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DEPARTMENT OF ENVIRONMENTAL QUALITY
 AIR QUALITY DIVISION
 ACTIVITY REPORT: Scheduled Inspection

N116233625

FACILITY: MBI International		SRN / ID: N1162
LOCATION: 3900 COLLINS RD, LANSING		DISTRICT: Lansing
CITY: LANSING		COUNTY: INGHAM
CONTACT: Tim Campbell, Project Manager		ACTIVITY DATE: 03/09/2016
STAFF: Daniel McGeen	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: MINOR
SUBJECT: Unannounced, scheduled inspection of facility which was last inspected by AQD in 2008.		
RESOLVED COMPLAINTS:		

On 3/9/2016, the Department of Environmental Quality (DEQ), Air Quality Division (AQD) conducted an unannounced, scheduled inspection of MBI International (MBI), which was last inspected by AQD in 2008.

Note: As of 4/1/2016, the facility is now owned by Michigan State University (MSU).

Facility environmental contacts:

Tim Campbell; Project Manager - Bioprocess Operations; 517-336-4631; campbell@mbi.org

John Glassbrook, Bioprocess Equipment Design & Fabrication; 517-337-3181; glassbrook@mbi.org

Jeremy Johnson; Tanner Industries, Inc.; 1-800-643-6226; jjohnson@tannerind.com

Facility description:

This facility is utilized for biotechnology development. Pilot projects are created here, and are then scaled up to larger size working models, within a laboratory setting.

Emission units:

Emission unit	Emission unit description	PTI No., or exemption rule	Federal regulations	Compliance status
Anhydrous Ammonia Supply System	Leased 1,000 gallon storage tank, with bypass to the Ammonia Capture System	127-07	NA	Noncompliance
Ammonia Capture System (scrubber)	Countercurrent packed column ammonia absorber for liquid and/or gaseous ammonia	Rule 283(1)(a) (viii)	NA	Compliance
Boilers	Two 400 horsepower (hp) and one 250 hp natural gas and no. 2 fuel oil-fired boilers	575-85	40 CFR Part 63, Subpart DDDDD	Did not observe

*An *emission unit* is any part of a stationary source that emits or has the potential to emit an air contaminant.

Regulatory overview:

This facility is considered to be a true *minor source*, rather than a *major source*. A major source has the potential to emit (PTE) of 100 tons per year (TPY) or more, of one of the criteria pollutants. *Criteria pollutants* are those for which a National Ambient Air Quality Standard exists, and include carbon monoxide, nitrogen oxides, sulfur dioxide, volatile organic compounds (VOCs), lead, particulate matter smaller than 10 microns, and particulate matter smaller than 2.5 microns.

As of the 3/9/2016 date of this inspection, MBI was considered a minor or *area source* for Hazardous Air Pollutants (HAPs), because it was not considered to have a PTE of 10 TPY or more for a single HAP, nor to have a PTE of 25 TPY or more for combined HAPs. However, subsequent acquisition of this facility by MSU, itself a major HAPs source, makes this facility a major HAP source.

MBI received general Permit to Install (PTI) No. 127-07 on 4/5/2007, for an anhydrous ammonia storage and handling process. A scrubber, the Ammonia Capture System, was identified in the PTI application. The permit does not appear to cover a scrubber, but the scrubber may be considered exempt under the Rule 283(1)(a)(viii) exemption, as discussed in the 11/13/2008 inspection activity report. This exemption covers pilot processes or process equipment using best available control technology for toxics (T-BACT).

In 1985, Michigan Biotechnology Institute, as MBI was known at that time, received Permit to Install No. 575-85, for oil and natural gas-fired boilers. This PTI was not located in the Lansing District Office files, and I was therefore unaware of it, until some time after the inspection. A copy was found in the AQD Central Office permit files. The boilers are not subject to 40 CFR Part 60, Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, unless they were reconstructed or modified after 6/9/1989.

MBI used to own the MBI building, but subsequently leased it from the MSU Trust. However, not long after the 3/9/2016 inspection, MSU became the owner of the building. The PTI for the ammonia tank, No. 127-07, and the PTI for the boilers, No. 575-85, will therefore be rolled into the next renewal cycle for MSU's ROP, five years from now. The boilers are therefore subject to the major source boiler National Emissions Standards for Hazardous Air Pollutants (NESHAP), 40 CFR Part 63, Subpart DDDDD.

Note: MBI has had its own State registration Number (SRN), N1162, at least since the boiler PTI was issued in 1985. MSU, who has acquired this facility as of 4/1/2016, has its own SRN, K3249.

Fee status:

As of 3/9/2016, this facility was not considered fee-subject, because it was not a major source for criteria pollutants, nor a major source for Hazardous Air Pollutants (HAPs). Additionally, it was not a fee source because it was not subject to federal New Source Performance Standards nor federal Maximum Achievable Control Technology standards. The facility was not required to submit an annual air emissions report via the Michigan Air Emissions Reporting System (MAERS). However, recent acquisition by MSU makes it fee-subject, because MSU is classified as Category I-fee subject, for being a major source.

Location:

The MBI facility is located just west of farm fields belonging to MSU. Based on satellite images, there is a MSU horse teaching facility about 600 feet to the northeast of the anhydrous ammonia tank's location, and a Spring Arbor University building about 400 feet to the south. There is a hotel about 600 feet to the south of the tank, and US-127 is about 300 feet to the west of the tank.

Recent history:

The previous AQD inspection of this facility took place on 11/13/2008. On 8/12/2015, I had attempted to conduct an unannounced inspection of MBI International. In the facility lobby, I left a voice mail message for Mr. David Senyk, but did not hear back from him.

Arrival:

I detected no odors as I approached the facility, driving east on Dunckel Road, and north on Collins Road. I then drove downwind, on Biotechnology Drive, up to several hundred feet northeast of the building. I still detected no odors. The time was 9:59 AM. Weather conditions were overcast and 61 degrees F, with winds out of the northeast.

I arrived at 10:01 AM. From the parking lot, I could see that there were no visible emissions from the tall exhaust stacks on the roofline of the building.

In the lobby, I left a voice mail message today for Mr. David Senyk. I also contacted the operator for

assistance, and was informed that Mr. Senyk left the company, some years ago. I was then assisted by Mr. Bernie Steele, who sought out the current facility environmental contacts. I was soon met by MBI's Mr. John Glassbrook, Bioprocess Equipment Design & Fabrication, and Mr. Tim Campbell, Project Manager - Bioprocess Operations. Mr. Campbell is the lead for the ammonia fiber expansion (AFEX) process, I was informed. Mr. Glassbrook explained he will soon be working for MSU's Bioeconomy Institute, but will still be available as a contact related to MBI.

I provided a copy of the DEQ brochure *Environmental Inspections: Rights and Responsibilities*, and a copy of the boiler NESHAP card, per AQD procedures. I also provided a copy of the DEQ's anhydrous ammonia tank brochure (attached for reference).

When I asked about any boilers at the site, I was informed that MBI once owned this building, but the MSU Foundation is the current owner, and they lease it from them. I was also informed that as of 4//2016, the building will be owned by MSU.

Note: some time after the inspection, I became aware of the existence of PTO No. 575-85, for oil and natural gas-fired boilers. I did not see these boilers during the inspection. The boilers were installed prior to the 1989 date of 40 CFR Part 60, Subpart Dc.

Inspection:

The ammonia tank is still in use, I was informed, but it is not used in the production of ethanol. It was explained that they use it for their ammonia fiber expansion (AFEX) project, to treat biomass. I was told that the previous inspection report, dated 11/13/2008, erroneously listed the anhydrous ammonia tank as a 1,200 gallon tank, when it is actually a 1,000 gallon tank. The permit application indicates that the capacity is 1,000 gallons.

Anhydrous ammonia tank, general PTI No. 127-07:

The tank was operating during the inspection. Compliance with the PTI's special conditions is described below.

Special Condition (SC) No. 1.1 requires the permittee to maintain onsite a copy of *Part 78, Storage and Handling of Anhydrous Ammonia* (MIOSHA 1910.111). I was informed that they are familiar with this document, and have a copy onsite. They were not able to locate it, spur of the moment, so I provided a spare copy.

SC No. 1.2 requires the inspection and maintenance program specified in Appendix A of the general PTI to be implemented and maintained. I was informed that Tanner, the company who owns the ammonia tank, and makes deliveries of anhydrous ammonia, handles the inspection and maintenance/upkeep of the tank, and all attached valves. I was given the contact name of Jeremy Johnson, from Tanner Industries, Inc.; the phone number 1-800-643-6226, and the following e-mail address: jjohnson@tannerind.com

SC No. 1.3 requires an emergency response plan to be approved by the local fire department or county emergency response agency, and to be implemented and maintained. The permittee is also required to review this plan with the local fire department or emergency response agency and make any necessary updates. There is such a plan, and it was approved by the local fire marshal and EPS construction engineer, I was informed. Whether or not the plan is reviewed each year was not immediately known. This was evidently handled by Mr. David Senyk, who is no longer with MBI. I was advised that they would check with Mr. Bernie Steele, who handles health and safety issues for MBI.

On 3/18, Mr. Campbell e-mailed me a copy of their emergency response plan, which is referred to as MBI's *Site-Specific Safety Plan* (please see plant file). This document is dated 2013. Mr. Campbell indicated that they have not been able to find records indicating that it has been reviewed annually with the local fire department or any other agency, since it was reviewed and implemented in March of 2013. This is a violation of SC No. 1.3, and a Violation Notice (VN) will be sent.

SC No. 1.4 requires that all transfer operations including transport deliveries are performed by a reliable person properly trained and made responsible for proper compliance with all applicable procedures. I was informed that they do not have transfer operations here, since unlike a farm, they are not transferring ammonia to portable tanks. For deliveries, I was informed that the tank's owner, Tanner Industries, handles delivery of anhydrous ammonia.

SC No. 1.5 states requirements for how close nurse and applicator storage tanks can be to residences, places of private or public assembly, schools, apartment buildings, institutions, hospitals, or nursing homes. MBI does not have applicator or nurse tanks or storage thereof, so this condition is non-applicable.

SC No. 1.6 requires that nurse tank filling shall only be done from a permanent stationary storage tank. MBI does not have nurse tanks, nor do they fill them, so this condition is non-applicable.

SC No. 1.7 states that nurse and applicator tanks shall be filled to no more than 85% of liquid capacity by volume. This does not appear to be applicable, as MBI does not fill nurse nor applicator tanks. The condition further states that storage tanks may be filled according to temperature density correction tables in Rule 7801(b)(11) where tanks have a thermometer well and suitable level gauge. I was advised to contact Tanner Industries, regarding this.

SC No. 1.8 states that vapor return lines shall be employed whenever necessary to ensure an accidental release from pressure relief valves will not occur during ammonia transfer operations. I was advised by MBI staff that Tanner Industries has a vapor return line.

SC No. 1.9 states that nitrogen stabilizer shall not be added to any permanent stationary storage tank or to rail or truck transport tanks. MBI does not add any nitrogen stabilizer, I was told. They did not believe Tanner Industries adds a nitrogen stabilizer, but advised checking with them.

I was advised that Tanner Industries has a certificate of analysis that the ammonia has no less than 0.5%, and greater than 0.3% water.

SC No. 1.10 requires that all containers shall be fitted with safety relief valves in accordance with Rule 7801(b)(9). The valves are required to be stamped with the date manufactured, and to be replaced, or retested and certified, at least every five years or more often, if there is evidence of danger or deterioration. I was advised to speak with Tanner Industries, on this.

SC No. 1.11 requires a remotely operated internal or positive shut-off valve to allow access for emergency shut-off of all flow from stationary containers. I was shown that there is a switch inside the building, for the remotely operated shut-off valve. The switch is not required by the general permit to be labeled, but it has been labeled "ammonia pump," since the 11/13/2008 AQD inspection. The valve is located outside the building, on the exterior of the tank.

SC No. 1.12 requires a bulkhead, anchorage, or equivalent system to be used at each transfer area so that any break resulting from a pull will occur at a predictable location while retaining intact the valves and piping on the plant side of the transfer area. MBI staff thought this condition might not apply, because they do not fill nurse tanks, and so there is no transfer area. I was told that the tank has stainless steel pipes and one stainless steel hose. I was advised to contact Tanner Industries, for further information.

The 11/13/2008 inspection report by AQD's Brian Culham states:

Because the MBI tank is small, only [1,000] gallons, it is not fitted with the large port used on agricultural supply mother tanks. There is no bulkhead installation either because the connection to the tank is similar to those on agricultural applicators or nurse tanks.

SC No. 1.13 requires that any liquid lines in rail and transport transfer areas be equipped with back pressure check valves and that all liquid lines not requiring a back check valve, and all vapor lines, be equipped with properly sized excess flow valves. These valves are required to be installed on the main

container side of the predictable break point at the bulkhead. MBI does not have any transport transfer areas, I was informed, as they do not transfer anhydrous ammonia to any other tanks, so this condition does not appear to be applicable. I was advised that there are excess flow valves, however, including one in the tank, on the vapor side.

SC No. 1.14: requires that all hoses be replaced five years after the date of manufacture, or more often, if there is evidence of damage or deterioration. I was informed that there are no rubber hoses here, because:

- they have a metal supply line, leading from the tank, into the MBI facility, and
- they have a single stainless steel hose, 1 foot in length, to protect plumbing downstream of the hose from pump vibrations.

SC No. 1.15 states that any vapor line, exclusive of couplings, *requiring venting* (emphasis added) after ammonia transfer be vented through a water trap of 55 gallons minimum size. Safety water is prohibited from being used for this purpose. In the 11/13/2008 inspection report by AQD's Brian Culham, he indicated that he did not believe these smaller lines required venting. B. Culham has since retired, but he was the AQD field contact for the agricultural source category (including anhydrous ammonia tanks).

My understanding is that Tanner Industries brings their own vapor line, with a portable water trap, when they make deliveries. I was informed that this portable trap may not be 55 gallons in size, but this does not appear to be a violation, because SC No. 1.15 does not appear to apply to this facility. I was later informed by AQD Permit Engineer Andrew Drury that a supplier bringing a small portable water trap is consistent with how deliveries are made to industrial users of ammonia (with appropriate anhydrous ammonia tank air permits tailored to the industrial nature of those sites).

SC No. 1.16 requires that a sign be present and conspicuously placed at the facility entrance, stating the emergency phone numbers for the owner, primary operator, local and state police, local fire department, and ambulance service. On an 8.5 by 11 inch sign, displayed inside the building, near the door closest to the ammonia tank, were the following emergency contact numbers:

- building owner,
- East Lansing Fire Department,
- MSU Police Department
- ambulance,
- Poison Control Center, and
- Director of Facilities.

The sign as it presently exists does not meet the intent of the permit condition. This will be cited in the VN, as a failure to have the sign conspicuously placed. There should be a sign outside the building, large enough, and far away from the tank enough, so that a person witnessing an anhydrous ammonia leak could read the emergency phone numbers from a safe distance. It may be advantageous to have a sign at the entrance to both driveways onsite; the driveway used for deliveries to the back of the building, and the driveway which leads to the front office.

SC No. 1.17 requires that EU-AMMONIA be located a minimum of 50 feet from the property line, 300 feet from any existing places of residence or private or public assembly, 500 feet from a school, apartment building, or institutional occupancy, and not less than 1,000 feet from a hospital or nursing home.

Based on satellite images, the tank appears to be about 600 feet from a university horse teaching facility, which is located northeast of MBI. This complies with the 500 foot setback requirement for schools. However, the tank appears to be only about 400 feet north of a Spring Arbor University building, which is located south of MBI. This is less than the 500 foot setback requirement from a school. The permit application, signed on 4/3/2007, stated that it was about 3,000 feet to the nearest school, apartment, or institutional occupancy. It is unknown if the Spring Arbor University structure had been built, at the time the application was submitted in 2007. It is also unknown if this is an actual school facility, or just an administrative office building. If MBI or current owner MSU wanted to install another anhydrous ammonia tank under the general PTI, it would be necessary to determine if this

building is an actual school.

There is a hotel, about 600 feet south of the anhydrous ammonia tank. If the hotel is considered to be a residence or place of private or public assembly, the tank complies with the 300 foot setback requirement. If the hotel is considered equivalent to an apartment building or place of institutional occupancy, the tank complies with the 500 foot setback requirement., in regard to this structure.

SC No. 1.18 requires the permittee to contact the Pollution Emergency Alert System (PEAS) telephone number (1-800-292-4706), or the AQD District Supervisor immediately, if there is an abnormal release. I was informed that Mr. Glassbrook and Mr. Campbell were not aware of any incident where there has been an abnormal release, but that I should also check with Tanner.

SC No. 1.19 requires the permittee to keep records of the date, duration, and description of any malfunction or spill occurring from EU-AMMONIA. I was informed that there have been no malfunctions or spills, to the knowledge of Mr. Glassbrook and Mr. Campbell.

SC No. 1.20 requires the permittee to keep, in a satisfactory manner, records of the annual review and approval of the emergency response plan with the local fire department. In an e-mail on 3/21/2016, Mr. Campbell indicated that they had been unable to locate any records documenting annual review of the plan with the local fire department or any other agency, since initial review and implementation in March, 2013. This constitutes a violation of SC No. 1.20. A VN will be sent.

SC No. 1.21 prohibits the permittee from replacing or modifying any portion of EU_AMMONIA, or installing new equipment, unless conditions (a), (b), and (c) are all met. The three conditions require that the general permit be updated, that the permittee continue to meet all applicability criteria, and that the permittee keep records of the date and description of any replacement, modification or installation of new equipment. I was informed that the tank and portions of the tank have not been replaced. I considered that the required replacement of valves under the PTI would not trigger this requirement.

We observed the tank, during the course of the inspection. It was pointed out to me that the vapor service valve was unlocked, and the tank was in use, right now. I did not detect any odors, nor any visible emissions, from the tank. I observed an excess flow valve, identified as 7802. There was also a level indicator, for the tank. The emergency contact information for Tanner Industries was displayed on the tank itself.

There were two pressure relief valves on the tank, each labeled as expiring in May of 2017 (5/17). I was informed that they follow a requirement to swap these back and forth every month. A hydrostatic valve was expires and needs to be replaced in April 2017, I was informed, because of writing on the tank ("4-17").

The tank is protected by metal poles or "truck guards," to prevent damage. It is located close to an exterior wall of the building. I was informed that the stainless steel lines coming from the tank have air actuated valves, and that the valves would automatically be "fail closed," if anything happened to the air supply.

There is an ammonia sensor on the wall over the storage tank. I was informed that it will alarm at 30 parts per million of ammonia in the air, the SEL for exposure to ammonia. I was told it is calibrated twice per year. It was explained that there is also a sensor in the line leading into the building, and several sensors inside the building itself. Some of the indoor sensors are at points of use, I was told. I observed an ammonia monitoring system, which, I was informed pulls in air from 8 points within the building. Additionally, I was told that a sensor being set off sends a signal throughout the building, as well as the fire department, police department, and MSU Environmental, Health & Safety.

Ammonia Capture System (scrubber), Rule 283(1)(a)(viii):

The PTI application identifies the Ammonia Capture System as a countercurrent packed column ammonia absorber for liquid and/or gaseous ammonia. It may also be described as a scrubber. It was described in the PTI application, but as the general PTI does not address such a device, it could be

consider exempt under Rule 283(1)(a)(viii), per B. Culham's 11/13/2008 inspection activity report. The scrubber is used to control emissions from the AFEX process.

The scrubber was operating during the inspection. I did not see any visible emissions from the unit. I was informed that water recirculates within the unit, and citric acid is automatically added, to keep the pH below 5. It was explained that air is exhausted outside, while ammonia is reabsorbed. I was shown the holding tank where liquid from the scrubber goes. I was advised that the pH is checked, before any liquid is released to the sewer. The pH monitor for the waste liquid indicated 5.49 right now, and I was advised the allowable range for this is 5-9, for disposing of the liquid in the sewer.

Conclusion:

The facility was orderly and immaculately clean, in appearance. The two instances of noncompliance with PTI No. 127-07 were:

- a lack of records to verify that the emergency response plan (MBI's Site-Specific Safety Plan) has been annually reviewed with the local fire department or emergency response agency.
- the sign with emergency phone numbers not being large enough, nor located in such a location, so as to be "conspicuously placed."

A VN was sent on 6/7/2016, to document the above violations, and to require a corrective action program. It may be helpful to coordinate future inspections with Tanner Industries, Inc., the supplier of the anhydrous ammonia, as they play a major role in the operation and maintenance of this tank

NAME



DATE

6/9/2016

SUPERVISOR



