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

B488548034

FACILITY: TILDEN MINING COMPANY LC		**SRN / ID:** B4885
LOCATION: 1 TILDEN MINE ROAD, ISHPEMING		**DISTRICT:** Upper Peninsula
CITY: ISHPEMING		**COUNTY:** MARQUETTE
CONTACT: THOMAS W O'BRIEN , ENVIRONMENTAL ENGINEER		**ACTIVITY DATE:** 08/22/2019
STAFF: Joe Scanlan	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Inspection and file review to determine compliance with MI-ROP-B4885-2017A		
RESOLVED COMPLAINTS:		

FACILITY DESCRIPTION

Cliffs Natural Resources Inc. (Cliffs) owns two existing iron ore mines located in the geologic formation known as the Marquette Iron Range: the Empire Iron Mining Partnership (Empire) and the Tilden Mining Company LLC (Tilden). The mines and associated ore processing equipment are in Tilden and Richmond Townships, Marquette County, southeast of the City of Ishpeming (pop. 6,470). The unincorporated communities of Palmer (pop. 449) adjacent to Empire, directly to the east.

From a regulatory perspective, Tilden and Empire are one stationary source per Prevention of Significant Deterioration (PSD) regulations, however Tilden and Empire currently have separate Title V permits. Tilden's current Title V permit (MI-ROP-B4885-2017A) was issued on August 14, 2018.

The facility is subject to 40 CFR 63 Subpart RRRRR (Taconite MACT) which was issued to reduce emissions of toxic air pollutants from taconite ore processing facilities. FGDUSTCOLLECTORS, EUOREDRYER1, EUOREDRYER2, EUKILN1 and EUKILN2 are regulated under FGTACONITEMACT. A taconite ore processing facility separates and concentrates iron ore from taconite, a low-grade iron ore, and produces taconite pellets, which are approximately 60% iron. Tilden is an open-pit truck and shovel iron ore mine and taconite ore processing facility employing various material handling, crushing, milling, concentrating, ore drying, pellet manufacturing, cooling, and handling equipment controlled by wet scrubbers and baghouse dust collectors. Hematite and magnetite concentrates are processed in the on-site taconite pellet plant; however, magnetite has not been mined or processed at Tilden in several years.

In 2016, Tilden purchased from Empire the property and buildings housing EUBOILER6 and EUBOILER7. On August 1, 2016, a minor modification was submitted to transfer these emission units from Empire to Tilden, creating FGBOILERS6-7.

PTI# 202-16 was issued on May 26, 2017 for EUBOILER4, a 300 MMBTU/hour heat input capacity boiler fired with natural gas only that is controlled with a low-NOx burner. This boiler replaced EUBOILER2. PTI# 202-16 was rolled into the ROP and EUBOILER2 was removed. MI-ROP-B4885-2017A was issued August 14, 2018.

FGBOILERS1-2, EUBOILER3, EUBOILER4 and FGBOILER6-7 are subject to 40 CFR Part 63 Subparts A and DDDDD (Major Source Boiler MACT). FGBOILERS and FGBOILERS6-7 are subject to 40 CFR Part 63 Subpart Dc. EUBOILER4 is also subject to 40 CFR Part 63 Subpart Db.

Taconite pellets are transported from the Tilden mine 16 miles east via the Lake Superior & Ishpeming (LS&I) Railway to the Lake Superior port city of Marquette. Once to the LS&I dock, the taconite pellets are gravity loaded into the holds of bulk lake freighters by way of the exclusive pocket-style design of the dock. Due to the closure of the WE Energies Presque Isle Power Plant in May of 2019, Cliffs was issued a permit to install (PTI# 335-77B) on July 31, 2019, to assume responsibility of the Ship Unloading Facility (SUF) adjacent to the LS&I dock. The SUF is used to offload limestone and coal from bulk lake freighters for use in the production of the taconite pellets at Tilden. PTI# 335-77B has no emission limits, but does have material limits for coal and limestone and requirements for a fugitive dust plan. The company has 180 days from the date of issuance of the PTI to develop a fugitive dust plan, due on January 27, 2020. No throughput records were requested for coal or limestone, as the limits in the PTI are very conservative and include throughput for both the Tilden and Empire mines. Since Empire is indefinitely idled, it is assumed coal and limestone throughput are well below permitted limits.

COMPLIANCE

I visited the facility multiple times during FY19 to become more familiar with the layout of the pellet plant and

operational process. All visitors and employees must check-in at the guard shack at arrival. Annual safety training is required prior to gaining access to the interior of the property and appropriate PPE must be worn, including steel-toed boots, hardhat, ear and eye protection, and high-visibility safety vest. It is very dusty inside the pellet plant—it is optional to wear respiratory protection.

My contacts at the mine are Mr. Brent Ketzenberger, Area Environmental Manager, and Mr. Tom O'Brien, Environmental Engineer.

FGDUSTCOLLECTORS

Tilden can process both hematite and magnetite ores utilizing single stage crushing. Primary and secondary ore crushing, conveyor transfer points, bentonite feeders and mixer blenders, pellet cooler discharge hoppers, low head feeders, and transfer towers are sources of PM controlled via wet scrubbers and emission units that are regulated under the flexible group FGDUSTCOLLECTORS.

The facility is required to continuously monitor pressure drop and scrubber liquid flow rate using a Continuous Parameter Monitoring System (CPMS) and is required to report excursions or exceedances that result in deviations from standard operations. The facility is also required to report monitoring malfunctions.

Upon request of district AQD staff, the facility provided scrubber data for the dates of January 15, 2019 through February 15, 2019. *There were several missing data points either due to malfunctioning or non-functioning monitors.* According to the company corrective action was performed on all scrubbers that were outside standard operating parameters to maintain compliance with the Taconite MACT.

Testing is required every five years as specified in SC No. V.1 of FGTACONITEMACT. The most recent test was performed on EU-CONV17.1-17.2 and EU-UNIT2LHF on March 23, 2016. Results were acceptable to EGLE AQD.

EUOREDRYER1/EUOREDRYER2

Tilden operates two ore concentrate dryers, EUOREDRYER1, rated at 400 tons/hour throughput and 70 MMBTU/hour heat input, and EUOREDRYER2 is rated at 800 tons/hour throughput and 125 MMBTU/hour heat input. These are fired with natural gas or used oil and emissions are controlled with cyclones and wet scrubbers.

EUOREDRYER1 and 2 both have limits for Arsenic, Cadmium, Chromium, and Lead while burning used oil. Each emission unit also has material limits and process/operation restrictions when burning used oil; however, these emission units have not burned used oil in several years. They are now exclusively fired on natural gas.

EUOREDRYER1 and 2 both have limits for PM and are required to test every five years (SC No. V.1 for both EUs and SC No. V.3 of FGTACONITEMACT). The last PM test for these units was December 14-15, 2011. Results were acceptable to AQD; however, *the facility is overdue for PM testing for these emission units. PM testing was due to occur December of 2016.*

The facility is required to continuously monitor pressure drop and scrubber liquid flow rate using a Continuous Parameter Monitoring System (CPMS) and is required to report excursions or exceedances that result in deviations from standard operations. The facility is also required to report monitoring malfunctions.

For EUOREDRYER1 scrubber compliance, random dates selected for audit (January 15, 2019 through February 15, 2019) showed *pressure drop and flow rate monitors were either malfunctioning or not functioning for over half of the dates requested.*

For EUOREDRYER2 scrubber compliance, random dates selected for audit (January 15, 2019 through February 15, 2019) showed consistent pressure drop and flow rate for the north scrubber; however, the *south scrubber had highly inconsistent pressure drop readings* but regular flow rate.

EUKILN1/EUKILN2

Two 590 mBTU/hour heat input grate-kiln indurating furnaces that dry and preheat pellets on a traveling grates and then the pellets are heated in large rotary kilns. EUKILN1 (Tilden 1) was built in 1974, and EUKILN2 (Tilden 2) was built in 1978. These two emission units are fired with coal and/or natural gas, or used oil, and are controlled with dry electrostatic precipitators. Each kiln has two stacks, north and south. Both EUKILN1 and EUKILN2 utilize two ESPs each.

EUKILN1 and 2 both have limits for Arsenic, Cadmium, Chromium, and Lead while burning used oil. Each emission unit also has material limits and process/operation restrictions when burning used oil; however, these emission units have not burned used oil in several years. They are currently being fired on natural gas and coal only. During the Ozone Control Period (May 1 through Sept 30) coal is used in combination with natural gas to reduce NOx emissions (SC No. IX.1 for both EUs). During the winter months the kilns are operated exclusively on natural gas.

EUKILN1 and 2 both have limits for PM and are required to test every five years (SC No. V.1 for both EUs and SC No. V.4 and No. V.5 of FGTACONITEMACT). EUKILN1 and 2 have separate emission limits for PM when processing magnetite or hematite; however, the facility has not processed magnetite in several years. The most recent PM test for these units was July 24-26, 2018. Results were acceptable to AQD.

A COMS is installed in each stack to monitor opacity (SC No. VI.7 for both EUs and SC No. III.3 and No. VI.3 of FGTACONITEMACT) as an indicator of proper operation of the ESPs. The facility is required to report excursions or exceedances that result in deviations from standard operations. The facility is also required to report monitoring malfunctions. From January 1, 2019 to June 30, 2019, all emission exceedances were limited to startup/shutdown events typically associated with equipment maintenance and did not exceed more than 1% of the duration of total source operation time. COMS monitoring downtime also was limited to less than 1% of total source operating time. COMS are required to be calibrated per 40 CFR Part 60 Subpart A and were most recently calibrated April 24, 2019 and audited for accuracy April 24 through May 2, 2019. There were no issues during testing and results are acceptable to AQD.

EUKILN1 has a 500 pph SO2 limit (SC No. I.8) and is monitored with a CEMS. The facility is required to report excursions or exceedances that result in deviations from standard operations. The facility is also required to report monitoring malfunctions. EUKILN1 SO2 CEMS reported data for the 1st and 2nd quarters of 2019 show daily SO2 levels well below the limit of 500 pph. Monitoring downtime was limited.

EUKILN1 has two NOx limits, one for burning natural gas only and one for burning coal or a mixture of coal and natural gas, 2.8 lbs/MMBTU and 1.5 lbs/MMBTU, respectively. While the SO2 and NOx CEMS are calibrated quarterly and the company is reporting hourly NOx emission data from the CEMS, the facility is not reporting excess emissions of NOx for EUKILN1. Because the State of Michigan's NOx BART limit is the subject of ongoing proceedings and has not been approved by US EPA, the company claims the effective date of the NOx limit set forth in PTI# 148-12A has yet to be validated. *Review of 2nd quarter 2019 raw hourly CEMS data for EUKILN1 NOx shows the hourly average typically exceeding the limits established in SC No. I.9 and SC No. I.10.*

To ensure compliance with SC No. I.7, EUKILN1 and 2 are required to sample the sulfur content (SC No. VI.1 for both EUs) of the coal burned for each barge shipment received. Appendix 4 requires ash content and BTU content to be analyzed as well. Sample analyses are submitted with annual and semi-annual reports. The most recent samples were collected in June and July of 2019. Analysis results and calculations from production data supplied by the company show SO2 emissions from coal well below the limit of 28,800 lb/day (SC No. I.7).

FGTACONITEMACT

FGDUSTCOLLECTORS, EUOREDRYER1, EUOREDRYER2, EUKILN1, and EUKILN2 make up the flexible group FGTACONITEMACT. This flexible group regulates PM emissions and is based on the regulations found in the Taconite MACT (40 CFR 63 Subpart RRRRR), as described previously. Testing is required every five years. See previous emission units above for compliance information.

BOILERS

The facility has multiple boilers which range from less than 100 MMBTU/hour to 300 MMBTU/hour and are fired by natural gas and/or used oil:

EUBOILER1 and EUBOILER2 were combined into FGBOILERS1-2; however, EUBOILER2 has been replaced by EUBOILER4. EUBOILER1 has a 225 MMBTU/hour heat input capacity and is capable of firing on natural gas or used oil. EUBOILER1 has limits for Arsenic, Cadmium, Chromium, and Lead while burning used oil. EUBOILER1 also has material limits and process/operation restrictions when burning used oil; however, this emission unit has not burned used oil in several years and is currently being fired on natural gas.

EUBOILER3: 240 MMBTU/hour heat input capacity. EUBOILER3 has limits for Arsenic, Cadmium, Chromium, and Lead while burning used oil. EUBOILER3 also has material limits and process/operation restrictions when

burning used oil; however, this emission unit has not burned used oil in several years and is currently being fired exclusively on natural gas. EUBOILER3 is required to have a tune-up every 5 years per SC No. III.4; last tune-up was completed in August/September of 2016.

EUBOILER4: This is the newest boiler and it was installed in late 2018 and went into operation February 1, 2019. This is a 300 MMBTU/hour heat input capacity boiler fired exclusively on natural gas and is controlled by a low-NOx burner. This boiler has emission limits for NOx, SO2, and CO.

- NOx is monitored via PEMS; initial 30-day compliance test of the PEMS was satisfactorily completed during the month of May 2019 (SC No. IX.1). PEMS RATA completed successfully May 14-15, 2019. No excess emissions reported for 2nd quarter of 2019; PEMS downtime was 0.89% of total source operating time.
- SO2 compliance is verified via fuel certification of the sulfur in the fuel; pipeline quality natural gas in Michigan has a stable sulfur content. *The facility has not yet provided fuel certification for SO2 compliance.*
- CO emissions are compliant upon passing initial stack testing which successfully took place on May 14, 2019. Results were below the limit established in SC No. I.3.
- EUBOILER4 is required to have a tune-up annually and every 5 years (SC No. IX.2). EUBOILER4 has not been in operation long enough for an annual or 5 year tune-up.

EUBOILER6 and EUBOILER7 are combined into FGBOILERS6-7. These emission units are each rated at 19.46 MMBTU/hour and can burn natural gas and/or used oil/fuel oil. These emission units have no emission limits but do have material limits regarding used oil/fuel oil. These boilers have not operated firing used oil/fuel oil in several years and are currently operated firing only natural gas.

FGBOILERS

The smaller boilers in FGBOILERS have a maximum rated heat input of 100 MMBTU/hour and are each controlled by low-NOx burners. These boilers are permitted to only operate while firing natural gas (SC No. II.1). Verification of NOx emission limit of 0.05 lb/MMBTU may be verified at the request of EGLE AQD; however, no request has been made. The facility is required to monitor and record the total amount of fuel used for FGBOILERS in a 12-month rolling time frame (SC No. VI.2). *The company did not reported any throughput for FGBOILERS for 2018*; however, it was noted in the records request that FGBOILERS did not use any fuel from January 15, 2019 to February 15, 2019.

SUMMARY

Scrubber function needs to be monitored more closely for EUOREDRYER1, EUOREDRYER2, FGDUSTCOLLECTORS and FGTACONITEMACT. Corrective action needs to be more expedient when scrubber monitoring/performance fails or malfunctions.

EUOREDRYER1 and EUOREDRYER2 are both overdue for PM testing. PM testing needs to be scheduled as soon as possible to bring these two emission units back into compliance.

NOx CEMS data for EUKILN1 shows the hourly average typically exceeding the limits established in SC No. I.9 and SC No. I.10; however, the company is not reporting excess NOx emissions at this time.

The company did not report any fuel throughput to MAERS for FGBOILERS for 2018.

The facility appears to be in compliance with the remainder of MI-ROP-B4885-2017A.

NAME _____ DATE 9/30/19 SUPERVISOR _____