DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection

P131868357

FACILITY: LAYLINE OIL & GAS LLC		**SRN / ID:** P1318
LOCATION: Section 12 T20N R06W, LEOTA		**DISTRICT:** Bay City
CITY: LEOTA		**COUNTY:** CLARE
CONTACT: Raymond Brodeur , Reservoir Engineer		**ACTIVITY DATE:** 07/27/2023
STAFF: Nathanael Gentle	**COMPLIANCE STATUS:** Non Compliance	**SOURCE CLASS:** Synthetic Minor
SUBJECT: Self initiated on-site inspection in response to citizen complaints		
RESOLVED COMPLAINTS: C-23-01634		

On July 27, 2023, AQD staff conducted a self-initiated onsite inspection at Layline Oil and Gas – Cranberry Lake Facility, SRN P1318. The purpose of the inspection was to determine compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; Michigan Department of Environment Great Lakes and Energy, Air Quality Division (AQD); to determine compliance with the facility's Permit to Install (PTI), PTI No. 4-23, and to investigate recent complaints received regarding odors, attributed to Layline Oil and Gas – Cranberry Lake operations. AQD staff were accompanied by Mr. Coty Withorn with EGLE's Oil Gas and Minerals Division (OGMD). EGLE staff were assisted onsite by Mr. Kyle Tomich. Records were provided by Mr. Ray Brodeur. At the time of inspection, the facility was found to be in non-compliance.

Facility Description and History

The Layline Oil and Gas – Cranberry Lake Facility, SRN P1318, is located in the northwest ¼ of the northeast ¼ of Section 12, T20N, R06W, Winterfield Township, Clare County, Michigan. The facility is located south of Pierce Rd between Bear Ave and N Hemlock Ave. GPS coordinates for the facility are 44.144126, 84.976053. The Layline Oil and Gas – Cranberry Lake Facility is a central processing facility (CPF) equipped with a gas sweetening plant. Layline Oil and Gas also owns and operates a second permitted CPF, The Layline Oil and Gas State A2 Facility P1075, located 0.5 miles west of the Cranberry Lake Facility.

The Layline Oil and Gas – Cranberry Lake Facility is a synthetic minor source of oxides of sulfur (SO_x). One Permit to Install (PTI) is associated with the facility, PTI No. 4-23. PTI No. 4-23 was issued on January 19, 2023. AQD staff first began receiving citizen complaints regarding the Layline Oil and Gas Cranberry Lake facility on July 10, 2023. The complainant detailed they were experiencing strong odors at their residence. The odors were described as a gas and sulfur smell.

Wells feeding into the facility produce oil, brine, and natural gas. Natural gas is either "sweet" or "sour" natural gas. The AQD defines sour gas as any gas containing more than 1 grain of hydrogen sulfide (approximately 16 ppm of hydrogen sulfide (H_2S)), or more than 10 grains of total sulfur per 100 standard cubic feet. One of two heater treaters onsite are used to separate the incoming material into its three components. Oil is sent to one of three 400-barrel onsite oil storage tanks. The brine is sent to an onsite brine storage tank. The natural gas is sent to the onsite gas sweetening plant for further processing. In addition to gas from wells, natural gas from the nearby State A2 CPF is sent to the gas sweetening plant at the Cranberry Lake facility.

Natural gas is passed through an amine plant which separates the H_2S from the natural gas. The separated H_2S is then passed through a water tower to pull salt out. From there, an electric compressor will be used to reinject the H_2S into the ground. Natural gas exiting the amine plant will be sent to an iron sponge to further remove any remaining H_2S. From there, the natural gas is passed through a desiccant dehydrator to remove moisture. The natural gas is then passed through a Joule Thomson (JT) skid to separate natural gas liquids (NGLs) from the natural gas. The NGLs are sent to an onsite bullet tank where they are stored until they are trucked out from the facility. The natural gas will be sold and sent to a commercial natural gas pipeline.

At the time of inspection, facility staff reported contract negotiations had halted the sale of the sweetened natural gas. As a result, all sweetened natural gas was being flared at the facility. In addition, Layline staff reported the facility had experienced numerous mechanical complications with the recently purchased electronic compressor which is to be used to reinject the H_2S removed by the amine plant. Staff report the compressor had only operated for a few days at a time before another component of the equipment didn't work. At the time of inspection, the electronic compressor was awaiting a part for repair and was not operational. While the compressor is not operational, the H_2S is sent to the flare for combustion which converts the H_2S to Sulfur Dioxide (SO_2).

Compliance Evaluation

Odor Evaluation

Prior to arriving to the facility, EGLE staff evaluated the permitter of the Cranberry Lake and State A2 facilities for odors. No offsite odors were detected. Staff then proceeded to the State A2 facility. Minor gas odors were detected onsite at the State A2 facility when standing between the tank battery and the flare. Staff then proceeded to the Cranberry Lake facility. During the onsite inspection at the Cranberry Lake facility, onsite odors were not detected.

EUSWEETENING

EUSWEETENING encompasses the gas sweetening process and its associated equipment. Special Condition (S.C.) III.1. of PTI No. 4-23 requires a preventative maintenance / malfunction abatement plan (PM/MAP) be compiled for EUSWEETENING. A copy of the PM/MAP was to be submitted to the AQD District Supervisor no later than 60 days after issuance of the PTI. A copy of the facility's PM/MAP was submitted to the AQD on March 13, 2023, within 60 days of permit issuance.

The Cranberry Lake facility is equipped with a series of H_2S sensors throughout the facility. As part of the onsite inspection, a copy of the facility's H_2S Monitoring Plan was requested and reviewed, S.C.III.2. A copy of the plan was provided on August 7, 2023. Special Condition III.2. stipulates a copy of the plan was to be provided to the AQD no later than 60 days after issuance of the permit. Sixty days after issuance of the permit was March 20, 2023. The copy of the plan provided on August 7, 2023, was the first copy provided to the AQD. Layline staff were made aware that the H_2S Monitoring Plan was not submitted in the timeline required by the facility's permit. The H_2S monitoring plan provided included all information required by S.C.III.2. Included in the plan was a diagram showing the location of all monitors at EUSWEETENING. Monitors used

are Calibration Technologies Inc. model #CG-H2S-50-EXP gas sensors. The monitors use electrochemical sensors capable of sensing H_2S in concentrations of 0-50 ppm. The sensors are housed in explosion-proof enclosures and operate continuously. The monitors will alarm when any concentration in excess of 25 ppm H_2S is detected within the plant area. If H_2S is detected at a concentration of 50 ppm, wells feeding into the facility are automatically shut in at the well heads. Additionally, an H_2S analyzer is in place to analyze the H_2S concentration of gas leaving the sweetening plant. Any gas deemed unmarketable is automatically sent to the flare and Layline personnel are notified.

During the onsite inspection, the H_2S monitors were observed to be installed at the facility. Sensors were observed to be in place near equipment, and around the sweetening plant perimeter. Staff report the monitors are tested once a month to ensure proper operation. In the event H_2S concentrations are detected at levels which trigger an alarm, the system will automatically send a callout to Layline staff.

The Cranberry Lake CPF is equipped with a flare. Staff report all emergency relief valves are vented to the flare, S.C.III.4. The flare is equipped with a continuously burning pilot flame, S.C.IV.1. The fuel source of the pilot is reported to be fuel gas. The flare is equipped with a thermocouple to detect the presence of a pilot flame, S.C.IV.2. In the event the pilot flame was to go out, an auto ignitor will automatically relight the pilot. The auto ignitor will attempt to relight the pilot 3 times. If after 3 relight attempts, the pilot is still not relit, the facility is automatically shut in, S.C.III.6. The system will send a call out to Layline staff if the pilot goes out. Staff report the automatic shut-in system is tested once a month to ensure proper operation.

Special Condition V.1. requires the permittee to determine the representative H_2S concentration in the treated gas exiting EUSWEETENING at least once per calendar month. At the time of inspection, staff reported they were currently using colorimetric detector tubes to determine the H_2S concentration of gas exiting EUSWEETENING. Staff report concentrations were being measured on a daily basis. Additionally, staff report the system is equipped with an electronic chromatograph which will be used to continuously monitor the H_2S concentration of treated gas exiting EUSWEETENING once the gas is sent to a commercial natural gas pipeline for sales.

At the time of inspection, the electronic compressor used to push separated acid gas into the reinjection well was not operational. Staff report since the compressor was put in at the facility, it has only operated for a few days at a time before another component of the equipment ceased to work. Special Condition VI.3. stipulates that upon completion of the installation of the acid gas injection (AGI) system, the permittee shall record the time, and duration of each incidence of emergency flaring of sour gas. The permittee shall calculate the amount of SO_2 emitted from the incidence. Additionally, upon completion of installation of the AGI system, the permittee shall maintain records of malfunctions and abnormal conditions. The records shall include the date, time, the cause of the malfunction or abnormal condition, and the corrective action taken and/or operational changes made to prevent a reoccurrence, S.C.VI.4. AQD staff reminded Layline staff of these permit conditions and record keeping requirements associated with the AGI system.

Signs warning of the poison gas danger were observed to be posted on the property to warn and deter unauthorized individuals from entering the plant property, S.C.IX.

FGPRODUCTION

FGRPODUCTION encompasses all oil and gas production equipment at the facility. Equipment listed in PTI No. 4-23 includes, EUSWEETENING, EUHEATER1, a 0.5 MMBTU/hr natural gas fired heater treater, EUHEATER2, a 0.4 MMBTU/hr natural gas fired heater treater, EUHEATER3, a 0.5 MMBTUhr natural gas fired tank heater, EUHEATER4, a 0.5 MMBTU/hr natural gas fired amine plant reboiler, EUTANKS, three 400-barrel oil tanks, and EUDEHY, a desiccant dehydrator used to remove water from natural gas.

The storage tank battery and load out were visually verified to be plumbed so that gas emissions are sent to the flare, S.C.III.1. AQD staff inquired as to whether facility personnel perform leak checks on the equipment. Staff reported they would be able to smell if a leak were occurring. Additionally, H_2S monitors are placed throughout the facility to help detect if a leak is present. At the time of inspection, H_2S gas separated in the gas sweetening plant was being flared. The facility plans to reinject the H_2S into geologic formations for disposal. Injection of the sour gas will commence once the facility's electric compressor is repaired and operational.

The permittee shall monitor and record the volumetric flow rate of sour gas going to the flare per day, per calendar month, and per 12-month rolling time period, S.C.VI.1. Records detailing the volumetric flow rate of sour gas going to the flare were requested and provided for the period of February 2023 to July 2023. During the period of records reviewed, gas from three different sour wells were being flared at the facility. These wells include, the State A2, MMB 11-12, and Tope 4. Sour gas volumes sent to the flare are tracked based on gas volumes from each of the individual wells.

During the period of records reviewed, the highest daily gas flow rates from each well were as follows. The highest daily gas flow rate from the Tope 4 well was 46 MCF/day on 4/13/2023. The highest daily gas flow rate from the State A2 well was 307 MCF/day on 5/21/2023. The highest daily gas flow rate from the MMB 11-12 well was 529 MCF/day on 7/28/2023.

Daily gas flow volumes are summed to calculate the monthly gas flow volumes from each of the wells. During the period of records reviewed, the highest monthly gas volumes from each well were as follows. The highest monthly gas volume from the Tope 4 well occurred in April 2023 with 1119 MCF. The highest monthly gas volume from the State A2 well occurred in July 2023 with 1791 MCF. The highest monthly gas volume from the MMB 11-12 well occurred in June 2023 with 5216 MCF.

Monthly gas flow volumes from each well are summed together to calculate the total gas volume flared each month. During the period of records reviewed, the highest volume of gas flared in one month was 7018 MCF/month in June 2023. Monthly gas volumes are used to calculate the 12-month rolling volume of sour gas flared. During the period of records reviewed the highest 12-month rolling volume of gas flared occurred at the end of July 2023 with 19515 MCF/Year, below the permitted limit of 54.58 MMcf/yr, S.C.II.3.

Records of the monthly readings of the concentration of hydrogen sulfide in the sour gas sent to the FGPRODUCTION flare were requested. Records provided showed the facility measures the H_2S concentration of gas from each individual well entering the facility. Additionally, staff report the H_2S concentration is measured at the outlet of the gas sweetening plant to determine the H_2S concentration in the sweetened natural gas. In the records provided, the H_2S concentration of gas from each individual well entering the facility was being measured on a quarterly basis. Special

Condition VI.1. stipulates the readings of the concentration of hydrogen sulfide in the sour gas sent to the FGPRODUCTION flare shall be recorded monthly. The permittee shall perform 6 consecutive monthly readings of the concentration of hydrogen sulfide in the sour gas. After completion of the 6 consecutive monthly readings, the permittee may request an alternative monitoring schedule, S.C.VI.6. At the time of inspection, 6 consecutive monthly readings had not been completed and an alternative monitoring schedule had not been requested. Monitoring of the H_2S concentration in the sour gas sent to the flare on a quarterly basis is a violation of S.C.VI.1. Facility staff were made aware of this violation. The violation was cited in a violation notice (VN) sent to the facility on August 22, 2023.

Gas flow rates and H_2S concentrations from each individual well are used to calculate the amount of H_2S sent to the flare. During periods when acid gas is reinjected and only sweetened gas is flared, the H_2S concentration measured at the outlet of the gas sweetening plant is used to calculate the amount of H_2S sent to the flare. Records of monthly and 12-month rolling calculations of the mass flow rate of H_2S that went to the flare for the period of February 2023 through July 2023 were requested and reviewed, S.C.VI.2. The amount of H_2S sent to the flare from each well is calculated and summed to determine the total daily volumes of H2S sent to the flare. During the period of records reviewed, the highest amount of H_2S sent to the flare in one day was 1144.8 lbs/day on 5/21/2023.

The monthly amounts of H_2S sent to the flare are tabulated and tracked. During the period of records reviewed, the lowest monthly amount of H_2S sent to the flare was 995.6 lbs/month in February 2023. The highest monthly amount of H_2S sent to the flare occurred in July 2023 with 6235.0 lbs/month, below the permitted limit of 6,333lbs/month, S.C.II.2. Layline staff closely monitor H_2S volumes sent to the flare to ensure the facility does not exceed the permitted monthly limit. Included in the emission calculations spreadsheet provided was a column continuously calculating the remaining H_2S that can be sent to the flare each month before the limit is reached. If the facility is approaching its monthly limit, wells feeding the facility are shut in until the start of a new month.

Monthly amounts of H_2S sent to the flare are used to tabulate the 12-month rolling amount of H_2S sent to the flare. During the period of records reviewed, the highest 12-month rolling value was 9.84 tons/yr at end of July 2023, below the permitted limit of 38.0 tpy, S.C.II.1.

Using gas flow volumes and H_2S concentrations from each well, the facility calculates the SO_2 emissions. Records of monthly and 12-month rolling SO_2 emissions were requested and reviewed for the period of February 2023 through July 2023, S.C.VI.3. Calculations of SO_2 emissions assume the flare has a H_2S destruction efficiency of 95%. During the period of records reviewed, the lowest monthly SO_2 emissions occurred in February 2023 with 1780.4 lbs/month. The highest monthly SO_2 emissions occurred in July 2023 with 11154.5 lbs/month. Twelve month rolling emissions of SO_2 are tabulated and tracked. During the period of records reviewed, the highest 12 -month rolling SO_2 emissions occurred at the end of July 2023 with 17.59 tpy, below the permitted limit of 68 tpy, S.C.I.1.

Special Condition IX.1. stipulates the permittee shall comply with all provisions of the federal Standards of Performance for New Stationary Sources as specified in 40 CFR Part 60 Subparts A and OOOOa, as they apply to FGPRODUCTION. Time was not taken during this inspection to review subjectivity and compliance of the facility with the regulation. Layline staff were reminded

of their potential subjectivity to the regulation and encouraged to review the regulation and ensure facility compliance with the standard.

As part of the records review completed, AQD staff reviewed the H_2S concentrations and daily gas flow rates from individual wells fed into the Cranberry Lake Facility. Upon review, AQD staff observed that the H_2S concentrations of gas from individual wells being flared at Cranberry Lake are higher than what was provided in the facility's Permit to Install application. In addition to the increased H_2S concentrations, maximum daily gas flow rates achievable from individual wells are higher than what was indicated in the facility's PTI application.

The facility's PTI application indicated the Tope Harry 4 well had a H_2S concentration of 10,700 ppm and a daily gas flow rate of 38 mcf/day. During the period of records reviewed, the H_2S concentration of gas from Tope Harry 4 ranged from 8,300 to 11,000 ppm. A maximum daily flow rate of 46 mcf/day occurred on April 13, 2023.

The PTI application indicated the MMB Trust 11-12 well had a H_2S concentration of 0 ppm and a daily gas flow rate of 24 mcf/day. During the period of records reviewed, the H_2S concentration of gas from MMB Trust 11-12 ranged from 7,000 to 8,400 ppm. A maximum daily flow rate of 529 mcf/day occurred on July 28, 2023.

The PTI application indicated the State A2 well had a H_2S concentration of 21,000 ppm and a daily gas flow rate of 125 mcf/day. During the period of records reviewed the H_2S concentration of gas from State A2 ranged from 41,000 to 43,000 ppm. A maximum daily flow rate of 307 mcf/day occurred on May 21, 2023.

The H_2S concentrations and gas flow rates observed in facility emission records indicate the Potential to Emit (PTE) of the facility is larger than was what was provided during permitting of the facility. Potential to emit means the maximum capacity of a stationary source to emit an air contaminant under its physical and operational design. The increase in the PTE for the facility is an increase in emissions and therefore triggers a modification pursuant to Rule 201 of the administrative rules promulgated pursuant to Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This violation of Rule 201 was cited in the violation notice (VN) sent to the facility on August 22, 2023.

Summary

On July 27, 2023, AQD staff conducted a self-initiated onsite inspection at Layline Oil and Gas – Cranberry Lake Facility, SRN P1318. The Layline Oil and Gas – Cranberry Lake Facility is a central processing facility (CPF) equipped with a gas sweetening plant. The facility is located south of Pierce Rd between Bear Ave and N Hemlock Ave in Winterfield Township, Clare County, Michigan. GPS coordinates for the facility are 44.144126, 84.976053. The Layline Oil and Gas – Cranberry Lake Facility is a synthetic minor source of oxides of sulfur (SO_x). One Permit to Install (PTI) is associated with the facility, PTI No. 4-23. At the time of inspection, the facility was found to be in non-compliance. Review of facility records provided indicated monitoring of the H_2S concentration in the sour gas sent to the flare is conducted on a quarterly basis, rather than monthly, as required by Special Condition VI.1. of FGPRODUCTION in PTI No 4-23. Additionally, the H_2S concentrations and gas flow rates observed in facility emission records indicate the Potential to Emit (PTE) of the facility is larger than was what was provided during permitting of

the facility. The increase in the PTE for the facility is an increase in emissions and therefore triggers a modification pursuant to Rule 201. A violation notice (VN), detailing the alleged violations was sent to the facility on August 22, 2023.

Nathanael Gentle DATE 9/5/2023 SUPERVISOR Chris Hare

NAME