land surface. Stack restrictions for EUENGINE2 include a maximum exhaust diameter of 12-inches and minimum height of 25 ft above land surface (SC VIII.2). Information provided by Linn Staff indicates that both stacks were constructed as 12-inch diameter, and the minimum stack heights.

OTHER REQUIREMENTS- No other requirements exist for FG ENGINES.

FG FACILITY – This FG includes all process equipment source-wide including equipment covered by other permits, grandfathered equipment and exempt equipment. Only a limited number of restrictions exist for FG FACILITY and include the following:

- No sour gas (>1 grain of hydrogen sulfide or > 10 grains of total sulfur per 100 standard cubic feet) shall be burned on site (SC II.1)
- Verification of H₂S and or sulfur content upon request to ensure compliance with SC II.1(SCV.1) and
- Complete all required calculations and make them available by the last day of the calendar month, for the previous calendar month unless otherwise specified in any permit SC.

January 15, 2018, Laboratory analyticals were provided for the incoming gas stream. The referenced analytical report indicated that hydrogen sulfide concentrations were below detection levels of one part per million and in compliance with the above permit conditions.

SUMMARY

October 1, 2018, AQD District Staff conducted an unannounced, scheduled site inspection of the Linn Operating, Inc. (AKA Linn) State Maple Forest 1-3 CPF (N7575). The referenced facility is located in the SW ¼, NE ¼ of NW ¼ of Section 3, Township 28 N, Range 3W, Maple Forest Township, Crawford County, Michigan. The facility is an unmanned, gated facility. Records required to make a compliance determination for the facility were requested electronically from Linn Staff on September 24, 2018. Data requested was received electronically on October 25, 2018.

The referenced facility is considered a synthetic minor opt-out and operates under Permit to Install (PTI) 352-08. The last compliance inspection of record was conducted on June 25, 2015, at the time of the inspection no compliance issues were noted, and the facility was determined in compliance with their permit.

Based on observations and documentation associated with the October 1, 2018 site inspection and subsequent data review, it appears that with the exception of an unreported engine swing in 2016. No compliance issues are associated with the Facility with respect to Permit 352-08. Discussions with Linn Staff have resulted in the facility indicating that they will notify for future engine swings.

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DATE 10/29/18

SUPERVISOR SN