Chris Robinson, Environmental Quality Analyst

EGLE, AQD, Grand Rapids District Office

350 Ottawa Avenue, Unit 10

Grand Rapids, MI 49503

May 6, 2022

SRN: P1126, Ottawa County

Dear Chris Robinson –

We have received above referenced Violation Notice.

Please see attached our Root Cause Analysis and our proposal for corrective action.

Please let me know if you have any questions

Sincerely,

Mario Veldhuijzen

Innotec, Corp – Automation Division

(616)990-1727

Copy:

Jenine Camilleri, Enforcement Unit Supervisor

EGLE, AQD,

P.O. Box 30260

Lansing, Michigan 48909-7760.

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INNOTEC INNVIROMASS® / 233 W. Washington / EGLE-AQD Violation Notice

1. TEAM:

- Zach Henley, Eric Bixler, Tom VanderHenst, Nic Berkenpas, Bryan Lanser, Mike Lanser
- Champion: Mario Veldhuijzen
- Customer: Chris Robinson / EGLE and 233 W. Washington neighborhood

2. PROBLEM DESCRIPTION:

On Friday April 19, 2022; 8:37am, Mario Veldhuijzen received an e-mail from Hillary Hansen, EGLE, with a Violation Notice, written by Chris Robinson: '*On March 16, 2022, March 21, 2022, March 25, 2022, March 29, 2022 and April 7, 2022, the Department of Environment, Great Lakes, and Energy (EGLE), Air Quality Division (AQD), conducted odor evaluations of Innotec located at 233 West Washington, Zeeland, Michigan. The AQD staff detected moderate to strong odors impacting nearby neighborhoods downwind from Innotec on five (5) occasions. In the professional judgment of AQD staff, the odors that were observed were of sufficient intensity, frequency and duration so as to constitute a violation of Rule 901 of the administrative rules promulgated under Act 451.*'
Since 'odor' is a subjective judgement, we do not know what 'moderate' or 'strong' means; however, we have investigated the potential of odor emissions from Innotec on the mentioned days and strongly desire to be good neighbors. Innotec will initiate a root cause analysis and implement corrective action as appropriate in order to mitigate odor emissions identified.

3. INTERIM CORRECTIVE ACTION:

Chris Robinson from EGLE identified 3 areas of potential concern:

1. There is a stack originating from a regrind dryer. This process was specifically mentioned in Innotec's exemption submission in 2019, however, this process has not been utilized for over a year. Innotec has removed the associated process equipment; the process exhaust stack remains above the roofline and could be removed anytime – but this removal would require a crane and has not yet been undertaken. This former process is not a source of odor emissions.
2. There is an exhaust stack from the extrusion process. A simple 'smell' test on the roof indicates that this process is not a significant source of potential odor from the facility. Innotec anticipates that emissions from the extrusion molding of HDPE and dried millscale to be minimal.
3. There is a stack originating from the millscale drying process. This process at times may result in odor emissions due to the radiant heat applied to the millscale. In an effort to mitigate potential odor emissions from the process, the Innviromass® team has executed 2 projects:
    a. A few days before the second neighborhood odor complaint on 3/21/2022, the team had executed a project to consolidate natural gas burners at the entrance of the dryer; this project was intended to create space for the installation of additional burners in order to increase the millscale feed rate speed and to increase overall drying efficiency, expecting odor reduction. However, due to the higher heat transfer to the millscale, Innotec believes the potential for odor emission actually increased. This burner consolidation project was reversed on 3/28/2022;
    b. The engineering controls for emissions from the millscale drying process are a wet particulate collector and a wet 'scrubber' (the 'blue tank' - which acts as a knock-out pot/pad demister) in sequence. These units provide filterable particulate control and condensable particulate control, respectively. The system was 'deep cleaned' on 3/29/2022. While odor mitigation effects were anticipated from this maintenance of the

emission controls, odor was still observed in the neighborhood following implementation of the deep clean.

4. **ROOT CAUSE**:

HOW MAY ODOR BE CREATED?

As mentioned in the 'Interim Corrective Action' section, we have focused our attention on the millscale dryer.

- Innotec has been drying millscale since 2009. Initially, we dried this material in a fluid-bed dryer; this process generated dust emissions, but to the best of our knowledge, no odor complaints were received during operation of this dryer. In the fall of 2017, we converted the dryer to an infra-red, conveyor bed style dryer; this reduced dust emissions, but the initial odor complaints were received in 2018. A mitigation effort was initiated by installing the wet collector and wet scrubber. This mitigation effort, potentially in conjunction with a reduction in operations due to COVID shutdowns, reduced the complaints to zero during 2019/2020/2021.
- Key for us is to understand the difference in drying technologies that could impact generation of odor. The fluid bed drying technology heats material consistently; the infra-red method results in high temperature on the millscale surface, while the core and bottom of the millscale stream could still be at a significantly lower temperature. Innotec is investigating the potential that milling oil residue on the millscale, when heated to a sufficient temperature, may create undesired odor in the form of vapor emissions and/or smoke – this temperature point may not have been reached with the previous fluid bed drying system.
  There is the potential that odor from the current millscale drying operation is associated with smoke associated with exposure of the milling oil to elevated temperature. The smoke point of a typical industrial oil is in the 400F to 500F range – significantly higher than temperature needed to evaporate water. In our infra-red dryer, surface temperature of millscale could exceed this temperature. Likely, our fluid-bed dryer did not reach these surface temperatures. A reduction in millscale surface temperature within the drying operation may mitigate potential odor emissions.
- We have observed that certain weather conditions, mostly observed in spring and fall, may contribute to odor potential. Also, millscale is more wet in spring and fall; and the spring of 2022 in particular has been excessively wet.
- Innotec is evaluating these potential root causes and that elevated heating of the surface area of millscale may create undesired odor in the form of vapor emissions and/or smoke from the residual milling oil in the millscale .

HOW COULD ODOR ESCAPE OUR FACILITY?

We – and none of contractors we have contacted – are aware of anyone else who is drying millscale; our process is unique. We have been successful in limiting dust emissions with our current engineering controls.

There are a number of add-on emission control technologies which may further mitigate emissions of vapor and/or smoke that Innotec currently is evaluating; though none of these technologies are necessarily guaranteed to eliminate odor emissions:

- Water scrubber – building on the implementation of the current 'blue tank';
- Filtration, incl. HEPA – different options available, filter efficiency and lifespan varies;
- Electrostatic precipitator – performance appears to be hard to manage;
- After burner – high installation and operational cost and after-burner could introduce new odors and/or byproduct emissions.

5. **PERMANENT CORRECTIVE ACTION**:

HOW IS ODOR CREATED?

As stated in the root cause analysis, we continue to investigate the root cause of odor, focusing on surface temperature/overheating in the dryer. We will continue the investigation; with the intent to develop a plan to eliminate this root cause. We propose to take 60 days (7/6/2022) to develop a proposal for this plan, with an interim update to AQD after 30 (6/6/2022) days.

HOW DOES 'ODOR' ESCAPE OUR FACILITY?

In 2019, as odor appeared to have significantly reduced in significance, we paused improvement of our 'wet scrubber' (='blue tank'). We will replace the steel wool in this tank by 5/14/2022; we are proposing to implement HEPA filtration to this tank on an interim basis and test its effectiveness by: 6/17/2022. Following a period of operation, effectiveness of this HEPA filtration will be evaluated and considered as a final control or if additional controls will be needed.

6. **Implement / Validate:**

7. **Prevention:**

8. **Close:**