



April 20, 2023
Project No. 220602

Scott Miller
Jackson District Office
Air Quality Division
Michigan Department of Environment, Great Lakes, and Energy
State Office Building, 4th Floor
301 East Louis Glick Highway
Jackson, MI 49201-1535

Response to the Violation Notice Dated April 7, 2023
Crimson Holdings (SRN E8117)
Adrian, Michigan

Dear Scott:

On April 7, 2023, the Michigan Department of Environment, Great Lakes and Energy, Air Quality Division (EGLE-AQD) issued a Violation Notice (VN) to Crimson Holdings, LLC (Crimson Holdings) alleging a violation of Rule 901(b). The specific allegations cited in the VN are as follows.

Process Description	Rule/Permit Condition Violated	Comments
Powdered Egg Manufacturing Facility	R 336.1901(b)	On April 4, 2023, AQD staff followed up on ongoing complaints that were received concerning odors coming from this facility. AQD staff verified that these odors were in violation of Rule 901(b).

You have requested a response from Crimson Holdings by April 21, 2023 that includes: the date the alleged violation occurred; an explanation of the cause(s) and duration of the alleged violation; whether the violation is ongoing; a summary of the action(s) that have been taken and are proposed to be taken to correct the violation; the date(s) by which these action(s) will take place; and what steps are being taken to prevent a reoccurrence. The following is Crimson's response to the VN.

Rule 901(b) Violation

First, we have struggled to correlate the odor complaints and observation referenced in the VN with specific activities and operations at the plant. Historically, complaints have been received regarding odors emanating from both the stack exhaust and wastewater treatment plant (WWTP), or dissolved air flotation (DAF) room. As you know, Crimson Holdings is not operating 24 hours a day and accurate, complete, and specific complaint information in a timely manner would help us to correlate complaints with company operations in order to determine where and what additional mitigation efforts may be needed to be taken at the plant

For example, Crimson Holdings was testing the new nanobubbles system the week of April 3. In fact, the contractor (Kadance Corporation [Kadance]) was onsite working with Crimson Holdings staff to set up the test. At the same time EGLE visited on April 4. To conduct the test, Crimson Holdings secured an especially putrid tank of wastewater and administered the nanobubble treatment – this process began while EGLE was onsite. While all of the samples have not been evaluated, and the final report has not been issued, preliminary results suggest that the nanobubble wastewater treatment system is effective in both reducing biological oxygen demand and reducing odors from the DAF Room. Had EGLE remained on site or returned hours later, they would have seen that there were no odors. While testing the NanO₂ system, the DAF room exhaust fan was operating that likely contributed to odors around the plant.

Crimson Holdings had also indicated to EGLE it would stop using the odor neutralizer for a period of time to see if that impacted the dispersion of the stack exhaust. The odor neutralizer was not in use when EGLE was onsite and this may have impacted odors from the stack. Crimson Holdings requested information from EGLE on previous complaints that specifically mentioned the odor neutralizer to see if the complainants' noticed improvement since Crimson Holdings has discontinued its use. While we are not committed to permanently eliminating use of the neutralizer, we are interested in feedback on odors when it is not in use.

Planned Mitigation

A. Wastewater Treatment System and NanO₂ Follow-up

As we previously indicated, Crimson Holdings tested the new Kadance nanobubbles system which would provide more available oxygen to the DAF system. This technology acts in a similar way to a hypochlorite scrubber and would act in that it will oxidize the odor causing chemicals within the DAF system and eliminate their odor. The technology employs very small oxygen bubbles to oxidize compounds and reduce odors. No chemicals are used in the process. In addition, we are also planning to test the same technology on liquid eggs received at the plant to determine whether odors from the liquid egg could also be eliminated with this technology. A detailed list of proposed odor-reducing activities is included as Attachment 1 along with a schedule for completion.

Additional activities taking place to further reduce odors include changes to the WWTP, as recommended by its contractor, Digested Organics, Inc., which EGLE staff encountered while they were onsite on March 24. While changes to the WWTP are designed to reduce biochemical oxygen demand (BOD), these changes should also reduce odors. Additional information on this work will be made available to EGLE when testing is finished and the results have been evaluated.

Crimson Holdings has additional plans to test whether adding the nanobubbles to the actual liquid egg product prior to processing will reduce odors associated with the drying process as well as use of a nanobubbles mist to evaluate whether it could reduce odors in the exhaust stack.

B. Stack Exhaust Evaluation

EGLE suggested that the new stack is not effective in reducing odors from the facility. We disagree. While the stack may not have completely eliminated odors, it has mitigated odors in and around the plant. We believe that the new stack has reduced odors and outlined in EGLE's staff report from its March 22, 2023 site visit. We think that the odors identified by EGLE on April 4 were reduced before they left the area based on conversations between Crimson Holdings staff and EGLE personnel at the site. EGLE suggested that the velocity in the stack may not be high enough. Crimson Holdings believes that when the wind speed is above 10-15 mph blowing to the west the stack exhaust will not be as buoyant as at lower speeds.

In order to further address the potential for odors associated with the stack, Crimson will evaluate stack velocity. Testing conducted the week of April 3 includes information on stack velocity; once we have the stack testing report, we will share it with EGLE. Crimson Holdings knows that stack velocity can be increased in a number of

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ways including installing an additional fan or adding an additional exhaust point. Changes to the exhaust velocity could improve loft and prevent the effects of higher wind speeds.

In addition, we have discontinued use of the Chemtreat odor neutralizer which could have affected the level of odor. We plan a trial test of a new odor neutralizer that has no scent as well as determine whether stack velocity adjustments are needed.

C. Scrubber Installation

Crimson Holdings has also contacted three vendors about installing a new wet scrubber system. We are following up with the Tri-Mer Corporation (Tri-Mer®) to obtain additional information on a new packed-bed scrubber. Most likely, the spray dryer exhaust would vent through the packed-bed scrubber instead of the existing stack. Unfortunately, based on preliminary discussions with Tri-Mer, the lead time on the scrubber, including engineering required for the auxiliary equipment and new chemical delivery systems, would be at least 10 months. Crimson Holdings is continuing to work with Tri-Mer on this and will share additional information on the scrubber installation as it becomes available. As indicated in our call on April 19th, a wet scrubber is best suited for addressing the ammonia, in Crimson's exhaust, which is associated with the observed odors. Most importantly, we want to make sure that the system ultimately selected, will provide the best long-term solution.

Conclusion

Crimson Holdings has and will continue to work cooperatively with EGLE to address the Agency's concerns and is committed to following the attached schedule even though Crimson Holdings does not believe EGLE's observations on April 4, 2023, warrant escalated enforcement. It should be noted that the as the odor investigation was performed at the beginning of a test project for the new nanobubbles wastewater treatment system. Had EGLE come out later in the day, they would have noted an improvement in odors from the system. We are hopeful that discontinuing the use of the Chemtreat odor neutralizer will continue to have a positive impact and that the additional measures being explored will eliminate any remaining objectional odors.

If you have any questions, please contact me at dhofbauer@crimsonhldg.com (517.208.0904) or our environmental consultant, Lillian Woolley, of Fishbeck, at lwoolley@fishbeck.com (586.489.6876).

Sincerely,



Dan Hofbauer
Plant Manager

By email

Copy: Andrew Drury – EGLE -AQD
Chris Ethridge – EGLE-AQD
Malcolm Mead O'Brien – EGLE-AQD
Stephanie Weems – EGLE-AQD
Susan Johnson – Butzel
Lillian L. Woolley, PE – Fishbeck

Attachment 1

Response to Letter Dated April 7, 2023

Action Item	Task	Due Date
Stack Velocity	Provide results of stack testing to EGLE	May 1, 2023
	Compare actual velocity to velocity required to provide adequate lift	May 5, 2023
	Review results of stack test, set up call with EGLE to discuss required lift	May 5, 2023
Kadance NanO2 Technology - DAF Room	Set up call with EGLE (AQD/WRD) to discuss NanO2 technology and results from DAF room test project	April 28, 2023
	Request information from Kadance on securing a rental unit until final unit is delivered and installed (provided meeting with EGLE includes a recommendation to install).	April 30, 2023
	Receive system quote and complete purchase agreement for DAF room system. System will be designed to provide supplemental water for drains or stack. Purchase is contingent upon review of NanO2 with EGLE.	May 31, 2023
	Once the purchase agreement is signed, Crimson Holdings will provide a schedule for the equipment delivery and installation. This is planned for 12-15 weeks with the oxygen collector schedule being the critical path.	May 31, 2023
	Order ORP meter and/or DO meter. Discuss ranges with Kadance to develop acceptable operating ranges to ensure oxygen saturation of the waste water.	August 16, 2023
	Tentative date to start installation	September 13, 2023
	Update NOMP with information on proper use of the NanO2 system	October 31, 2023
	Stack trials with NanO2 the weeks of May 1 and 8 - record information on NanO2 water usage, ORP or DO levels, wind direction and speed, temperature, humidity, dew point and pressure, dryer exhaust temperature and egg feed rate	May 12, 2023

Kadance NanO2 Technology - Exhaust Stack Odors	Develop a test schedule with EGLE and a methodology for assessing odors	April 30, 2023
	Request complaint information for each week - available by Wednesday of the following week for Week 1	May 10, 2023
	Request complaint information for each week - available by Wednesday of the following week for Week 2	May 17, 2023
	Provide a report to EGLE on the use of he NanO2 water on stack exhaust	May 31, 2023
	Set up call to review stack trials with EGLE	June 16, 2023
Scrubber evaluation	Provide information on scrubbers evaluated	May 1, 2023
	Set up call to review scrubbers evaluated and discuss with EGLE	May 17, 2023
	Update and finalize scrubber quote based on discussions with EGLE	June 20, 2023
	Receive final bids for civil work to support construction of the required scrubber	July 13, 2023
	Confirm scrubber selection with EGLE and Crimson Holdings commitment to installation and operation	July 13, 2023
	Confirm timeline for construction and system start-up	June 20, 2023
	Apply for PTI to allow replacement of the existing system with a new scrubber on the exhaust stack based on EGLE and Crimson Holdings discussion and agreement	June 20, 2023