

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

B287661118

FACILITY: Michigan Sugar Company, Croswell Factory		SRN / ID: B2876
LOCATION: 159 S Howard Ave, CROSWELL		DISTRICT: Bay City
CITY: CROSWELL		COUNTY: SANILAC
CONTACT: Meaghan Martuch, Air Compliance Manager		ACTIVITY DATE: 11/24/2021
STAFF: Benjamin Witkopp	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Facility Inspection		
RESOLVED COMPLAINTS:		

Ben Witkopp of the Michigan Department of Environment Great Lakes and Energy - Air Quality Division (AQD) conducted an inspection of the Michigan Sugar Company (MSC) facility located at 159 S. Howard Ave in Croswell Michigan. The facility is covered by renewable operating permit (ROP) MI-ROP-B2876-2019a. Though the facility was inspected the previous year, AQD management wanted to break up inspection timeframes so MSCs four factories weren't all inspected in one year. Meaghan Martuch is MSC's Air Compliance Manager. She is relatively new to MSC. Steve Smock, the previous environmental contact is no longer with the company. Also present was Dave Tait, the factory chemist.

The facility extracts sugar produced by sugar beets. The primary product is granulated sugar. Other products produced at the facility consist of beet pulp (pressed, as well as dried and pelletized) sold as animal feed and spent lime which is sold for use as soil enhancement.

The plant operations are truly seasonal with the production time called campaigns. Campaigns may start in mid to late August but typically ramp up in September and run through February and possibly March. The juice campaign continues after the beet slicing is done and usually lasts for another month or so. Packaging operations are run on an as needed basis and can occur at any point in the year. This year the beet harvest yield has been record shattering.

The most significant change to the facility has been the demolition of the existing original lime kilns when the previous campaign ended. They have been replaced with a new gas fired kiln manufactured in Germany. The new unit was installed between campaigns. The use of a gas fired kiln should facilitate startup and shutdown as well as better handle factory needs / swings.

Process steam is provided by two boilers. The Riley boiler is natural gas fired and was relocated from the company's Carrolton site. It is also known as boiler 4. The control system incorporates oxygen trim. The boiler is equipped with a continuous emissions monitoring system (CEMS) for NOx and O2. The Murray boiler is capable of burning fuel oil or natural gas though fuel oil has reportedly not been used. It is also known as boiler 3.

PULP DRYER

Though a variety of records are required by the conditions in the ROP a concerted effort was made to check the records of the pulp dryer operation due to the problems with them in the past. The company has a demand for pressed pulp due to the number of large scale dairy operations in the area. However, pressed pulp begins deteriorating in warm weather conditions and can not be stored for very long. If the pressed pulp isn't needed it is routed to the pulp dryer and the material can eventually be pelletized. In an interesting turn of events, the pulp dryer was not used in the early part of this campaign. Due to the record shattering beet harvest, the company was nearly giving away pressed pulp therefore the dryer was not used until October 2021 according to Dave.

I inquired about the status of the flue gas recirculation system as its use was deemed inconsequential during past engineering testing. Dave confirmed it was no longer in use and had been permanently disconnected. That left pressure drop across the multiclone as the parameter being monitored. The pressure drop range specified in the Compliance Assurance Monitoring (CAM) plan was two to eight inches of water. Records for this campaign were checked. Beet slice rate was around 200 tons per hour or less. The records showed the pressure drop was typically two to three inches of water. The pressure drop was outside the range on the low end a couple of times. On November 5, 2021 they recalibrated the pressure drop gauge due to a startup. When it still read below two inches it was

replaced. The records were far better than in the past. Dave said he has also made it a point to check the records each day for any potential issues. Dave confirmed that though the pulp dryer is capable of burning oil, and oil is still on site, the plumbing, valves, and controls have been removed.

During the factory tour, the pulp dryer was found to have been going into shutdown mode. The daily records being kept by the operator showed the pressure drop across the multiclone were running in the typical two to three inches of water. Since pulp was no longer being dried, the pelletizing operations were also not operating.

MURRAY BOILER

The Murray boiler has a requirement to track fuel use which then correlates to NOx. The natural gas limit is 372 MMCF. Records showed only 115,279 MMCF thus far. There is also an operational limit on the amount of steam produced. The limit is 67,500 pounds of steam per hour. The highest amount was 49,486 pounds per hour. Dave noted that was during boiler tuning. The value was typically in the mid 20,000 to mid 30,000 pounds of steam. Though the boiler is capable of burning oil, and oil is still on site, Dave confirmed the plumbing, valves, and controls have been removed. The boiler was not operating at the time of the factory tour.

The unit is subject to Maximum Available Control Technology (MACT) regulations for boilers subpart DDDDD. The boiler is part of the flexible group for the MACT. Records were requested to show when the last MACT performance testing was done. The records were provided later. The report showed the date as January 28, 2021. Since the unit is not equipped with O2 trim the unit would be considered as requiring annual testing. This was confirmed by Terry Duvall of the boiler testing firm AI2.

RILEY BOILER

The records for the Riley boiler had a high steam production rate of 119,407 pounds per hour. There is no limit directly specified. There are several emission limits on a 12 month rolling time period. Records were not available at the time, were requested, and received at a later date.

At the time of the factory tour, the Riley boiler was producing steam at the rate of about 92,650 pounds per hr. The factory slice rate was 236 tons per hour. The CEMs was checked for values both at one min and one hr avg.

	min	hr
NOx ppm	61.5	60.6
CO ppm	29.3	29
O2%	5.5	5.3
mmbtu	123.3	128.7
NOx / mmbtu	0.084	0.084
CO / mmbtu	0.023	0.025
NO lb/ hr	10.4	10.8
CO lb/hr	2.8	3.2

The NOx limit is 86.24 tpy while records showed the highest value to be 30.32 tpy. The limit for PM is 1.46 tpy. Records revealed 0.55 tpy. PM10 is limited to 5.84 tpy and the records had 2.18 tpy emitted. GHGs as CO2e have a limit of 92,428 tpy. Records showed the emission of only 65 tpy and that was the highest value reported. That value is very questionable given the use of 574 MMCF of natural gas and the emission factor for just carbon dioxide (CO2) is 120,000 pounds per MMCF. This was pointed out to Meaghan. She re-checked her calculations and said the 65 TPY is correct. This is concerning for the record keeping aspect though the correct values do not indicate an emission limit violation.

The Riley boiler PM records are reportedly based on the use of AP-42 factors as provided below the ROP emission limit table. There is some question if the factors presented are appropriate because the PM10 factor of 7.6 lb/MMscf is far higher than the PM factor of 1.9 lb/MMscf. It should be noted the AP42 factors for source classification code (SCC) 1-02-006-01 have footnotes for the use of the various PM related emission factors. The actual permit to install (PTI 21-15B) issued for the Riley Boiler was checked to make sure there was not a transcriptional error in play. The factors found in the ROP are at least the same as those in the PTI. The PM factor listed in the permit is for PM (filterable) though the permit does not provide the delineation. The factor provided for PM10 is actually for PM (Total) which does not appear consistent with the footnotes found in AP-42. This will be brought to the attention of the AQD permit section.

The boiler is subject to New Source Performance Standard (NSPS) Db. The basic requirement at this stage is the calculation of the boilers capacity factor. It should be noted ROP condition VI 4 specifies the calculation of the capacity factor on a 12 month rolling basis. The condition does not use the term "average." Average is used in the actual NSPS Db record keeping requirements. The records provided later did not have the term "average" in the title as would be expected given the ROP condition. Meaghan confirmed the values provided were not an average. The highest capacity factor was 0.46 or 46%. The situation will be brought to the attention of the AQD permit section for presumably an administrative change.

The boiler is also subject to the MACT regulations for boilers subpart DDDDD. The boiler is part of the flexible group for the MACT. The basic remaining requirement at this point is conducting either an annual performance tune-up or a five year performance tune-up. Records provided for the Riley boiler indicated the five year performance test had been conducted on September 11, 2019. However, the report indicated the next testing would be slated to occur in 2025, which would actually be six years. That was clearly in question as the next test should be conducted no more than 61 months after the tune-up. Therefore, the next tune up / testing should be conducted in 2024. This was pointed out to the company and the testing firm AI2. The correct year being 2024 was confirmed by Terry Duvall of the boiler testing firm AI2 and shared with the company.

LIME KILN

The lime kiln is a new natural gas fired unit which replaced the two kilns original to the facility. The basic requirements are a limit on the amount of limestone fed to the kiln and the amount of direct venting to atmosphere. The limits are 91,250 tons per year and 720 hours per year respectively. Since the kiln is new, the only amounts of interest are from the current campaign. A total of 26,673 tons of limestone had been used thus far. When checking the kiln for visible emissions Dave also notes the approximate amount of opening for direct venting that the kiln has at the time. That amount can change at any point though it at least confirms direct venting was occurring. Dave said their internal system keeps track of the exact point when valves open and close. Therefore, the time of direct venting can be determined. The records were requested and provided at a later date. A total of 606 hours of direct venting occurred thus far which was below the limit of 720. No visible emissions were observed during direct venting.

FGRULE290

The pellet mill and pellet cooler are found within the flexible group. They seem to fit best under the conditions of section I (3) for noncacinogenic particulate air contaminants. The equipment is controlled by bag houses. The processes do not have emission limits per se. Records were requested for the actual emissions since they would eventually be used for the Michigan Air Emissions Reporting System (MAERS). The records were provided at a later date. Though the records were suspect looking at first glance, one needs to keep in mind the production of pellets ebbs and flows with demand. That being said, one wonders why the pellet mill values steadily increase while the cooler values fluctuate up and down significantly.

FGSUGAR

FGSUGAR consists of the dryer, cooler, and transport. Each has a PM and PM 10 limit. The limits were 29.57 and 26.61 tons respectively for the dryer. The limits for the cooler were 2.76 and 2.48 tons for

PM and PM10 respectively. Lastly transport has limits of 1.18 tons PM and 1.06 tons PM10. It should be noted the items in FGSUGAR would typically be exempt but had to be included in the 21-15 pti series due to netting when the Riley boiler was being brought to the site.

The cooler has been changed to a liquid to solid plate means to perform cooling which has eliminated air (and emissions) from the cooler. I asked Meaghan to provide a block flow diagram to confirm. The diagram was provided at a later date and confirmed.

Ventilation pickup points were added outside of the cooler but realistically they fit best under the sugar transport category. Therefore, the company should determine the new total airflow rates used in transport because airflow is used in the emission calculations.

Records were requested and provided at a later date. The fact that emission values were even being shown for the sugar cooler, when it in fact has no air being used for cooling, indicates the company has not taken into account the status of its current operations. It also raises the question if any of the airflows for the dryer and transport have been checked at all let alone properly used in the emissions calculations.

Based solely on the emissions records supplied by the company indicated the dryer had a high of 18.51 tons of PM and 16.66 tons of PM10 which are below the respective limits. The cooler had a high of 1.73 tons of PM and 1.55 tons of PM10 which are below the respective limits. Lastly, the transport had emissions of 0.93 tons of PM and 0.84 tons of PM10. The emissions from transport are below limits.

CONCLUSION

There were no emission limit violations or installations of unpermitted equipment noted as a result of the inspection.

CONCERNS - RECORDKEEPING

FGSUGAR - records were being kept and emissions were being calculated for the sugar cooler. The sugar cooler no longer uses air to cool sugar and in fact it has been this way for some time. The company has not taken into account the status of its operations. It also raises the question if any of the airflows for the dryer and transport have been checked at all let alone properly used in the emissions calculations.

RILEY BOILER - GHGs as CO₂e have a limit of 92,428 tpy. Records showed the emission of only 65 tpy and that was the highest value reported. The reported value is very questionable given the use of 574 MMCF of natural gas and the emission factor for just carbon dioxide (CO₂) is 120,000 pounds per MMCF. This was pointed out to the company. The calculations were re-checked by the company with the result being the 65 TPY is correct. Taking into account just the CO₂, and using the information provided above, actually yields 34,440 TPY.

NAME B. Z. [Signature]

DATE 12/21/2021

SUPERVISOR Chris Hare