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

P089856102

FACILITY: Prolime Agricultural, LLC		**SRN / ID:** P0898
LOCATION: 9542 Beard Road, LAINGSBURG		**DISTRICT:** Lansing
CITY: LAINGSBURG		**COUNTY:** SHIAWASSEE
CONTACT: Robert Rogers , CEO		**ACTIVITY DATE:** 11/05/2020
STAFF: Julie Brunner	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MINOR
SUBJECT: Scheduled inspection and stack testing observation		
RESOLVED COMPLAINTS:		

On November 5, 2020, I did a scheduled inspection as part of a stack testing observation at Prolime Agricultural, LLC (Prolime) located at 9542 Beard Road in Laingsburg, Michigan. Notification of installation per PTI 41-18, Special Condition (SC) VII.1 was received on March 3, 2020 indicating the end of trial operation. They had 180-days to complete the required stack testing per PTI 41-18. The test protocol for volatile organic compounds (VOC) testing of the pelletizing process exhaust (FGPELLETIZE) was received on October 2, 2020. The test protocol was approved on October 23, 2020. Testing was scheduled for November 5, 2020 which is outside of the 180-days but it appears that COVID delayed the scheduling of the stack testing.

Arrived: 8:20 am

Departed: 2:20 pm

Weather:

55ºF, Wind 9 mph, UV Index 0

Visible Emissions (VE):

No VEs were identified upon arrival from the plant or roads.

Odors:

No odors were identified surrounding the facility or on-site.

Facility Contacts:

Mr. Robert Rogers, CEO, ProLime, 586-781-7070, email@prolime.net

Mr. Dave Uliveto, Plant Engineer, ProLime, 586-781-7070, email@prolime.net

Stack Tester:

Network Environmental Corp, Mr. Steve Byrd and Matt, testing staff

AQD Staff:

Ms. Julie Brunner, EQS, AQD-Lansing

Mr. Mark Dziadosz, EQA, AQD-Warren, TPU

Last AQD Inspection Date: December 10, 2019

Facility Description:

ProLime Agriculture, LLC (ProLime) was issued a Permit to Install (PTI) No. 41-18 for a new facility to manufacture pelletized soil amendment products for the agricultural industry. PTI No. 41-18 was issued on May 22, 2018.

ProLime is located east of the Rose Lake State Wildlife Research Area. The facility is in a mainly rural area with some residential housing to the southeast, south, and southwest with the I-69 corridor to the south.

The facility is a true minor source of criteria pollutants, and is not a major source of hazardous air pollutants (HAPs).

Commencement of Operations: By September 15, 2019, the majority of the equipment was installed and the process development and shakedown phase started. ProLime staff were hoping to commence trial operation in the Spring of 2020 with final product development, customer approval, and final equipment changes completed.

Facility Capacity: Plant design is for 60,000 tons per year. They hope to achieve 25,000 to 30,000 tons for 2020.

Staff #: 8 (3 – 4 per shift) Shifts/Day: 2 Days of Operation/Week: Monday – Friday

Boilers? Yes

Two (2) natural gas-fired boilers for radiant heated plant floors. Both boilers are exempt from permitting per Rule 282(2)(b)(i).

Emergency Generators? No

Cold Cleaners? No

The process uses pre-pulverized lime or gypsum as a substrate that is coated with a sodium, magnesium, or ammonia-based lignin sulfonate and pelletized for a soil amendment product. The lime is mainly spent lime from a water treatment plant (Lansing BWL) and the synthetic gypsum is likely from Lafarge, based on the Safety Data Sheet (SDS) in the permit file. The lignin sulfonate is the by-product of a papermill in Tennessee and is produced from lignin in the sulfite chemical wood pulping process.

The lime and gypsum are dried before being mixed/coated with the lignin sulfonate. The coated material is dried and granulated into fertilizer-sized moisture dissolvable granules. The pelletized lime product corrects soil pH and the pelletized gypsum product improves the physical structure of the soil.

Lime and gypsum are transported to the facility by truck. Lime has a moisture content of greater than 25% so it is unloaded outside where it is air dried, and then moved to the indoor raw material storage area. Gypsum is unloaded in the indoor raw material storage area.

Using a front end loader, gypsum and lime are moved from the indoor raw material storage to the receiving hopper and then conveyed to a live bottom hopper that discharges to a natural gas-fired raw material dryer (EURAWDRY); the dryer is controlled by baghouse 1 (designed as A on the PTI). The dried material is pneumatically conveyed to either the lime or gypsum silo located outside the building. The silos have bin vent filters.

The pelletizing line feed auger receives lime or gypsum from the appropriate storage silo and transfers the material to the mixing auger. The mixing auger transfers the material (called substrate) to an elevator that transfers the substrate to a large, open, mixing pan where the lignin sulfonate from the mix tank is flow-coated onto the substrate. The substrate, with the lignin added, is transferred to a natural gas-fired dryer (EUPRODDRY) where the material is dried. Dried material is transferred by an elevator to the screen for sizing. Oversized material goes to the chain mill for size reduction and is returned to the mixing auger along with undersized material for additional processing. Properly sized material goes to the drum for possible addition of an organic dust suppressant and then is discharged to an elevator and conveyed to finished product storage. Emissions from the product dryer are controlled by baghouse 2 (designed as B on the PTI).

Pelletized lime or gypsum is unloaded via conveyor to an interior storage pile. The product is loaded into trucks in the building for shipment. Loading emissions are controlled by the dust suppressant and by minimizing drop height.

Emission Units on PTI 41-18:

EUPELLETIZING	**Pelletizing line consisting of raw material handling, a lime silo controlled by a bin vent filter, a gypsum silo controlled by a bin vent filter, pelletizing raw material using lignin sulfonate, product sizing, and product handling.**	**Installed – lime silo and gypsum silo located outside and silos inside for recycle material. All have bin vents.**

EURAWDRY	18 MMBtu/hr natural gas-fired raw material dryer equipped with a baghouse dust collector.	Installed - Vented to baghouse 1 (A)
EUPRODDRY	16 MMBtu/hr natural gas-fired pelletized product dryer equipped with a baghouse dust collector.	Installed - Vented to baghouse 2 (B)
EUSTORAGETANK1	Storage tank for ammonium, magnesium, or sodium lignin sulfonate; lignin sulfonate is received by tanker truck into this tank.	Installed
EUMIXTANK1	Lignin sulfonate mixing tank #1; lignin sulfonate and water are mixed to produce the desired coating material.	Installed
EUMIXTANK2	Lignin sulfonate mixing tank #2; lignin sulfonate and water are mixed to produce the desired coating material.	Installed
EULOADOUT	Loading trucks with finished product.	Installed
EUROADS	Unpaved roads and parking areas.	built
EUSTORAGEPILES	Outdoor material storage piles.	yes

Flexible Groups on PTI 41-18:

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FGPELLETIZE	Pelletizing operation for producing soil amendment products. Emissions are controlled by bin vent filters, dust collectors, and enclosed transfer points.	EUPELLETIZING, EURAWDRY, EUPRODDRY, EUSTORAGETANK1, EUMIXTANK1, EUMIXTANK2
FGFUGITIVES	Fugitive emission sources including outdoor material storage piles, product loadout, roads and parking areas. Emissions are controlled by use of dust suppressant and vehicle speed limits.	EULOADOUT, EUROADS, EUSTORAGPILES

Stack Testing:

Emissions from FGPELLETIZE were to be sampled under maximum routine operating conditions and during each test run the following information recorded:

- **Pelletizer product throughput (hourly)**
- **Natural gas usage rate (hourly)**

Pelletized Product Throughput Limit (SC II.2): 105,000 tpy

Operating Limit (SC III.2): 4,000 hrs/12-months rolling

Max Hourly Calculation: 105,000 tpy / 4,000 hr/yr = ~26 ton/hr

VOC measured according to USEPA reference methods 1, 2, 3A, 4, 18, and 25A via three (3), 60-minute runs. All VOC measurements are adjusted for analyzer drift using equation 7E-5 in USEPA Method 7E. The analyzers calibrated with protocol 1 gases of the appropriate concentration. The span of the analyzer will be selected so that the concentration of the sample is within the calibrated range of the analyzer. The calibration error, response time, and analyzer drift will be determined and reported. If a dilution system is used to generate calibration gases, then the report will contain the record of the annual calibration and the field evaluation of the equipment. After a test has begun it shall continue and be completed within a 36-hour period.

When I arrived, the stack testers were set up and calibrating equipment. I checked with the facility operations and made sure that they were set up to record the operating data as required by the test approval letter.

For production, the ½ pitch auger was set to 17 revolutions per minute. According to the plant engineer and operator, going any higher could result in plugging of the process equipment. According to production logs, the highest production is about 10 tons/hr and it was noted during the test that they were running 10.2 tons/hr. Recording of natural gas usage was done by taking hourly readings from the facility meter. Consumers Energy will probably have to be contacted to provide estimates of the natural gas usage. With each test run, a bag sample of the exhaust gas was taken. It was sent to the lab for a methane analysis. Methane is not a VOC and the gas analysis is needed in order to subtract it out for the final VOC testing results.

Run #1 was from 9:52 am to 10:52 am. There were puffs of what was initially thought to be smoke observed from the stack. A check of the pressure gauges on the baghouses showed that Baghouse 1 was at 4.5" and Baghouse 2 was at 6". Both were operating within normal ranges. Upon further observation, it was concluded that it was steam. It was a fairly warm day for November, and the steam puffs were very hard to observe and intermittent in nature.

Preliminary Results (from Mark) –

Run #1 – VOC & methane: 84.5 ppm, 22 pph

Exhaust Gas Flow = 37,924 scfm

Exhaust Gas Temperature = 160 degrees F

Run #2 was from 11:27 am to 12:27 pm.

Preliminary Results (from Mark) –

Run #2 – VOC & methane: 21 pph

Exhaust Gas Flow = 37,801 scfm

Exhaust Gas Temperature = 170 degrees F

Run #3 was from 12:55 pm to 1:55 pm. I did not get preliminary results for Run #3. The VOC emission limit is 13.7 pph. The methane content of the gas is estimated to be around 55%. The lab analysis is needed to calculate the final results but once the methane is subtracted out, they are projected to be below the VOC emission limit.

PTI 41-18

FGPELLETIZE

Emission Limits –

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Testing / Monitoring Method
1. PM	0.01 gr/dscf	Hourly	EURAWDRY	SC V.2, VI.2, VI.3
2. PM10	2.13 pph	Hourly	EURAWDRY	SC V.2, VI.2
3. PM2.5	2.13 pph	Hourly	EURAWDRY	SC V.2, VI.2
4. PM	0.01 gr/dscf	Hourly	EUPRODDRY	SC V.2, VI.2, VI.3
5. PM10	2.06 pph	Hourly	EUPRODDRY	SC V.2, VI.2

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Testing / Monitoring Method
6. PM2.5	2.06 pph	Hourly	EUPRODDRY	SC V.2, VI.2
7. VOC	13.7 pph	Hourly	EUPRODDRY	SC V.1
8. Visible Emissions	5% opacity	6-minute average	each exhaust stack in FGPELLETIZE	SC VI.3

Material Limits –

Material	Limit	Time Period / Operating Scenario	Equipment	Testing / Monitoring Method
1. Lime/Gypsum throughput	105,000 tpy	12-month rolling time period as determined at the end of each calendar month	EURAWDRY	SC VI.5
2. Pelletized Product throughput	105,000tpy	12-month rolling time period as determined at the end of each calendar month	EUPRODDRY	SC VI.6
3. Lignin Sulfonate	3,150,000 pounds per year	12-month rolling time period as determined at the end of each calendar month	FGPELLETIZE	SC VI.7

The permittee shall only burn natural gas in EURAWDRAY and EUPRODDRY per SC II.4 which is the only fuel combusted in the facility's stationary equipment.

Process/Operational Restrictions –

Special Condition (SC) III.1 requires a malfunction abatement plan (MAP) be submitted within 60 days of permit issuance, and be implemented and maintained. The MAP was submitted on 1-3-2020 and is considered approved.

Maintenance orders on Baghouse 1 and 2 were reviewed for the following dates: 6-22-2020, 7-20-2020, and 7-21-2020. Bags were replaced in both baghouses due to wear and an operational issue that melted some bags. The baghouses are dye tested every 60-days to check for leaks. Daily maintenance checks are also done before and after operation. I recommended that dye tests and maintenance checks, be logged, and some other recordkeeping improvements.

Per SC III.3, all raw materials except for wet lime is to be stored inside. There was a large covered pile of gypsum outside a loading bay. A permit modification is needed if ProLime wants to make this a compliant practice which appears to be needed because there was covered pile of gypsum in this location when last inspected.

The following transfer points or their equivalent are mainly enclosed as required by SC III.4:

Point 2 – Feed conveyor to live bottom hopper

Point 3 – Live bottom hopper to raw product dryer

Point 4 – Silo to feed auger

Point 5 – Feed auger to mixer

Point 6 – Mixing auger to elevator

Point 10 – Elevator to screen

Point 12a – Screen to chain mill (oversize)

Point 14 – Elevator to conveyor

In compliance with SC III.5, the permittee uses an organic certified material as a dust suppressant and lignin sulfonate to control dust in product handling.

Design/Equipment Parameters –

The raw material dryer is controlled by Baghouse 1 (A). Baghouse 1 also controls Silos 1, 2, & 3, the chain mill, vibrator mill, and coating drum/pan. Baghouse 1 is installed in a satisfactory manner as required by SC IV.1.

The pelletizing (vibratory) dryer is controlled by Baghouse 2 (B). Baghouse 2 also controls the recycle belt and screens. Baghouse 2 is installed in a satisfactory manner as required by SC IV.2.

The two (2) baghouses are identical (30,000 cfm each) and vent to a common stack identified as SVBAGHOUSEAB.

Pressure drop is monitored continuously to ensure proper operation, and gauges are installed on the baghouses per the requirements of SC IV.3.

The lime and gypsum storage silos located outside are equipped with bin vent filters as required by SC IV.4 but have been vented to Baghouse 1. The recycle silos inside also have bin vent filters.

Per SC IV.5, the design heat input for EURAWDRY shall not exceed 18 MMBtu/hr. The maximum heat input on the unit installed is ~13.8 MMBtu/hr.

Per SC IV.6, the design heat input for EUPRODDRY shall not exceed 16 MMBtu/hr. The maximum heat input on the unit installed is a little over 12 MMBtu/hr.

Testing –

Testing of VOC emissions rates from FGPELLETIZE within 180 days of trial operation is required by SC V.1. The testing of PM/PM10/PM2.5 for EURAWDRY and/or EUPRODDRY is upon request per SC V.2. Testing of VOC emissions was completed on 11-5-2020 and the results are pending. PM/PM10/PM2.5 was not requested to be tested.

Monitoring/Recordkeeping –

ProLime is required to continuously monitor the pressure drop of each baghouse, and record it on a daily basis per SC VI.2. Monitoring and recordkeeping logs were reviewed and are satisfactory.

Visible emissions from each stack in FGPELLETIZE are required to be observed on a daily basis when operating per SC VI.3. Since the lime silo and gypsum silo have been vented to baghouse 1, only daily observations from the common stack for the baghouses need to be observed. The worksheet for visible emissions checks has been developed and monitoring of visible emissions from the baghouse common stack is done daily by a non-certified observer. No visible emissions have been observed from the stack to date according to the records.

Monthly records of the hours of operation, lime and gypsum throughput, pelletized product output, and lignin sulfonate are all being kept as required by SCs VI.4, 5, 6, and 7. They are also working on a new daily log for recording of this information by the operators which can then be transferred to the monthly record and compiled. Copies of the Pelletizing Log from 7-11-2019 to 11-2-20 were obtained. Since 7-11-2019 to 10-22-20, approximately 9,454 tons of pelletized product has been produced from lime, synthetic gypsum, and dolamite (lime). The process on average operates 4 to 6 hours per day which means it may operate about 1560 hours in a 12-month period and so far is estimated to have operated approximately 650 hours since July based on the records. Prolime appears to be in compliance with all material and operating limits. I made some recordkeeping suggestions when I reviewed the recordkeeping.

Reporting –

Within 30 days after completion of construction, a notification needs to be submitted per SC VII.1. This notice was received on March 3, 2020.

Stack/vent Restriction –

Confirmation was received on 1-8-2020 that construction of SVBAGHOUSEAB (vents Baghouses 1 & 2) had been completed and was at the permitted height of 55 ft (SC VIII.1).

The emissions from SVBINVENTA and SVBINVENTB have been ducted to Baghouse 1 and will vent out of SVBAGHOUSEAB. SVBAGHOUSEAB vents at 55 ft, and SVBINVENTA and SVBINVENTB are permitted to vent at 45 ft so this is acceptable.

FGFUGITIVES –

SC III.1 required a fugitive dust plan be submitted within 60 days of permit issuance, and be implemented and maintained. The plan was submitted on 1-3-2020. It includes measures to minimize dust from roadways (dust suppressants), product loadout (minimize drop distances), and for outdoor loading in order to also meet the requirements in SC III.2 & 3.

Records for VE observations per SC VI. 2 and for water and dust suppressant application per SC VI. 3 have been developed and are used. Roads were wet upon my arrive and no road dust was observed. The process itself is dusty and material will accumulate on the floors around and under process equipment. It was not visually observed blowing out open doors but a fine layer of dust did deposit outside of the open overhead doors. Sweeping and wetting of materials outside or closing open doors during operations is something the facility needs to improve on. The nearest neighbors are greater than 900 feet away and so far there have been no dust complaints.

Summary:

The facility appeared to be in compliance with PTI 41-18, and air quality rules and regulations. Pending the results of the VOC testing, it is recommended that any adjustments to PTI 41-18 such as storage of materials outside, equipment configurations and names be applied for.

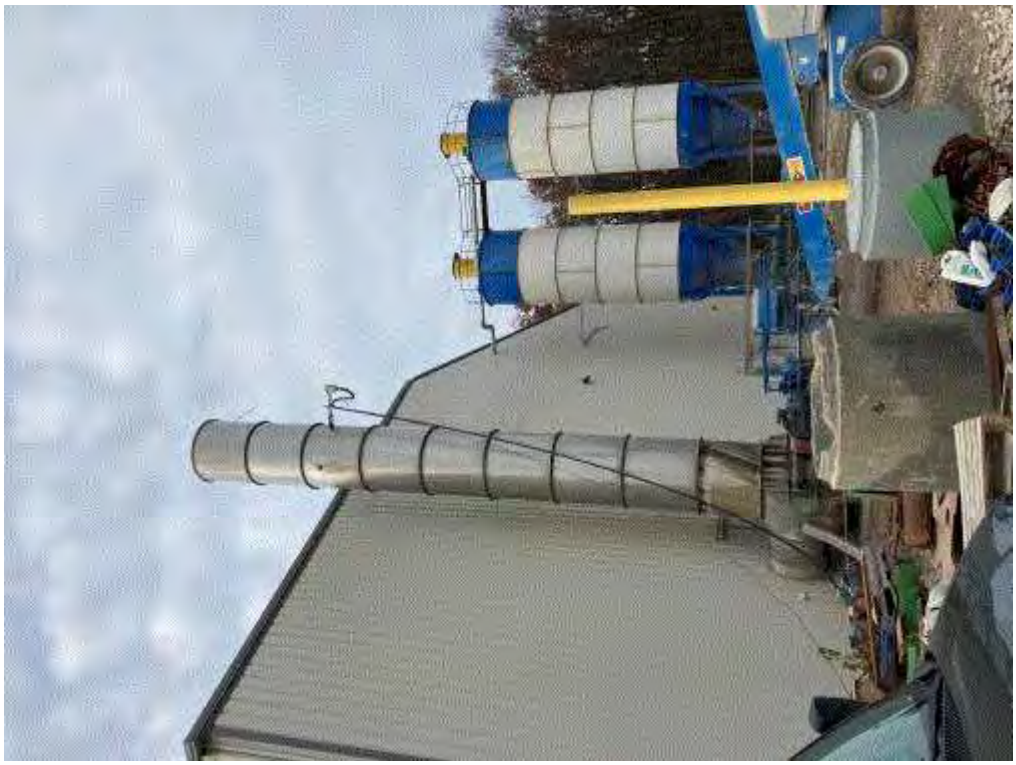

Image 1(04) : Stack with testing set up

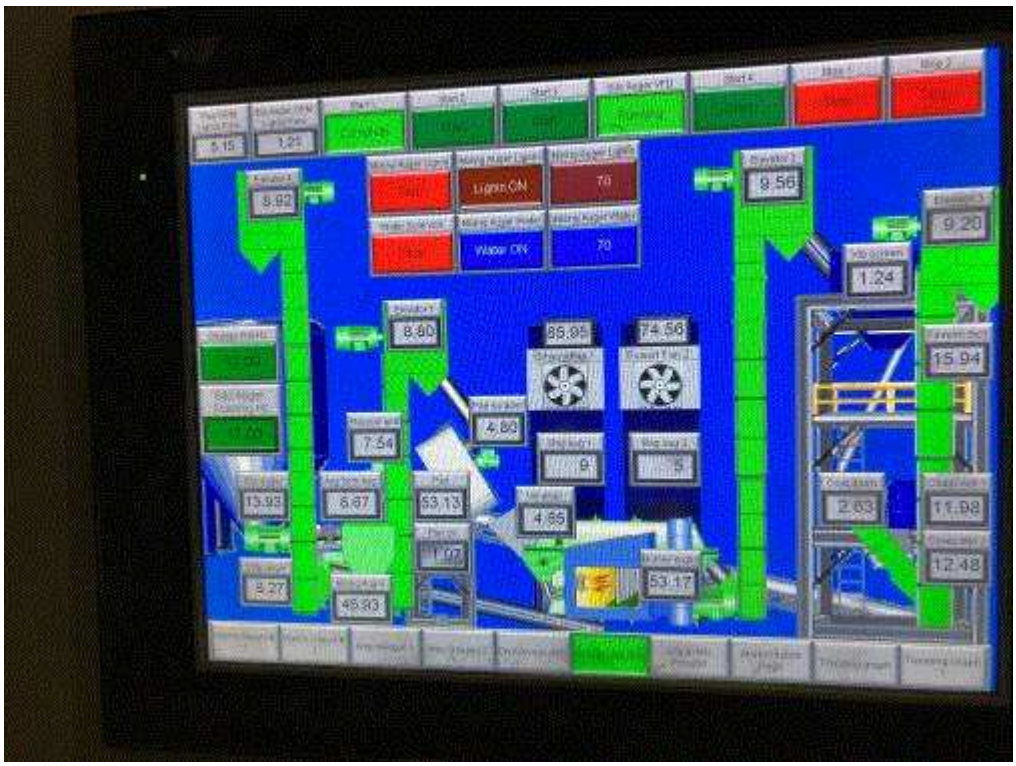

Image 2(43) : Operations screen

NAME Julie L. Brunner DATE 11/17/2020 SUPERVISOR B. M.