

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

B149366362

<b>FACILITY:</b> Michigan Sugar Company - Bay City		<b>SRN / ID:</b> B1493
<b>LOCATION:</b> 2600 S Euclid Ave, BAY CITY		<b>DISTRICT:</b> Bay City
<b>CITY:</b> BAY CITY		<b>COUNTY:</b> BAY
<b>CONTACT:</b> Angel Pichla , Environmental Superintendent		<b>ACTIVITY DATE:</b> 02/10/2023
<b>STAFF:</b> Kathy Brewer	<b>COMPLIANCE STATUS:</b> Non Compliance	<b>SOURCE CLASS:</b> MAJOR
<b>SUBJECT:</b> MSC BC ROP on site records, monitoring and control device review. VN previously sent (VN#2 Nov 14, 2022) for CEMS noncompliance issues and certification of inaccurate reports is now in escalated enforcement. Overall on site compliance management, tracking, and verification needs improvement.		
<b>RESOLVED COMPLAINTS:</b>		

**AQD staff (KLB) conducted a site investigation at the Michigan Sugar Company (MSC) Bay City facility. Angel Pichla of MSC participated in the site inspection and records review.**

**MSC was issued ROP MI-ROP-B1493-2021 on November 4, 2021.**

**EUBOILER8 and FGBOILERS (EUBOILER#6 and EUBOILER#7) at the stationary source are subject to the Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units promulgated in 40 CFR Part 60, Subparts A and Db.**

**EUPELLETPRDCNT is subject to 40 CFR Part 64 Compliance Assurance Monitoring (CAM) requirements due to particulate matter emissions.**

**Consent Judgement No. 17-000727-CE (CJ) was entered on December 28, 2018, to resolve claims in a complaint filed against Michigan Sugar Company that, in part, alleges violations of Rule 901 of the Michigan Air Pollution Control Rules regarding odors emitted from the Bay City Factory. EGLE has sent MSC a demand for stipulated penalties for violations of the Consent Judgement. EGLE and MSC are in informal dispute resolution discussions.**

**Stationary source emission information as reported to the Michigan Air Emissions Reporting System (MAERS) for the year 2021 were the following**

Pollutant	Tons per Year
<b>Carbon Monoxide (CO)</b>	<b>49</b>
<b>Lead (Pb)</b>	<b>0.00053</b>
<b>Nitrogen Oxides (NO<sub>x</sub>)</b>	<b>86</b>
<b>Particulate Matter (PM)</b>	<b>59</b>
<b>Sulfur Dioxide (SO<sub>2</sub>)</b>	<b>2</b>

Pollutant	Tons per Year
Volatile Organic Compounds (VOCs)	6

In addition to the Molasses desugarization process and the Odor- Neutralization process using Rule 290 air permitting exemptions, the facility has several Part 55, Rule 201 permit exempt processes.

PTI Exempt Emission Unit ID	Description of PTI Exempt Emission Unit	Rule 212(4) Citation	PTI Exemption Rule Citation
EUPOWDERED SUGAR	Powdered sugar is milled and packaged in this area.	Rule 214(4)(e)	R 282(dd)
EUSUGARCOOLING	In this area, the dried sugar is cooled and then transported to sugar packing or storage.	Rule 214(4)(e)	R 282(dd)
EUSUGARDRYING	Crystallized sugar is dried in sugar dryers. This group includes a "wet box room" where wet sugar is stored before drying, granulators, and dryers.	Rule 214(4)(e)	R 282(dd)
EUSUGARPACKING	This group consists of the vacuum system used to collect spilled sugar from the packing room, warehouse, and Silo#1.	Rule 214(4)(e)	R 282(dd)
EUSPACEHTRS	32 Natural gas fired space heaters. All heaters are 5 MMBTU/hr or less	Rule 214(4)(c)	Rule 282(b)(i)
EUSUMBLR	14 MMBTU/hr natural gas fired boiler installed prior to 1967. Has not operated for many years	Rule 214(4)(c)	Rule 282(b)(i)

The site also has a Source Wide requirement for a Fugitive Dust Plan.

During the inspection we viewed emission units and air pollution controls in the ROP. Monitors, operations screens, and on-site records were also reviewed. MSC staff did provide the information requested during the inspection.

MSC has had several Compliance Emission Monitoring (CEMs) violations and inadequacies noted in Violation Notices sent to the facility and in recent ROP Deviation Reports. A VN was sent to the company on July 18, 2022, a second VN was sent on November 15, 2022. The violations were referred for escalated enforcement for CEMS non-compliance. A meeting between EGLE and MSC BC was held on February 13, 2023. The non-compliance cited in the VNs remain unresolved.

At the time of the inspection MSC was not in compliance with the requirements in the federal Clean Air Act; Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451); the Air Pollution Control Rules, and the conditions of Renewable Operating Permit MI-ROP-B1493-2021

### **Records Reviewed**

**Calcium chloride application 2021 & 2022**

**Daily dust suppressant log August 2021- November 2021**

**Dust complaint log 2021-2022**

**Boiler#8, FGBOILERS December 2021, February 2022**

- NOx, CO emissions
- Heat input, Heat ratios

### **BOILER#8**

- MAP
- Tune-up records
- Inter-campaign burner visual inspection
- SSM Plan
- CO Minimization Plan

### **Lime kiln analytical**

- 4/26/2021 Coal composite, Coke composite Analytical report
- 11/5/2021 Coal composite, Coke composite Analytical report

**Digester H2S emissions December 2021, February & October 2022**

**Digester 2021 relief valve inspection**

**Cooling tower December 2021, February & October 2022**

- hours of operation
- flow rates
- 30 day rolling emissions

**ROP Deviation Reports Sept. 2021, March & Sept 2022, March 2023**

**Molasses Desuagrization 2022 R290 demonstration**

**OMI R290 demonstration, 2020 emission estimates**

## Site Description

MSC is primarily engaged in the production of sugar from sugar beets. The facility operations are seasonal and a campaign typically runs from September through March. Byproducts include concentrated molasses solids that are used as cattle feed and spent sugar beet lime that is sold/used as a soil enhancement/supplement. Other products resulting from this location include betaine.

Sugar beet processing operations comprise several steps including cleaning, washing, slicing, diffusion, juice purification using milk of lime, evaporation, crystallization, and sugar recovery from molasses. Equipment used to accomplish these process steps consists of beet pilers, beet slicers, diffusion towers, lime kiln/auxiliary equipment, carbonators, filters, evaporators, vacuum pans, and packaging equipment. In addition, the facility utilizes a molasses desugarization process for additional sucrose recovery and generation of additional products.

## Source Wide Fugitive Dust Plan Compliance

SC VI.1 requires MSC to maintain dust complaint logs, daily logs of dust suppressant applications and paved area sweeping. The current Fugitive Dust Plan was received in March of 2020

- Chloride application records were provided for April 30, 2021 and September 7, 2022
- Two dust complaints were received in 2021 (September 5 and September 27)
- Street sweeping is submitted to the Agriculture Group who provide a weekly report to the Environmental staff. Water application logs were provided for August 5, through November 7, 2021. The water truck logs include which zones have water applied. Zone 1 lime pile, Zone 2 piling grounds east side Columbia drain, Zone 3 piling grounds west side Columbia drain.

All records appeared to be maintained adequately and were available for review.

## EUBOILER#8 Non-compliance

The Boiler#8 was purchased and installed in the summer of 2012. Boiler #8 is a 243 MMBtu/hr natural gas fired boiler that is subject to NSPS 40 CFR Part 60 Subpart Db. The ROP establishes emission limits for NO<sub>x</sub>, CO, and PM 2.5, and requires the proper operation of the flue gas recirculation system. A MAP, SSM Plan, and a CO emission Minimization Plan are required.

Boiler #8 has NO<sub>x</sub> and O<sub>2</sub>(CO) CEMs requirements. The ROP contains the NSPS emission limit for NO<sub>x</sub> of 0.2 lbs/MMBtu, and additional NO<sub>x</sub> emission limits of 0.09 lbs/MMBtu, 21 pph, and 76.1 TPY 12 month rolling average. Boiler#8 CO emission limits are 0.08 lb/MMBTU and 20 pph. The CEMS data provided and reviewed for December 2021, February 2022 and October 2022 indicates compliance with all NO<sub>x</sub> and CO emissions limits (attached). However, MSC has not properly maintained and operated the CEMS and the data indicating compliance with emission limits has several periods of unacceptable quality assurance due to failed calibrations and equipment failures.

The required MAP for Boiler#8 was reviewed. The most recent previously approved MAP is dated November 11, 2015. Inter-campaign visual inspections have been conducted. A July 2022 boiler inspection, and a combustion setup/tuning inspection based on MACT requirements was conducted on January 22 & 23, 2020. (attached). The MAP states NO<sub>x</sub> CEMS and O<sub>2</sub> monitors are listed as primary indicators of unsatisfactory operation.

CO Minimization Plan originally submitted in March 2015 was modified and submitted in March 2020 with the ROP Renewal application. The CO Minimization Plan states that annual RATAs and quarterly Cylinder Gas Audits (CGA) are to be conducted to ensure the proper operation of the NOx and O2 CEMs monitoring equipment.

SSM Plan is from March 2020 and submitted with the ROP Renewal application.

The ROP requires the continuous monitoring and recording of NOx and O2 or CO emissions. The facility utilizes NOx and O2 CEMS. Calculation and records of hourly, 30 day rolling and 12-month rolling emissions and natural gas usage are required. December 2021, February 2022 and October 2022 records were reviewed.

Parameter Boiler#8	December 31, 2021	February 28, 2022	October 31, 2022
Heat input 12 month rolling	4565 MCF/day	3848 MCF/day	4130 MCF/day
Heat Input Ratio	0.572 BTU	0.548 BTU	0.599 BTU
NOx 30 Day rolling (0.09 lb/MMBTU limit)	0.042 lb/MMBTU	0.05 lb/MMBTU	0.045 lb/MMBTU
NOx Hourly lb/hr (21.9 lb.hr limit)	8.44	8.5	8.08
12 month rolling NOx (21.9 TPY limit)	8.44	14.31	19.68
Hourly CO (20 lb/hr limit)	15.98	13.47	14.46
Hourly CO (0.08 lb/MMBTU limit)	0.08	0.08	0.08

#### **EULIMEKILN: In compliance**

The lime kiln is used to generate lime and CO2 for the sugar making process.

The lime kiln is permitted to be fired on either coke or anthracite coal. Limestone and coke/coal are loaded together into the top of the kiln through a double gate door. The fir

zone in the kiln is controlled by a double damper system at the top of the kiln. The baked limestone is removed from the bottom of the kiln and the CO<sub>2</sub> is removed from the top of the kiln.

The ROP limits the sulfur dioxide and PM emissions. MSC provided records of the daily and 12 month rolling coke and limestone usage.

	December 31, 2021	October 31, 2022	December 31, 2022
Total Lime Rock (Ton/day)	328.29	321.61	
Total Lime Rock (Ton for Month)	10994.99	9925.28	9861.73
Total Coke (Ton/day)	0	0	0
Total Coke (Ton for Month)	0	0	0
Total Coal (Ton/day)			
Total Coal (Ton for Month)	822.39	748.72	712.87

Analytical results from anthracite coal and from coke composite samples taken April 28, 2021 were provided.

Fuel	BTU/lb (calculated)	%Sulfur
Anthracite Coal	14,936	0.87
Coke	13,990	0.73

The records provided indicate compliance with the ROP requirements.

The facility performed daily .VE readings between August 25 and September 1, 2022 during Lime kiln startup while venting to atmosphere. The VE survey log is attached. No VEs were observed during the observations.

**EUPELLETPRODUCTION: Compliance**

The pulp that is dried is sent to the pellet production process. This area consists of pell mills, pellet coolers and associated conveyors. Each cooler and the conveyors are controlled by cyclones that vent to the wet scrubber. The pellet production emission unit is subject to 40 CFR Part 64 subject due to particulate matter emissions

At the time of the inspection, the scrubber was operating at a pressure drop of 2.5 inches of water. There is a requirement to maintain an audible alarm on the wet scrubber to monitor flow to the scrubber and periodically test the alarm. According to MSC, the Maintenance Dept. has a standing work order to test the alarm annually and whenever the scrubber is down for maintenance.

The operators record the pressure drop across the scrubber once per shift on a log. The log sheets were maintained in good order, complete and up to date. Daily log sheets reviewed from January 30 thru February 22, 2022 indicate the differential pressure of the pressure drop across the scrubber was between 4.1 " to 6.5 " dP. The CAM indicator range is 2" to 10" water column.

The liquid flow rate through the scrubber was monitored once each shift. The range of flow was 9 to 19 gpm.

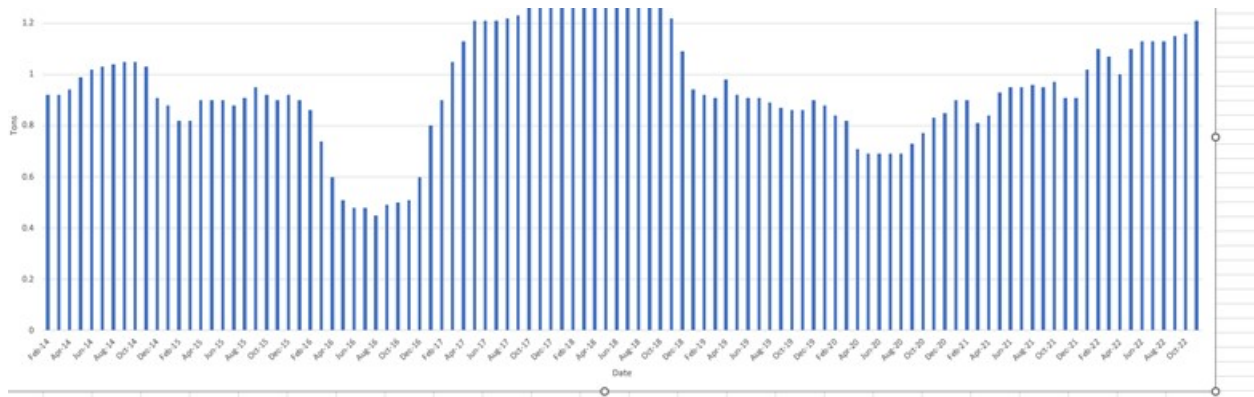
**EUANAEROBICDIGESTER: Compliance**

The wastewater treatment system includes an anaerobic digester with a flare. The high strength wastewater from the process is directed to the anaerobic digester. H<sub>2</sub>S generated by the digester is vented to the flare.

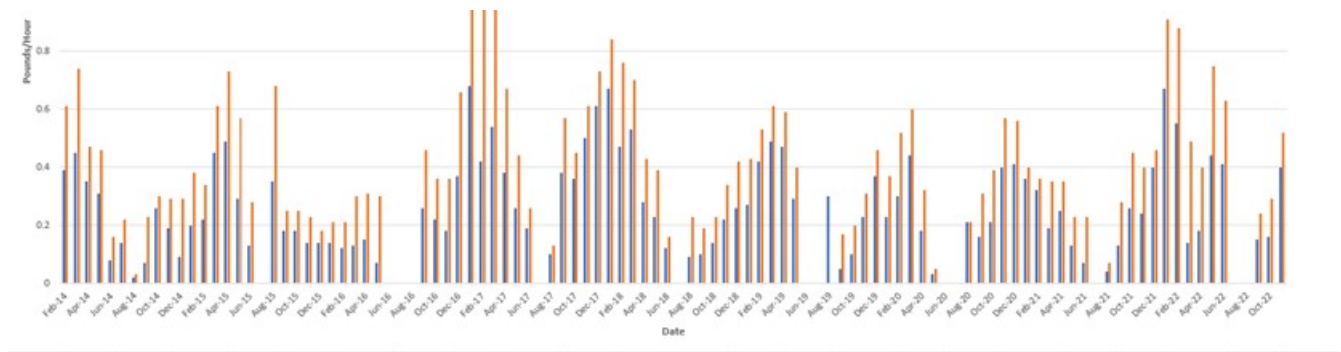
MSC monitors on a daily basis the mass flow of methane gas and hydrogen sulfide gas going to the flare. MSC submits a monthly report of the gas flow and SO<sub>2</sub> emissions. The monthly report is required to include the mass flow rate of hydrogen sulfide going to the flare.

Month	SO <sub>2</sub> gas 12 month rolling total (36.16 TPY Limit)	Daily H <sub>2</sub> S flow	Ft <sup>3</sup> /day
December 2021	0.91 TPY	12/1/2021	216,000
February 2022	1.09 TPY	2/1/2022	596,160
October 2022	1.16 TPY	10/1/2022	96,480

**12 Month rolling SO<sub>2</sub> values reported**



### Pound per hour SO2 values reported



Review of reports indicate the facility is in compliance with H2S emission limits.

A record of the anaerobic digester pressure relief valve inspection completed on November 2, 2021 is attached.

### EUCOOLINGTOWER: In compliance

MSC operates a barometric condensing cooling tower. This is used to cool process waters entering the water treatment system. The ROP requires monitoring of the discharge flow and ammonia concentrations three times per week. MSC provided weekly records of the pump flows and ammonia concentration from samples taken three times each week. This data is used to calculate a monthly maximum ammonia emission and a monthly average ammonia emission.

MSC provided records that demonstrate compliance with the conditions of the ROP. The monthly maximum concentration of ammonia in records reviewed was 60 ppm and the maximum hourly emission rate was 310 pph. The maximum 30 day rolling emission rate was 266 pph. The permit limit is 920 pph.

### FGBOILERS: Non compliance

FGBOILERS covers the two 180 MMBtu/hr natural gas fired boilers (#6 and #7) with low NOx burners and flue gas recirculation. These boilers are also subject to NSPS 40 CFR Part 60 Subpart Db. The ROP establishes emission limits for NOx and CO and requires the proper operation of the flue gas recirculation system.



Boilers #6 and #7 each have a NO<sub>x</sub> CEMs as required by NSPS Db. The NSPS establishes an emission limit for NO<sub>x</sub> of 0.2 lbs/MMBtu, but the ROP establishes a limit of 0.155 lbs/MMBtu. The CEMS data provided and reviewed for December 2021, February 2022 and October 2022 indicates compliance with all NO<sub>x</sub> and CO emissions limits (attached). However, MSC has not properly maintained and operated the CEMS and the data indicating compliance with emission limits has several periods of unacceptable quality assurance due to failed calibrations and equipment failures.

Records reviewed had actual heat input ratio for boiler #6 and boiler #7 are less than the required 0.5.

Parameter Boiler#6	December 31, 2021	February 28, 2022	October 31, 2022
Heat input 12 month rolling	2106 MCF/day	2489 MCF/day	2061 MCF/day
Heat Input Ratio	0.416 BTU	0.428 BTU	0.411 BTU
NO <sub>x</sub> 30 Day rolling (0.2 lb/MMBTU limit)	Not reviewed	Not reviewed	Not reviewed
NO <sub>x</sub> 24 hour average (0.155 lb/MMBTU)	0.088	0.088	0.083
NO <sub>x</sub> Hourly lb/hr (27.9 lb.hr limit)	7.37	9.62	7.45
12 month rolling NO <sub>x</sub> (61.1 TPY limit)	26.44	5.75	21.31
Hourly CO (0.22 8 hour lb/MMBTU limit)		0.088	
Hourly CO (39.6 lb/hr limit)	7.37	8.71	7.21
CO 86.7 TPY limit	26.08	5.64	20.58

Parameter Boiler#7	December 31, 2021	February 28, 2022	October 31, 2022
Heat input 12 month rolling	2182 MCF/day	2595 MCF/day	2170 MCF/day
Heat Input Ratio	0.429 BTU	0.442 BTU	0.459 BTU
NOx 30 Day rolling (0.2 lb/MMBTU limit)	Not reviewed	Not reviewed	Not reviewed
NOx 24 hour average (0.155 lb/MMBTU)	0.108	0.12	0.10
NOx Hourly lb/hr (27.9 lb.hr limit)	10.35	13.61	9.49
12 month rolling NOx (61.1 TPY limit)	26.44	5.75	21.31
Hourly CO (0.22 8 hour lb/MMBTU limit)	0.088	0.088	0.088
Hourly CO (39.6 lb/hr limit)	7.64	9.08	7.6
CO 86.7 TPY limit	26.88	5.88	23.29

#### **Miscellaneous Exempt Equipment: In compliance**

As discussed above a large portion of the process equipment is exempt from permitting. The molasses desugarization process is exempt under R290. In 2004, MSC submitted documentation of the emissions from the molasses desugarization process and demonstrated that the VOC emissions are less than 1 tpy.

The site is in the process of building an additional molasses desugarization plant. The facility is also claiming an air permit exemption per Rule 290 for the new molasses desugarization plant. Attached is the January 2022 Air Permitting Exemption Evaluation for the molasses desugarization process report by Environmental Partners Inc. (EPI). Using a maximum raffinate (CMS) throughput of 1730 tons/day the VOC estimated emissions rates are 12lbs/month and 143 lbs/year.

Table 3 of the EPI report estimates that the combined VOC emissions from both molass desugarization processes will be 24.25 lbs/month and 285.6 lbs/year

The site operates an odor neutralization system "OMI". The Rule 290 determination documentation was provided. OMI application rates in gal/day are tracked daily. Hydriiv: 2000 is used in both the Odor Boss and OMI. 2020 records reviewed indicate the emissions were 36% of allowed.

NAME 

DATE 10/2/2023

SUPERVISOR 