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

N179469102

FACILITY: Atlas EPS, a Division of Atlas Roofing Corp.		**SRN / ID:** N1794
LOCATION: 8240 Byron Center Rd., BYRON CENTER		**DISTRICT:** Grand Rapids
CITY: BYRON CENTER		**COUNTY:** KENT
CONTACT: Tim Van Hoeven , Plant Manager		**ACTIVITY DATE:** 08/15/2023
STAFF: April Lazzaro	**COMPLIANCE STATUS:** Non Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Unannounced, scheduled inspection.		
RESOLVED COMPLAINTS:		

Staff, April Lazzaro arrived at the facility to conduct an unannounced, scheduled inspection. There were no significant odors, and no visible emissions noted at that time. I was received in the vestibule by an Atlas employee who contacted Tim Van Hoeven, Plant Manager who went over safety procedures for the facility. Following the safety protocol, we discussed the purpose of the inspection.

FACILITY DESCRIPTION

Atlas EPS, A Division of Atlas Roofing Corporation (Atlas) is a manufacturer of expandable polystyrene (EPS) and is the largest source of volatile organic compounds (VOC) in the Grand Rapids District with over 200 tons of VOC emissions. The facility operates pursuant to Renewable Operating Permit (ROP) No. MI-ROP-N1794-2017a, which is currently undergoing the renewal process and inclusion of Permit to Install 82-21A. Atlas is located in southwest Kent County in a residential area between an elementary school and residential homes and adjacent to commercial businesses. The facility itself consists of two buildings that are connected via a corridor. Atlas uses the EPS beads to make polystyrene foam and foam products. The products are primarily used for construction related activities, including garage doors and other insulation-type products. Atlas receives the raw material as a very small, hollow polystyrene bead that is then expanded; pentane is the blowing agent contained in the bead which allows for the bead to expand when steam is applied. A blowing agent is a substance which changes the cellular structure via a foaming process. When steam is applied, the pentane is released from the bead, causing it to expand in size (30x) and harden. As such, the primary pollutant emitted at Atlas is pentane, which is VOC. Pentane is not identified as a hazardous air pollutant (HAP) according to the EPA yet is identified as a toxic air contaminant according to State of Michigan Air Quality Division (AQD) air toxics rules with an Initial Threshold Screening Level (ITSL) of 17,700 µg/m³ over an 8-hour average which is the equivalent of 17.7 ppm. A Safety Data Sheet found online states that the odor is "gasoline-like" and has an odor threshold of 2.2 ppm. Pentane is highly flammable and heavier than air. The raw material also contains smaller amounts of ethylbenzene and styrene which are individually limited in the permit.

The first stage of the process is called pre-expansion and the tiny bead is exposed to heat and steam which causes it to expand. Atlas uses two boilers to provide steam for the polystyrene foam process. Atlas has two batch expansion machines, (EUEXPANDER5 and EUEXPANDER6) and the emissions of pentane generated during the expansion process are ducted through moisture knock-out pots, and then to a thermal oxidizer for emissions reduction. Approximately 13.2% of the pentane in the beads is released during pre-expansion based on new data provided by the company during the permitting process for PTI No. 18-21A. Data calculated following the March 22, 2022, stack test indicated that the average pentane loss for the specific beads processed at the RTO was 12.89%. After pre-expansion, the beads are stored (EUBEADAGING) to allow for further off-gassing of the pentane. The pentane emissions from the bead storage are released to the atmosphere though the in-plant ventilation and remain there anywhere from four hours to three days. The next stage is molding, and Atlas currently has four molding machines (EUMOLD5-8). Steam is used again at the molding machines to press and form large rectangular blocks out of the expanded beads. After molding, the blocks are held in storage for a prescribed amount of time to allow them to age to get to the right moisture content. They may be put in one of several "hot" rooms which are heated up to 140°F. After the correct moisture content has been achieved, the foam blocks are cut to the desired length and thickness at one of four cutting lines (EUCUTTING). Some foam may also be embossed on the one embossing line (EUEMBOSSING). Embossing is the creation of an impression in the foam, which can create a pattern and changes the density. Atlas also recycles scrap foam in-house which is shredded and re-condensed. Some of the recycled foam is reused at the facility, but most is externally sold.

Atlas has made several changes to equipment at the facility recently and in the past five (5) years, which have been permitted through the Permit to Install process. The first change included replacing an older expander and moving the existing expander closer to the regenerative thermal oxidizer (RTO). This change was subsequently incorporated into the Renewable Operating Permit as a modification. As a part of that project, Atlas removed two

older boilers and installed one new boiler. An existing smaller boiler was moved into the boiler room. The new boiler at 12.563 mmBtu/hr was identified in the permit to install (PTI) application as being subject to the New Source Performance Standard Dc, which is found in 40 CFR Part 60 Subpart Dc. This boiler is fueled by natural gas and as such the only requirement is to record fuel usage. Per AQD guidance, the facility may prorate or predict natural gas usage, with the prior approval of the AQD District Supervisor. Atlas EPS utilizes this alternate method.

Most recently, 2 additional PTI modifications have been reviewed and issued. One was to replace the existing thermal oxidizer with a new regenerative thermal oxidizer (RTO) pursuant to PTI No. 18-21, which was required due to a reduction in stack height associated with the new equipment. The second modification pursuant to PTI No. 82-21A was to replace EUMOLD4 with EUMOLD8, which is larger and has a faster production capacity. During the permitting process, Atlas reevaluated the emissions profile for the facility operations. This means that they changed the distribution of emissions that are generated at each phase of the operation. This was done to avoid Prevention of Significant Deterioration (PSD) review, and to keep the project emissions below the 40 ton level. Whether the project is below that level is still under review by the AQD, pending acceptable results from the EUMOLD8 stack testing.

COMPLIANCE EVALUATION

FGEPS

This flexible group contains 8 emission units that include the two expanders, four molds, bead ageing and the RTO. The facility is operating EUMOLD8 pursuant to PTI 82-21A, for which a minor modification was submitted on February 14, 2022. The emission limits include emissions from all operations combined. The company is required to utilize a specific method of calculation as described in the permit to demonstrate compliance with the emission limits. There are 10 stacks listed as being associated with these emission units. It is noted that EUEXPANDER6 bypass stack is not currently in the permit, and Atlas has been informed that a PTI modification would be needed to have that added to the permit. Additionally, Atlas noted that SV0205 is labeled EUMOLD7 vacuum, however, it is actually the EUMOLD5 vacuum stack. Atlas should submit a PTI modification to correct these discrepancies.

Emission Limit(s)

Emissions of VOC's are limited to 272.4 lb/hr based on the daily hours of operation and 374.5 tons per year based on a 12-month rolling time period as determined at the end of each calendar month. Since the 2021 inspection, Atlas EPS has begun to conduct the required lab testing of the finished product on an annual basis, and typically occurs in June. That value is used to determine the VOC retention factor of the products tested which is necessary to conduct the calculation specified in the permit. This number varies and is product specific. The highest reported daily VOC emission rate for the time period of January 2022-July 2023 was in July 2022 at 134.03 pounds. This value indicates compliance with the limit. The reported 12-month rolling total VOC emissions through July 2023 are reported at 186.46 tons. This value indicates compliance with the limit.

Based on the new EUMOLD8 installation, the permit now includes styrene emission limits and a VOC limit specifically from that mold. The styrene emissions are limited to 80 lb/month and VOC are limited to 23.9 tons per 12-month rolling time period. The company calculates styrene and VOC emissions based on the styrene content of each product and assumed losses based on beads molded in EUMOLD8. Reported VOC and styrene emissions for the 12- month rolling time period ending in July 2023 are 0.66 tons of VOC and the highest reported month of styrene emissions was July 2023 at 46.06 pounds. Both reported values indicate compliance with the limits.

There is also a limit for VOC loss from EUMOLD8 of 4.87% which is based on stack testing. That stack testing is upcoming.

Material Limit(s)

Material limits consist of 16,600 lb/yr for ethylbenzene processed and 84,400 lb/yr for styrene processed, both based on a 12-month rolling time period as determined at the end of each calendar month. The reported ethylbenzene and styrene processed for the 12-month rolling time period ending in July 2023 were 1,422.04 lbs and 2,844.07 lbs respectively.

Process/Operational Restriction(s)

The permit requires that the feed to the expanders shall cease immediately, upon initiation of the thermal oxidizer bypass. I discussed with Atlas whether or not there is a bypass and was informed that there is no thermal oxidizer bypass on the unit.

The permit states that the permittee shall not operate more than 4 block mold machines at any given time. The permittee currently only has 4 operational block mold machines.

FGEPS and the associated thermal oxidizer has Compliance Assurance Monitoring (CAM) requirements. The permit requires that the permittee shall not operate the thermal oxidizer unless it is operating under a negative pressure. This is measured in the plant at the expanders. If the expanders are not under negative pressure, a blue light will flash, and the units will shut down. The system is currently monitoring and recording negative pressure from the gauge nearest the RTO.

Since the last inspection, a ROP renewal application has been submitted, and is nearing the Public Comment phase. The monitoring provisions for the RTO related to CAM has also been updated along with this permitting action. Atlas EPS is monitoring and recording pressure drop of the system, which is equipped with an interlock if pressure parameters are out of range.

Design/Equipment Parameter(s)

The permittee has equipped the thermal oxidizer with a continuous temperature indicator and recorder. Temperature records were requested, reviewed and were found to be acceptable.

The permittee shall not input feed into any expander unless it is vented to the thermal oxidizer that is installed and operated in a satisfactory manner. Satisfactory manner includes maintaining a minimum VOC destruction efficiency in the thermal oxidizer of 95% by weight a minimum combustion temperature of 1,500°F and retention time of 0.25 seconds. The system is equipped with a series of interlocks to prevent the expanders from operating if the RTO or pressures are not within programmed parameters.

During the inspection, the RTO was operating at 1,748°F. The pressure drop reading for the process capture system which measures closest to the RTO was at -1.6" H_2O, and the filter pressure drop was 0.9" H_2O.

Testing/Sampling

The permittee is required to verify VOC emission rates for the thermal oxidizer and establish parameters to ensure the capture system is operating under negative pressure by testing once every five years. The last test was on March 22, 2022.

The permittee is required to determine the VOC content as received and as shipped of product from FGEPS. Atlas EPS continues annual bead sampling to determine the VOC content of product as shipped. As previously noted, this typically occurs in June each year.

The permittee is required to verify the styrene emission rate from EUMOLD8 and the VOC emission rate including the percent of VOC lost from the EPS beads during molding. Atlas has attempted stack testing twice however, neither has been successful for various reasons. The next test is tentatively scheduled for September 28, 2023. Since the testing has not been completed, the facility is considered in non-compliance with this permit condition. At this time, a Violation Notice (VN) will not be sent, (a VN was issued in 2022 that is unresolved) however the compliance status for this report must be marked as non-compliance.

Monitoring/Recordkeeping

The permittee is required to record the daily hours for the EPS process. The facility is currently recording 24 hours a day of operation, which is based on whether or not the expanders are operational. There are emissions that occur from ageing, even if the expanders are operational, however the calculation in the permit that the facility utilizes does not correct for this scenario.

The permittee appears to be accurately recording the monthly throughput at pre-expansion for each lot of EPS beads. The permittee records monthly pounds of regrind under a heading of "recycle" in the spreadsheet.

The permittee records the pounds of VOC per 100 pounds of EPS beads as received, for each lot of EPS beads used. This mathematical expression is just another way of writing the pentane content as an equivalent to weight percent, which is the value available on the Certificate of Analysis or based on specific bead testing.

The permittee is required to record the total VOC emissions emitted at pre-expansion and the VOC destruction efficiency of the thermal oxidizer. The VOC destruction efficiency for the new RTO has been updated.

The permittee appears to be maintaining the ethylbenzene and styrene containing material calculations correctly.

The permittee is continuously monitoring the thermal oxidizer temperature, and no apparent monitoring malfunctions or data exclusions were identified.

Atlas EPS is also required to maintain recordkeeping in accordance with the calculations in the permit to demonstrate compliance with Rule 336.2818. Since testing on Mold 8 has not been completed and is necessary for accurate data, compliance with the annual calculation will be determined during the next inspection.

Reporting

Annual and semi-annual reports have been received timely.

Stack/Vent Restriction(s)

Atlas EPS has indicated that all the stacks are sized as permitted. During the most recent permitting process, AQD required updated stack information from the company to ensure accuracy. It is noted that there are 2 errors in the stack information, and AQD has recommended that Atlas revise the permit to accurately reflect the facilities configuration.

Other Requirement(s)

The other requirements are associated with the CAM Plan, which has been updated since the last inspection.

FGRULE290

The Rule 290 flexible group is used for the one embossing processes at the facility. This was updated during the ROP renewal process, and the facility determined the cutting operations can utilize the Rule 285(2)(l)(vi) exemption. As previously described, embossing is where the foam is pressed into a specific shape, or a design is pressed into the cut piece. Emissions generated from embossing are pentane and non-carcinogenic particulate matter. The permittee is keeping records of emissions from embossing which were provided.

COMPLIANCE SUMMARY

Atlas was in non-compliance at the time of the inspection.

NAME April Lazzaro DATE 09/21/2023 SUPERVISOR HH