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

B488556840

FACILITY: TILDEN MINING COMPANY LC		**SRN / ID:** B4885
LOCATION: 1 TILDEN MINE ROAD, ISHPEMING		**DISTRICT:** Marquette
CITY: ISHPEMING		**COUNTY:** MARQUETTE
CONTACT: BRENT KETZENBERGER , AREA MGR - ENVIRONMENTAL		**ACTIVITY DATE:** 01/27/2021
STAFF: Sydney Hewson	**COMPLIANCE STATUS:** Non Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Onsite Inspection to verify compliance with MI-ROP-B4885-2017and all other applicable state and federal air quality regulations		
RESOLVED COMPLAINTS:		

On January 27, 2021 I (Sydney Hewson) performed an onsite inspection of the Tilden Mine Company L.C. located at 1 Tilden Mine Road Ishpeming, Michigan. While onsite I met with Tom O'Brien, Environmental Engineer and Brent Ketzenberger, Environmental Manager. Mr. O'Brien gave me an overview of taconite mining and processing, took me on a tour of the facility, and showed me the current operating parameters of the equipment onsite.

Facility Description:

Tilden Mining Company LLC (Tilden) operates an open-pit iron ore mine and various material handling, crushing, milling, concentrating, ore drying, pellet manufacturing, cooling, and handling equipment controlled by wet scrubbers and baghouse dust collectors. Tilden can process both hematite and magnetite ores, currently they only process hematite. The Tilden facility operates two 460 million BTU per hour heat input grate-kiln indurating furnaces controlled by electrostatic precipitators. Tilden 1 was built in 1974 and Tilden 2 was built in 1978. The facility has three boilers ranging from 225 to 240 million BTU per hour each, fired by natural gas and used oil fuel and a general permit to install for natural gas/propane fired boilers with maximum rated heat input of 100 MMBtu per hour, each controlled by low-NOx burners. In 2016, Tilden purchased from Empire the property and buildings housing EU-BOILER6 and EU-BOILER7. On August 1, 2016, a minor modification was submitted to transfer these emission units from Empire to Tilden.

Below is a summary of compliance with MI-ROP-B4885-2017 and all other applicable state and federal air quality regulations:

Emission Unit:

EUOREDRYER1:

Unit Description: Ore Concentrate Dryer #1 (EUOREDRYER1) is rated at 400 tons per hour throughput and 70 million BTU per hour heat input. EUOREDRYER1 is fired with natural gas and used oil. The used oil is supplied from the 1.5 million gallon storage tank, which may contain used oil and virgin fuel oil. All oil burned from this tank is considered used oil. EUOREDRYER1 is controlled with a cyclone pre-cleaner and a wet scrubber.

Emission Limits:

Pollutant	Emission Limit	Records Reviewed

Arsenic	0.0009 tpy	0 (EUOREDRYER1 has not operated on used oil since 2010)
Cadmium	0.0009 tpy	
Chromium	0.0009 tpy	
Lead	0.00265 tpy	
PM	0.10 lb/1000 lbs.	

Testing/Sampling:

PM emission rates from EUOREDRYER1 were last tested in December 2011. The facility is past due for testing, they plan to test this dryer spring 2021.

Monitoring/Recordkeeping:

EUOREDRYER1 has not operated on used oil since December 2010. An oil analysis from 2010 is attached to the hard file of this report. The facility continuously measures pressure drop and scrubber flow using a continuous parameter monitoring system (CPMS). Scrubber Flow and pressure drop records for 2/19/20 and 10/20/20 are attached to the hard file of this report.

Reporting:

Tilden submitted a semiannual and annual certifications of compliance, deviation reports, monitor downtime reports, and excursion/exceedance reports on January 22, 2021.

Other Requirements:

This unit is subject to 40 CFR Part 64 Compliance Assurance Monitoring (CAM), the scrubber flow and pressure drops all appear to be within the indicator ranges defined in the CAM plan.

Emission Unit:

EUOREDRYER2:

Unit Description:

Ore Concentrate Dryer #2 (EUOREDRYER2) is rated at 800 tons per hour throughput and 125 million BTU per hour heat input. The dryer is fired with natural gas and used oil supplied from the 1.5 million gallon storage tank. EUOREDRYER2 is controlled with two cyclone pre-cleaners and two wet scrubbers.

Pollution Control Equipment:

Two cyclone pre-cleaners and two wet scrubbers.

Emission Limits:

Pollutant	Emission Limit	Records Reviewed
Arsenic	0.0016 tpy	0 (EUOREDRYER2 has not operated on used oil since 2010)
Cadmium	0.0016 tpy	
Chromium	0.0016 tpy	
Lead	0.0048 tpy	
PM	0.10 lb/1000 lbs.	

Material Limits:

EUOREDRYER2 has not used fuel oil since 2010.

Testing/Sampling:

Tilden has not tested EUOREDRYER2 since 2011, the plan to retest this unit spring 2021. The test report from 2011 is attached to the hard copy of this report.

Monitoring/Recordkeeping:

EUOREDRYER2 has not operated on used oil since December 2010. An oil analysis from 2010 is attached to the hard file of this report. The facility continuously measures pressure drop and scrubber flow using a continuous parameter monitoring system (CPMS). Scrubber Flow and pressure drop records for 2/19/20 and 10/20/20 are attached to the hard file of this report.

Reporting:

Tilden submitted a semiannual and annual certifications of compliance, deviation reports, monitor downtime reports, and excursion/exceedance reports on January 22, 2021.

Other Requirements:

This unit is subject to 40 CFR Part 64 Compliance Assurance Monitoring (CAM), the scrubber flow and pressure drops all appear to be within the indicator ranges defined in the CAM plan.

EUKILN1

Emission Unit Description:

Unit 1 Grate Kiln Indurating Furnace (EUKILN1) dries and preheats pellets on a traveling grate and then heats the pellets in a rotary kiln for final induration. EUKILN1 main burners are rated at 590 million BTU per hour heat input. The Tilden facility produces hematite pellets and magnetite pellets. EUKILN1 is fired with coal, natural gas, or used oil supplied from the 1.5-million-gallon storage tank which may contain used oil and virgin fuel oil. All oil burned from this tank is considered used oil. The unit is controlled with dry electrostatic precipitators.

Pollution Control Equipment:

Dry Electrostatic precipitators

Emission Limit:

Pollutant	Emission Limit	Actual
Arsenic	0.0058 tpy (When firing used oil)	0 tpy. The facility has not operated EUKILN1 on fuel oil since 2010
Cadmium	0.0058 tpy (When firing used oil)	
Chromium (total)	0.0058 tpy (When firing used oil)	
Lead	0.017 tpy (When firing used oil)	
PM	200 lb/hr	PM emission rates from EUKILN1 were last verified via stack test in 2018, the results are attached to the hard file of this report. Kiln 1: 26.01 lb/hr and 0.0129 lbs/1000 lbs exhaust (South stack) 9.98 lb/hr and 0.0105 lbs/1000 lbs exhaust (North Stack) 36.3 lbs/hr through February 5 2020 151.9 lbs/hr through October 5, 2020 (Records attached to the hard file of this report including CEMS data)
PM	0.065 lb/1000 lbs of exhaust gas	
SO_2	28,800 lbs/day (Calendar Day)	
SO_2	500 lb/hr (30 day rolling average)	
NO_x		

	2.8 lbs/MMBtu (720-hour rolling average/when burning natural gas)	1.46 lbs/mm btu December 01 2020 records (attached to the hard copy of this report)
NO_x	1.5 lbs/MMBtu (720-hour rolling average/when burning coal or a mixture of coal and natural gas)	

The NOx limits in 40 CFR 52.1183(k)(1) are not yet effective. In accordance with (k)(1)(vii) of the BART FIP rule, US EPA has until May 12, 2021 to take final agency action by publishing its final confirmation or modification of the NOx limits in the Federal Register". Tilden submitted a confidential business information report to US EPA on February 12, 2021 proposing NOx limits for final agency action based on 720-hour average CEMs data ranging from 1.8 to 3.8 lb NOx/MMBtu. The BART FIP NOx limit will become effective and enforceable when US EPA publishes it in the Federal Register.

Process/Operational Restrictions & Design/Equipment Parameters:

Electrostatic Precipitator operation parameters were observed during the onsite inspection. Images of the operation screen are in this report. NOx and SO2 emissions were being recorded continuously at the time of the inspection. Records of NOx and SO2 CEMs Data for February 5 and October 5 2020 for Kiln 1 are attached to the hard file of this report.

Testing/Sampling:

PM testing on Kiln 1 was last performed in 2018, Test results are summarized above and the report is attached to the hard file.

Monitoring/Record Keeping/Reporting:

Tilden submitted a coal analysis for 2020 on January 22, 2021. The sulfur contents reported ranged from 0.26-0.63 %. They also submitted records of used fuel oil burned in EUKILN1, there was no fuel oil burned in 2020. Emissions from used oil were also 0. Continuous SO2 and NOx emissions from kiln 1 are included in the semiannual report received January 22, 2021. COMs data and calibration records are included in the semi-annual report. The facility submits annual ROP certifications and semiannual deviation reports.

Other Requirements:

This unit is subject to 40 CFR Part 64 Compliance Assurance Monitoring (CAM), opacity readings from the ESPs all appear to be within the indicator ranges defined in the CAM plan.

EUKILN2

Unit Description:

Unit 2 Grate Kiln Indurating Furnace (EUKILN2) dries and preheats pellets on a traveling grate and then heats the pellets in a rotary kiln for final induration. EUKILN2 main burners are rated at 590 million BTU per hour heat input. The Tilden facility produces hematite pellets and magnetite pellets. EUKILN2 is fired with coal, natural gas, or used oil supplied from the 1.5 million gallon storage tank which may contain used oil and virgin fuel oil. All oil burned from this tank is considered used oil. The unit is controlled with dry electrostatic precipitators.

This unit was not operating at the time of my inspection.

Pollution Control Equipment:

Dry Electrostatic Precipitator

Emission Limit:

Pollutant	*Emission Limit*	*Actual*
Arsenic	0.0058 tpy (when firing used oil)	EUKILN2 has not fired on used oil since 2010
Cadmium	0.0058 tpy (when firing used oil)	
Chromium (total)	0.0058 tpy (when firing used oil)	
Lead	0.017 tpy (when firing used oil)	
PM	0.065 lb. / 1000 lbs. of exhaust gases	0.0039 lbs/1000 lbs Dry exhaust gas (July 24-26 2018 Stack Test)
PM	200 pph	12.04 lbs/hr (July 24-26 2018 Stack Test)
SO_2	28,800 lbs. per day	871.9 lbs/day (02/5/2020) 1,598.4 lbs/day (10/5/2020)

Process/Operational Restrictions and Testing/Sampling Monitoring/Record Keeping:

The facility has not operated on used oil since 2010. Testing was last done July 2018. Tilden keeps records of sulfur content of coal burned in EUKILN2. Tilden submitted a coal analysis for 2020 on January 22, 2021. The sulfur contents reported ranged from 0.26-0.63 %. They also submitted records of used fuel oil burned in EUKILN2, there was no fuel oil burned in 2020. Emissions from used oil were also 0. Continuous SO2 and NOx emissions from kiln 2 are included in the semiannual report received January 22, 2021. COMs data and calibration records are included in the semi-annual report. The facility submits annual ROP certifications and semiannual deviation reports.

Other Requirements:

This unit is subject to 40 CFR Part 64 Compliance Assurance Monitoring (CAM), opacity readings from the ESPs all appear to be within the indicator ranges defined in the CAM plan.

EUBOILER3

Emission Unit Description: Boiler #3 is rated at 240 million BTU per hour heat input capacity and is fired with natural gas and used oil supplied from the 1.5 million gallon storage tank.

Emission Limits/Material Limits/Monitoring and Record Keeping:

Pollutant	*Limit*	*Actual*
Arsenic	0.06 tpy	Use Oil was last combusted in EUBOILER3 October 2010. The oil analysis from 2010 is attached to the hard copy of the report
Cadmium	0.06 tpy	
Chromium	0.06 tpy	
Lead	0.18 tpy	

***Process/Operational Restrictions*:**

The boiler tune up was last done 03/15/2017. The certification is attached to the hard copy of this report.

Reporting:

Tilden submitted a semiannual and annual certifications of compliance, deviation reports, monitor downtime reports, and excursion/exceedance reports on January 22, 2021.

FGDUSTCOLLECTORS:

Flexible Group Description:

Various ore, concentrate, and finished pellet handling processes throughout the facility, including primary and secondary ore crushing, conveyor transfer points, bentonite feeders and mixer blenders, pellet cooler discharge hoppers, low head feeders, transfer towers, etc. The various emission units are controlled with wet scrubbers.

Emission units: EU-CONV14-15-16, EU-CONV15.8-15.9, EU-CONV15.9-16.1, EU-CONV16.1-17.1, EU-CONV17.1-17.2, EU-CONV19&19A-17, EU-CONV13-17.1, EU-CONV15-15.1, EU-CONVEYOR1, EU-CONVEYOR12A-13, EU-CONVEYOR12B-13, EU-CONVEYOR4A-4A1, EU-CONVEYOR4B-4C, EU-CONVEYOR4C-4D, EU-FEEDMIXER1, EU-FEEDMIXER2, EU-PRIMARYCRUSHER, EU-SCREENSRECLAIM, EU-COOLER1, EU-COOLER2, EU-TRANSFERTOWER1, EU-TRANSFERTOWER2, EU-UNIT1LHF, EU-UNIT2LHF, EU-PRODCONV2

Design/Equipment Parameters/Monitoring and Record Keeping:

Tilden Mine continuously monitors pressure drop and scrubber liquid flow rate, records for October 20, 2020 and February 19, 2020 are attached to the hard copy of this report. A picture of operation parameters during my inspection are also attached to the hard file of this report.

Reporting:

Tilden submitted a semiannual and annual certifications of compliance, deviation reports, monitor downtime reports, and excursion/exceedance reports on January 22, 2021.

Other Requirements:

This units in this flexible group are subject to 40 CFR Part 64 Compliance Assurance Monitoring (CAM), scrubber flow rates and pressure drops from all scrubbers appear to be within the indicator ranges defined in the CAM plan.

FGBOILERS

Flexible Group Description:

One or more propane or natural gas-fired boilers, each with a maximum rated heat input of 100 million Btu per hour, and each controlled by a low-NOx burner.

Pollution Control Equipment:

Low-NOx Burner

Tilden Mine never installed any boilers under PTI 147-13 where the NOx emission limit of 0.05 lb/mmBTU was established, there are no units currently required to meet the requirements in FGBOILERS.

FGTACONITEMACT

Flexible Group Description:

The affected source is an existing taconite iron ore processing plant, that is (or is part of) a major source of hazardous air pollutant (HAP) emissions. An existing affected source is a source that commenced construction or reconstruction before December 18, 2002. The regulations cover emissions from ore crushing and handling emission units, ore dryer stacks, indurating furnace stacks, finished pellet handling emission units, and fugitive dust emissions.

Emission Units: **EUOREDRYER1, EUOREDRYER2, EUKILN1, EUKILN2, and FGDUSTCOLLECTORS**

Pollution

Control Equipment: **Cyclone pre-cleaners, wet scrubbers and dry electrostatic precipitators**

Emission Limits/Testing and Sampling:

Pollutant	Emission Limit	Equipment	Actual Emission/Compliance
PM	0.008 gr/dscf	All affected source Ore Crushing and Handling Emission Units: EU-CONV14-15-16 EU-CONV15.8-15.9 EU-CONV15.9-16.1 EU-CONV16.1-17.1 EU-CONV17.1-17.2 EU-CONV19 & 19A-17 EU-CONV13-17.1 EU-CONV15-15.1 EU-CONVEYOR1 EU-CONVEYOR12A-13 EU-CONVEYOR12B-13 EU-CONVEYOR4A-4A1 EU-CONVEYOR4B-4C EU-CONVEYOR4C-4D EU-FEEDMIXER1	During the current ROP cycle 8 representative wet scrubbers have been tested. 17.1 to 17.2 Conveyor Scrubbers were testing March 22 and 23, 2016. The facility still needs to test a representative unit for both Crushing and Handling emission units and Finished Pellet Handling emissions unit for this permit cycle.

		EU-FEEDMIXER2 EU-PRIMARYCRUSHER EU-SCREENSRECLAIM	
PM	0.008 gr/dscf	All affected Finished Pellet Handling emission units: EU-COOLER1 EU-COOLER2 EU-TRANSFERTOWER1 EU-TRANSFERTOWER2 EU-UNIT1LHF EU-UNIT2LHF EU-PRODCONV2	
PM	0.052 gr/dscf	Each individual ore dryer: EUOREDRYER1, EUOREDRYER2	Testing was last done in 2011, the facility is aware they are past due for testing Dryer1, they plan to test this spring 2021.
PM	0.01 gr/dscf	Each individual indurating furnace: EUKILN1 EUKILN2 (Magnetite)	The Facility no longer processes magnetite
PM	0.01 gr/dscf	Each individual indurating furnace: EUKILN1 EUKILN2 (Hematite)	Testing was done July 24-26 2018

Process/Operational Restrictions/Monitoring and Record Keeping:

The facility continuously monitors pressure drop, scrubber flow rate, and amperage (for dynamic wet scrubbers) for each scrubber under FGTACONITEMACT. Attached are records of these parameters for each unit on October 20, 2020 and February 19, 2020.

To demonstrate compliance with 40 CFR Part RRRRR emission limits for EUKILN1 and EUKILN2 the facility uses continuous opacity monitors in lieu of daily average secondary voltage and daily average secondary current. Each of the induration units have three dry electrostatic precipitators which discharge through two stacks, both induration units, A and B ESPs discharge through a common (South) Stack. Opacity is measured on the common stack, not individually. Opacity readings for the north and south stack of the electrostatic precipitators for October 20, 2020 and February 19, 2020 are also attached to the hard file of this report.

Reporting:

Tilden submitted a semiannual and annual certification of compliance, deviation reports, monitor downtime reports, and excursion/exceedance reports on January 22, 2021.

Other Requirements:

The facility had some issues with fugitive dust from the tailing's basin in December, a VN was issued. The facility responded with an updated fugitive dust plan submitted March 8, 2021 to mitigate the basin dust issues. AQD is reviewing the plan and submitting comments before acceptance.

FGBOILERS1-2

Flexible Group Description:

EUBOILER1 and EUBOILER2 are each rated at 225 million BTU per hour heat input capacity and are fired with natural gas and used oil supplied from the 1.5-million-gallon storage tank which may contain used oil and virgin fuel oil. All oil burned from this tank is considered used oil. EUBOILER1 and EUBOILER2 exhaust from a common stack.

Emission Limits/Monitoring and Record Keeping:

Pollutant	*Emission Limit*	*Actual Emissions*
Arsenic	0.12 tpy	The facility has not burned used oil in Boilers 1&2 since October 2010. The last used oil delivery analysis is attached to the file for this report.
Cadmium	0.12 tpy	
Chromium	0.12 tpy	
Lead	0.37 tpy	

Boiler 2 was dismantled 12/31/2017. Boiler 1 had a tune up 03/15/2017, a copy of the tune up is attached to the hard file of this report. Boiler 1 is subject to 40 CFR Part 63 Subpart DDDDD, it appears the facility is following this standard.

Reporting:

Tilden submitted a semiannual and annual certification of compliance, deviation reports, monitor downtime reports, and excursion/exceedance reports on January 22, 2021.

FGBOILERS

Flexible Group Description:

Kewaunee Boilers 6 and 7 (FGBOILERS6-7) are located at the Pit Service Building. Each boiler is rated at 19.46 million BTU per hour. The boilers can burn natural gas, No. 2 fuel oil and/or used oil fuel.

Material Limits/ Process and Operational Restrictions/Monitoring and Record Keeping:

Tilden only burns No. 2 fuel oil or used oil generated from onsite equipment. The most recent used oil combusted in FGBOILERS6-7 was in 2014, the most recent used oil analysis is from 2017, it is attached to the hard file of this report. The total sulfur content of the used oil was 0.251% by weight, this meets the permit requirement of 0.5 percent by weight. FGBOILER6-7 is subject to 40 CFR Part 63 Subpart DDDDD, the most recent boiler tune up was done 03/15/2017, it is attached to the hard file of this report.

Reporting:

Tilden submitted a semiannual and annual certification of compliance, deviation reports, monitor downtime reports, and excursion/exceedance reports on January 22, 2021.

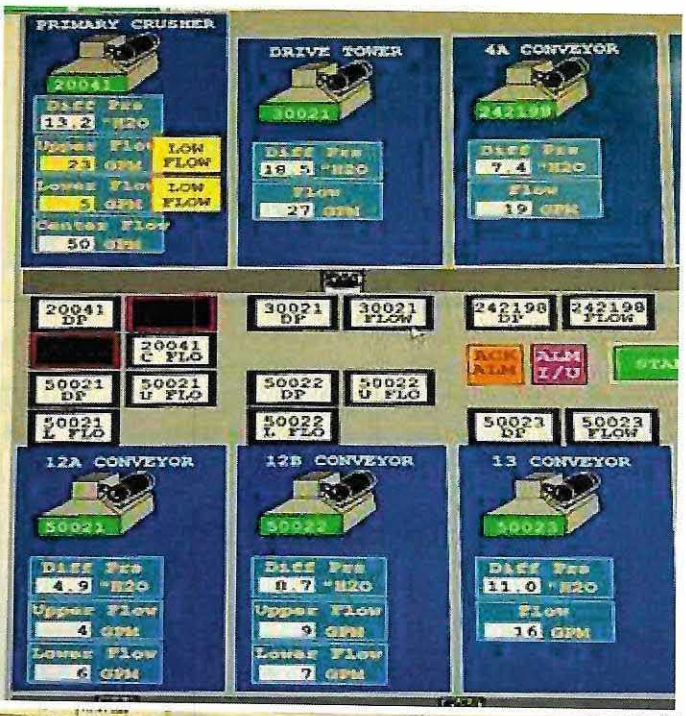
Compliance Discussion:

At the time of my inspection the facility was not in compliance with all the requirements for MI-ROP-B4884-2017. The following requirements have been discussed and need to be completed before Tilden Mine is in compliance:

- Stack testing for Particulate Matter Emissions from EUOREDRYER1 as soon as possible.

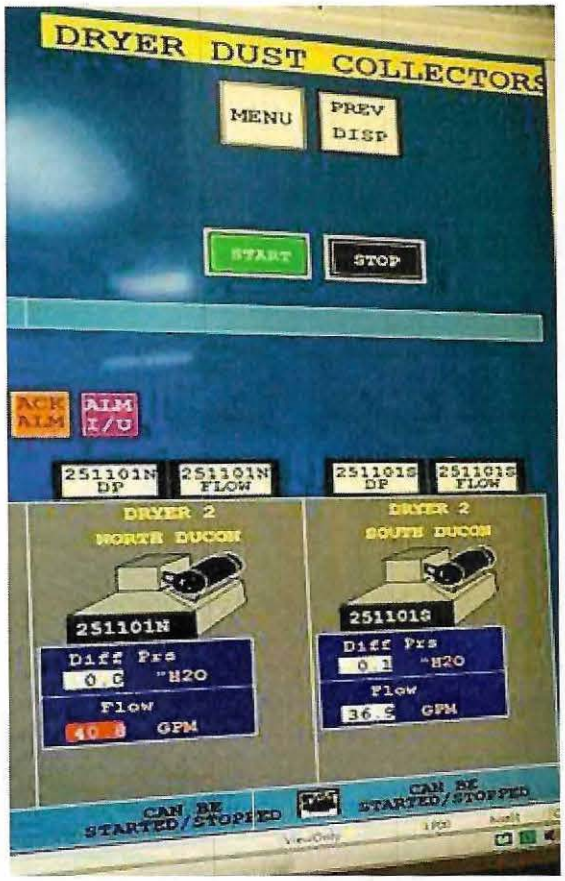
The facility submitted a fugitive dust plan March 8, 2021 for AQD review, upon plan approval the Violation Notice sent December 2020 will be resolved. The facility also still needs to stack test for Particulate Matter emissions from a representative unit for both Crushing and Handling emission units and Finished Pellet Handling emissions unit for this permit cycle as required in FGTACONTITEMACT.

Upon completion of the above requirements the facility appears to be in compliance with all other applicable state and federal air quality regulations.

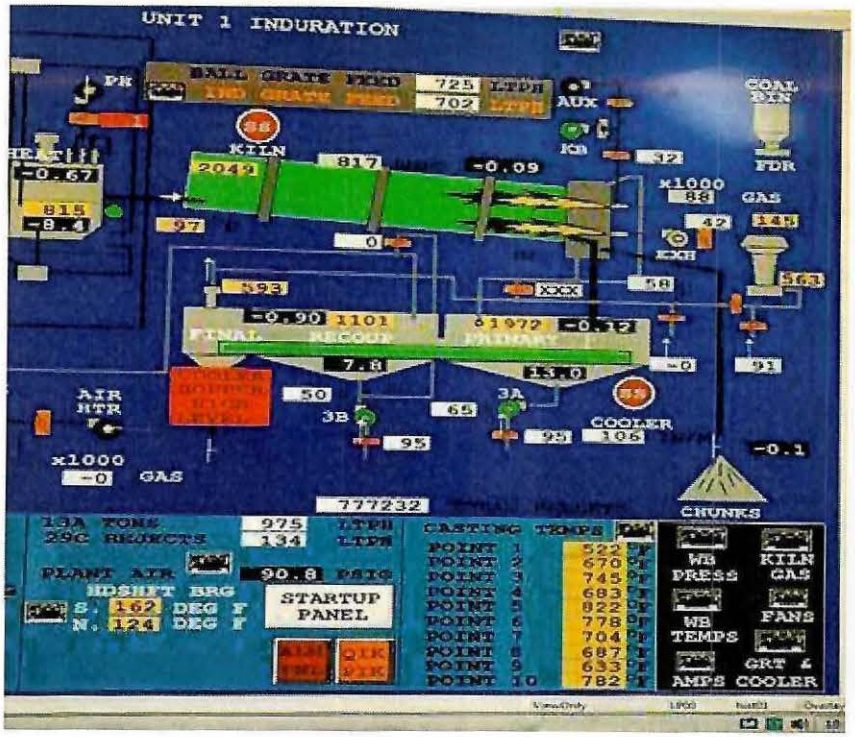


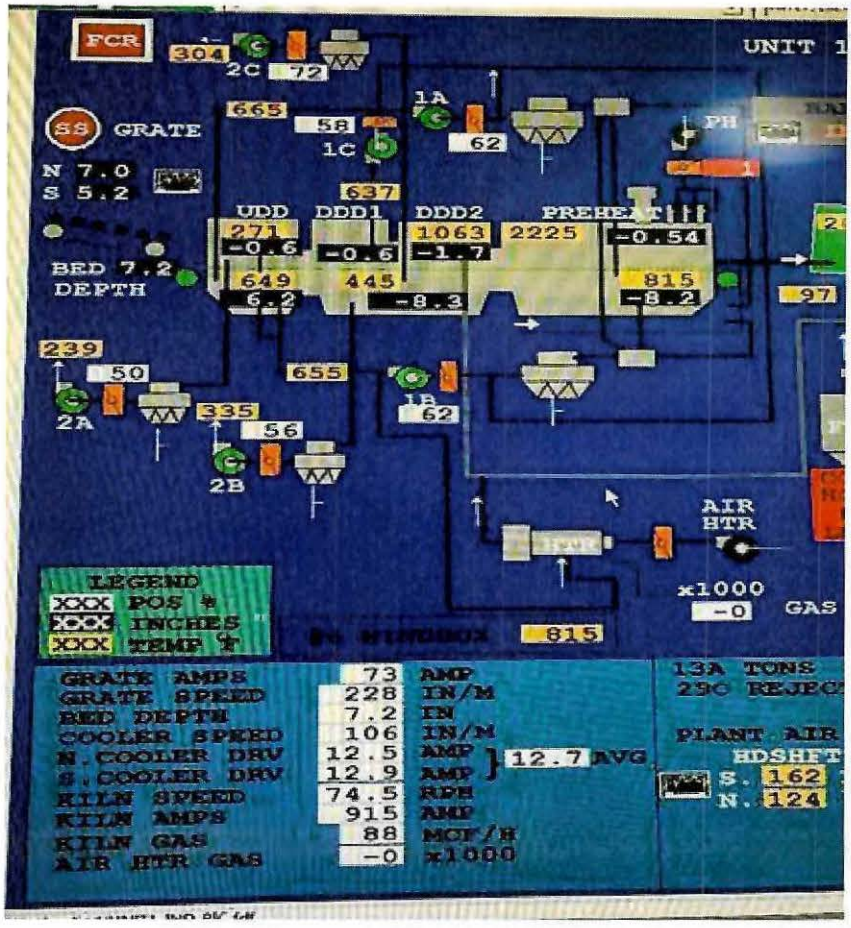
Above are pictures of the operting screen for the concentrator scrubber parameters during my onsite Inspection.

Above are pictures of the Pellet Plant Dust collector pressure drops recorded while onsite.

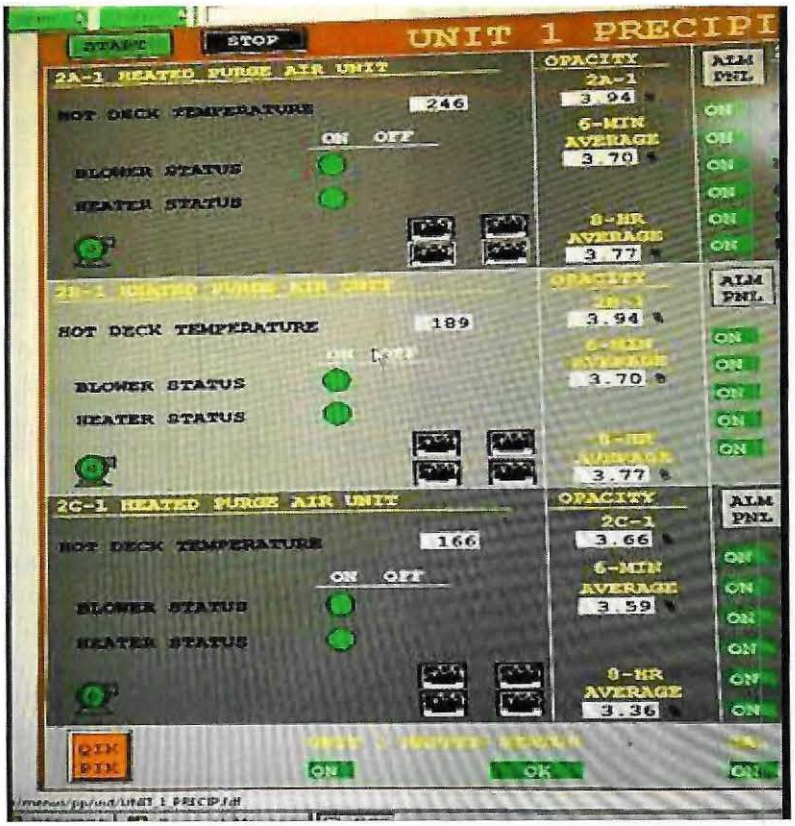


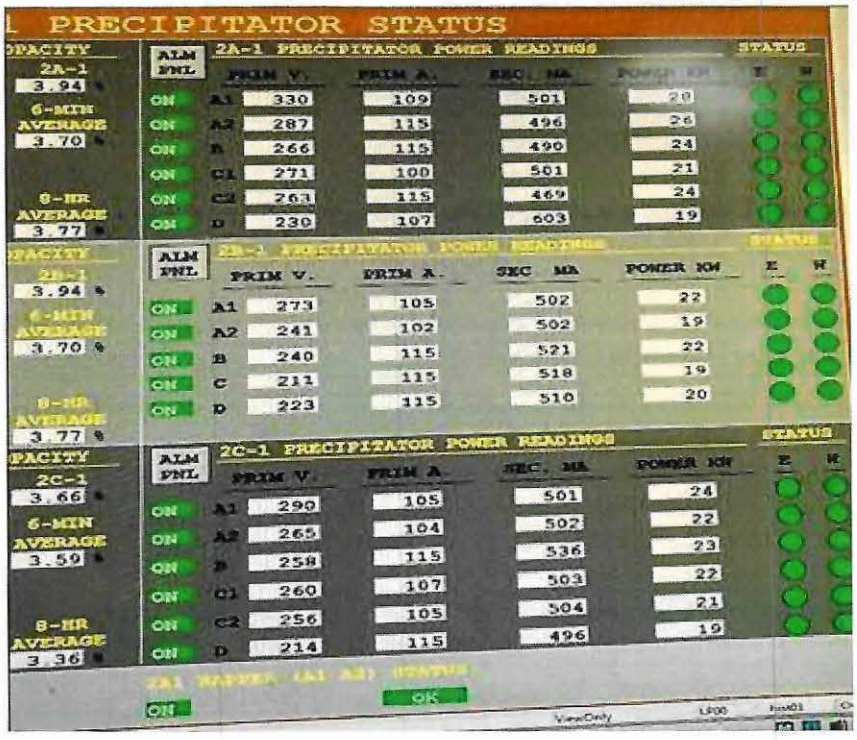
Above are photos of the dryer dust collector/scrubber differential pressure and flow rates recorded during my inspection.



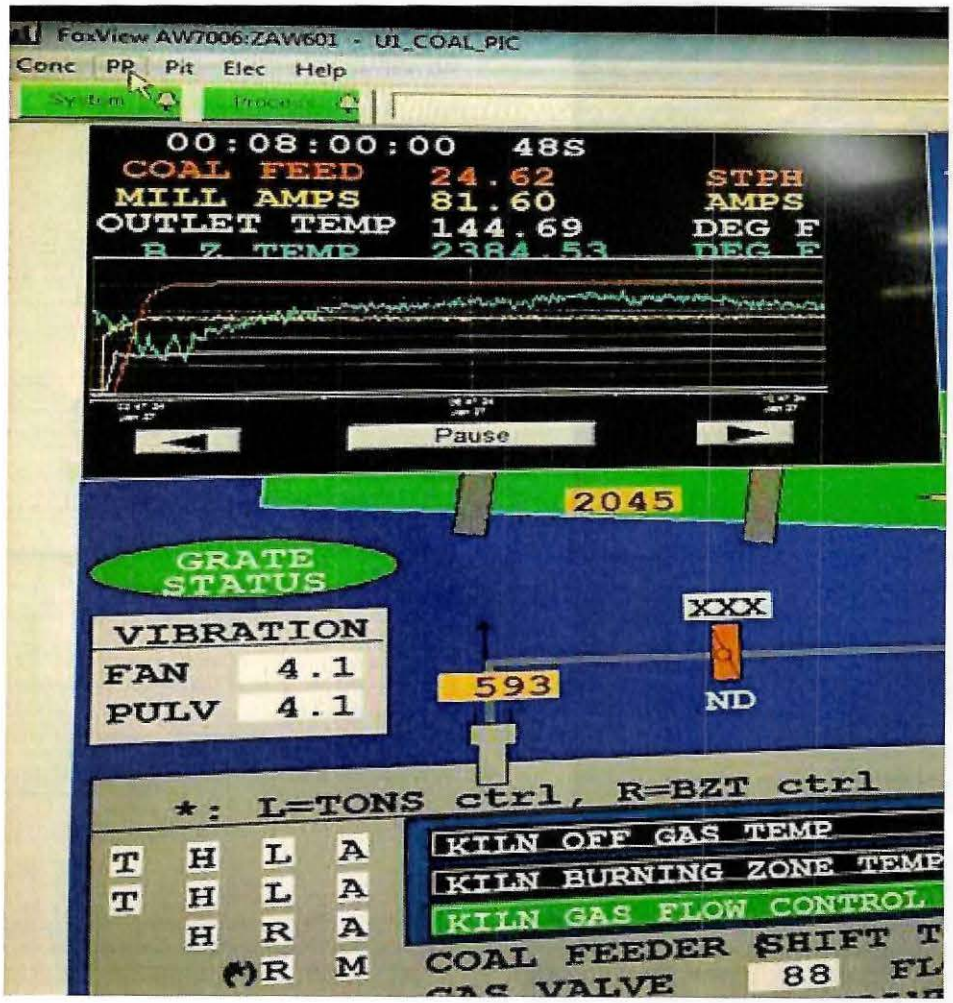


Above are photos of Kiln1 operation parameters during my onsite inspection. (Kiln2 was not operating during the inspection.





Above are photos of the the ESP operation parameters during my inspection.



Above is a photo of the coal feed rate to Kiln 1 during my inspection.

Above is a photo of the Boiler operation parameters during my inspection.

NAME Sysy Hewson DATE 03-12-2021 SUPERVISOR EJL