

Mrs Mpho Nembilwi  
Nkangala District  
P O Box 437  
MIDDLEBERG  
1050  
By email nembilwim@nkangaladm.gov.za'

Date  
29 April 2021

Enquiries S Chokoe  
Tel +27 13 647 6970

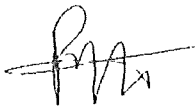
Dear Mrs Mpho Nembilwi

Ref Kendal Power Station AEL (17/4/AEL/MP312/11/15)

**KENDAL POWER STATION'S EMISSIONS REPORT FOR THE MONTH OF MARCH 2021.**

This is a monthly report required in terms of Section 7.4 in the Kendal Power Station's Atmospheric Emission License. The emissions are for Eskom Kendal Power Station.

**Compiled by:**



Tshilidzi Vilane  
**ENVIRONMENTAL OFFICER- KENDAL**

Date: 29/04/2021

**Supported by:**



pp

Solly Chokoe  
**ACTING ENVIRONMENTAL MANAGER- KENDAL**

Date: 29/04/2021

KENDAL POWER STATION'S EMISSIONS REPORT FOR THE MONTHS OF MARCH 2021.

Verified by:

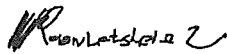


Hono Malatsi

SENIOR TECHNICIAN BOILER ENGINEERING- KENDAL

Date:29/04/2021

Validated by:



Tendani Rasivhetshela

ACTING BOILER ENGINEERING MANAGER-KENDAL

Date 29/04/2021

Supported by:



Malibongwe Mabizela

ACTING ENGINEERING MANAGER-KENDAL

Date

29/04/2021

Approved by:



Yangaphe Ngcashi

GENERAL MANAGER-KENDAL

Date

2021.04.29

KENDAL POWER STATION MONTHLY EMISSIONS REPORT  
 Atmospheric Emission License 17/4/AEL/MP312/11/15



1 RAW MATERIALS AND PRODUCTS

Raw Materials and Products	Raw Material Type	Units	Maximum Permitted Consumption rate	Consumption Rate Mar-2021
	Coal	Tons	2 260 000	637 813
	Fuel Oil	Tons	5 000	1239,82

Production Rates	Product / By-Product Name	Units		Production Rate Mar-2021
	Energy	GWh	4380	1 345 205,00
	Ash	Tons	Not specified	203 462,3
	RE Ash	kg/MWh	Not specified	0,280

2 ENERGY SOURCE CHARACTERISTICS

Coal Characteristic	Units	Stipulated Range	Monthly Average Content
Sulphur Content	%	0,7 TO >1 (%)	0,810
Ash Content	%	30 TO >40 (%)	31,900

3 EMISSION LIMITS (mg/Nm<sup>3</sup>)

Associated Unit/Stack	PM	SOx	NOx
Unit 1	100	3500	1100
Unit 2	100	3500	1100
Unit 3	100	3500	1100
Unit 4	100	3500	1100
Unit 5	100	3500	1100
Unit 6	100	3500	1100

4 ABATEMET TECHNOLOGY (%)

Associated Unit/Stack	Technology Type	Efficiency Mar-2021	Technology Type	Utilization Mar-2021
Unit 1	ESP + SO <sub>3</sub>	99,9%	SO <sub>3</sub>	92,3%
Unit 2	ESP + SO <sub>3</sub>	99,8%	SO <sub>3</sub>	99,5%
Unit 3	ESP + SO <sub>3</sub>	99,7%	SO <sub>3</sub>	97,7%
Unit 4	ESP + SO <sub>3</sub>	99,7%	SO <sub>3</sub>	99,9%
Unit 5	ESP + SO <sub>3</sub>	Unit off	SO <sub>3</sub>	Unit off
Unit 6	ESP + SO <sub>3</sub>	Unit off	SO <sub>3</sub>	Unit off

Note: ESP plant does not have bypass mode operation, hence plant 100% Utilised.

5 MONITOR RELIABILITY (%)

Associated Unit/Stack	PM	SO <sub>2</sub>	NO	O <sub>2</sub>
Unit 1	100,0	0,0	0,0	0,0
Unit 2	100,0	0,0	0,0	0,0
Unit 3	100,0	100,0	100,0	99,7
Unit 4	74,2	0,0	0,0	0,0
Unit 5	Unit off	Unit off	Unit off	Unit off
Unit 6	Unit off	Unit off	Unit off	Unit off

Note 1: Unit 4 PM monitor reliability is low because an average emissions available for the month were used for the 07th until the 14th because of the monitor failure

Note 2: Gaseous Monitor's readings are available but parallel test not yet completed since the repairs thus previous parallel tests data was used

Note 3: Parallel test on unit 3 is completed and factors are implemented and therefore unit 3 monitors readings used.

6 EMISSION PERFORMANCE

Table 6.1 Monthly tonnages for the month of March 2021

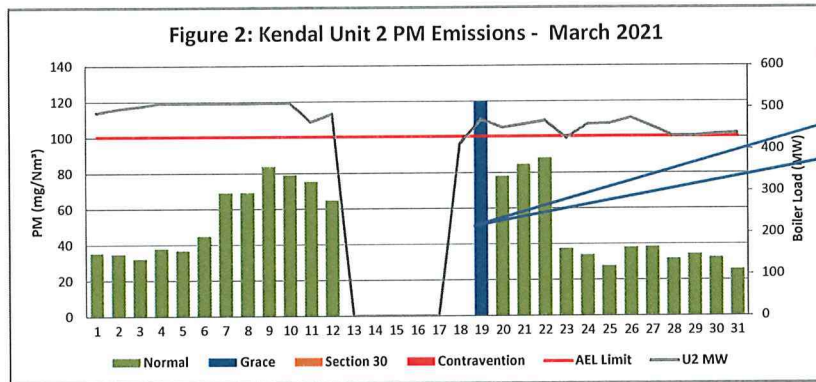
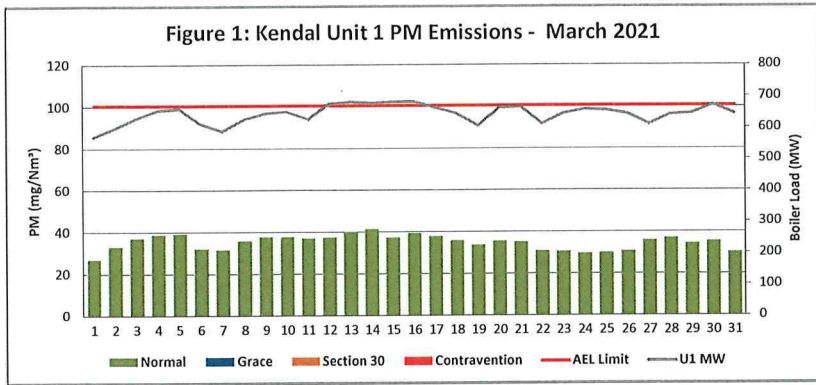
Associated Unit/Stack	PM (tons)	SO <sub>2</sub> (tons)	NO <sub>x</sub> (tons)	CO <sub>2</sub> (tons)
Unit 1	80.0	4.571	1.624	471.033
Unit 2	67.9	3.309	1.462	256.578
Unit 3	99.7	3.633	948	318.619
Unit 4	108.4	5.323	1.829	387.425
Unit 5	Unit off	Unit off	Unit off	Unit off
Unit 6	0.0	0	0	0
SUM	355.95	16.833	5.862	1,433.655

Table 6.2 Operating days in compliance to PM AEL Limit - March 2021

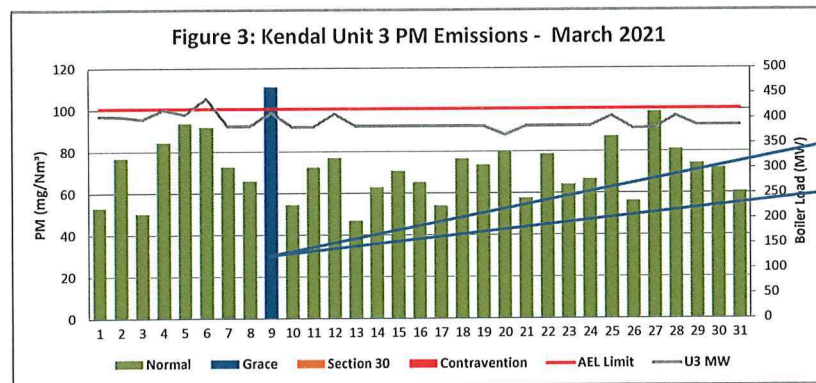
Associated Unit/Stack	Normal	Grace	Section 30 Contravention	Total Exceedance	Average PM (mg/Nm <sup>3</sup> )
Unit 1	31	0	0	0	35.0
Unit 2	24	1	0	1	53.4
Unit 3	30	1	0	1	71.9
Unit 4	29	2	0	2	62.9
Unit 5	Unit off	Unit off	Unit off	Unit off	Unit off
Unit 6	Unit off	Unit off	Unit off	Unit off	Unit off
SUM	114	4	0	4	

Table 6.3 Operating days in compliance to SO<sub>x</sub> AEL Limit - March 2021

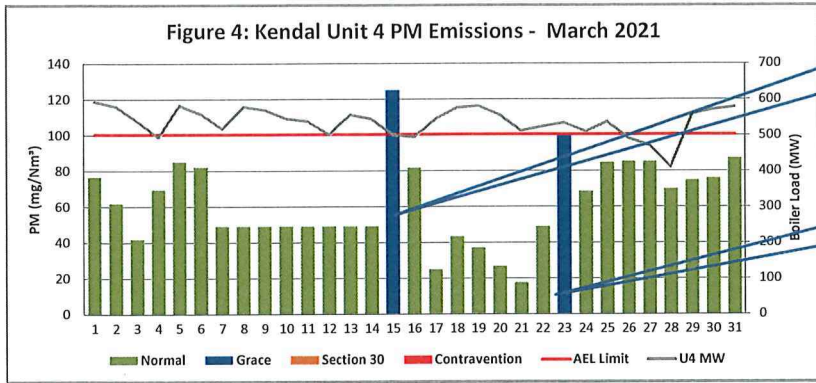
Associated Unit/Stack	Normal	Grace	Section 30 Contravention	Total Exceedance	Average SO <sub>x</sub> (mg/Nm <sup>3</sup> )
Unit 1	31	0	0	0	1,920.2
Unit 2	28	0	0	0	2,467.7
Unit 3	31	0	0	0	2,226.9
Unit 4	31	0	0	0	2,718.3
Unit 5	Unit off	Unit off	Unit off	Unit off	Unit off
Unit 6	Unit off	Unit off	Unit off	Unit off	Unit off
SUM	119	0	0	0	



High PM emissions can be attributed to unit light-up



Unit 3 high PM emissions on the 9th was due to 6 electrostatic precipitators fields kept tripping on pilot relay and CE rappers and precipitator conveyor 21 tripped



Unit 4 high PM emissions can be attributed to SO3 plant kept on tripping due high back end temperatures

Unit 4 high PM emissions can be attributed to ash backlogs which resulted in the poor performance of the ESP.

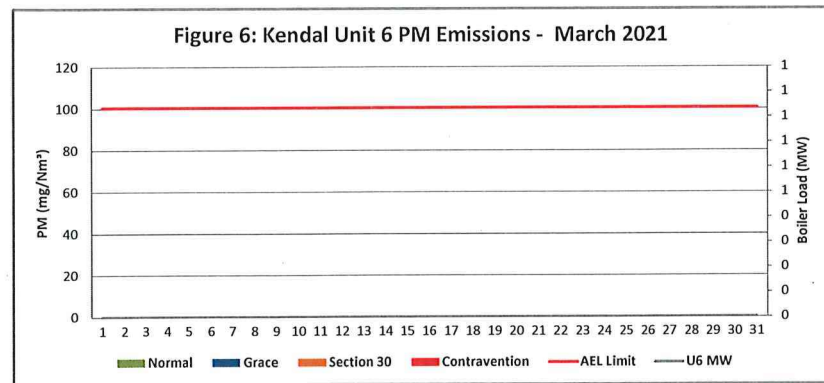
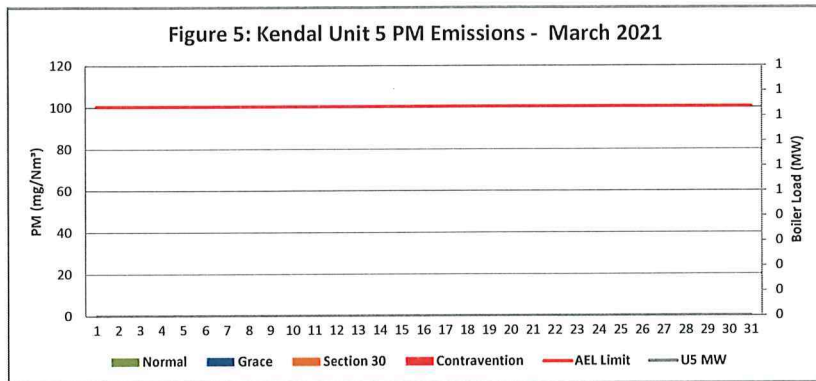


Figure 7: Kendal Unit 1 SOx Emissions - March 2021

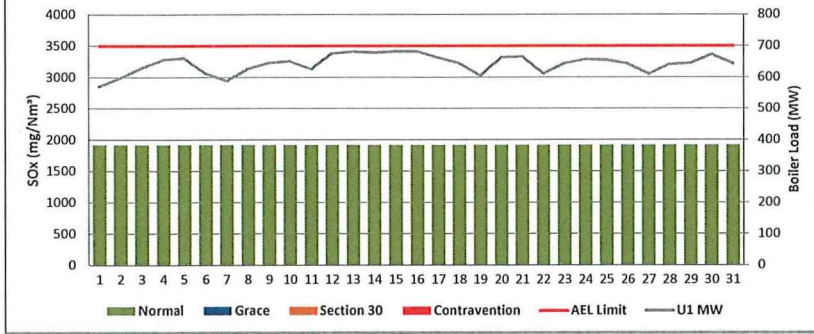


Figure 8: Kendal Unit 2 SOx Emissions - March 2021

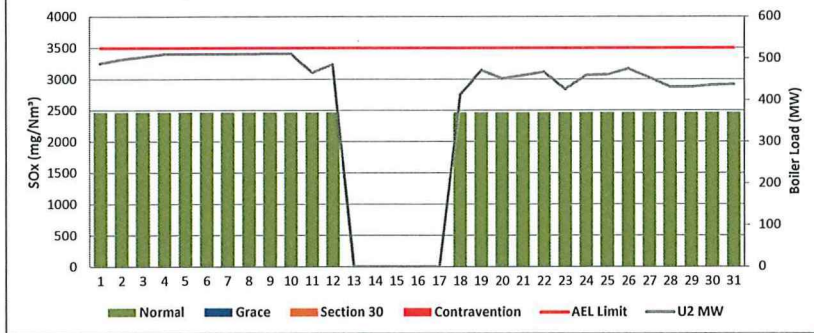


Figure 9: Kendal Unit 3 SOx Emissions - March 2021

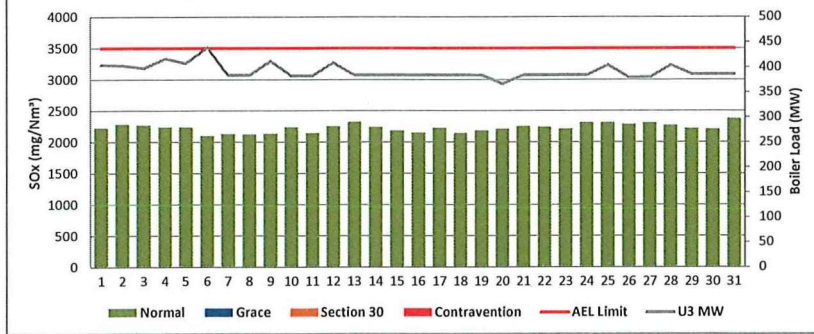




Figure 10: Kendal Unit 4 SOx Emissions - March 2021

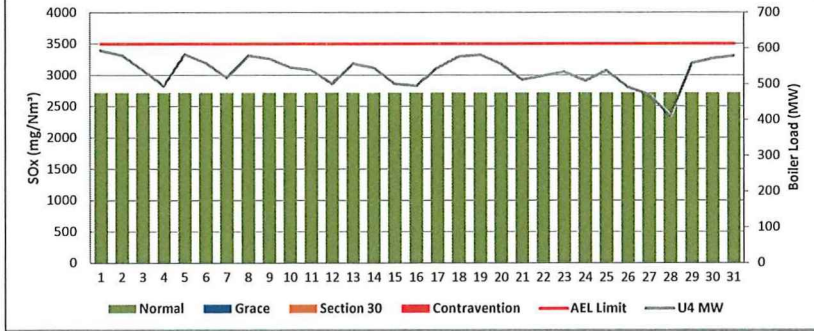


Figure 11: Kendal Unit 5 SOx Emissions - March 2021

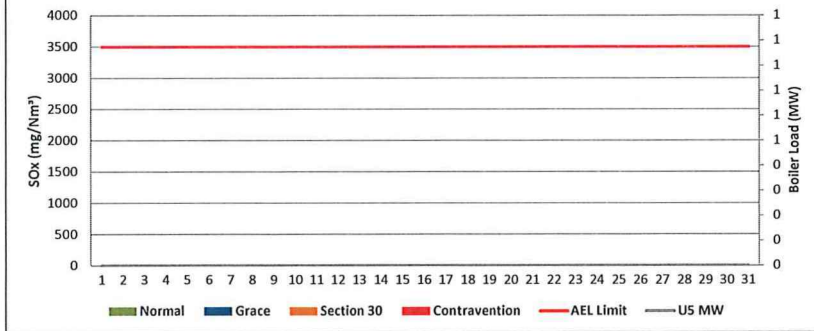


Figure 12: Kendal Unit 6 SOx Emissions - March 2021

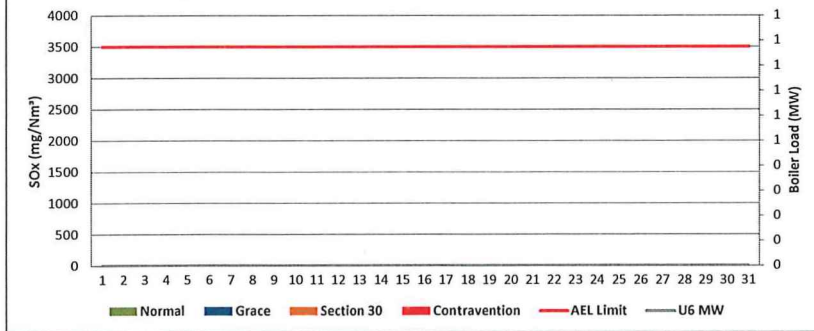


Figure 13: Kendal Unit 1 NOx Emissions - March 2021

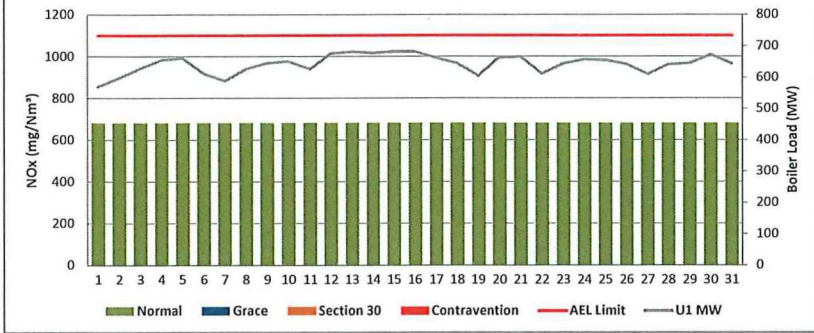


Figure 14: Kendal Unit 2 NOx Emissions - March 2021

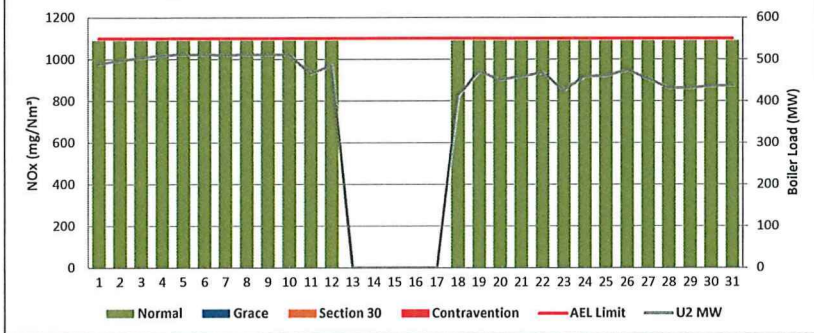
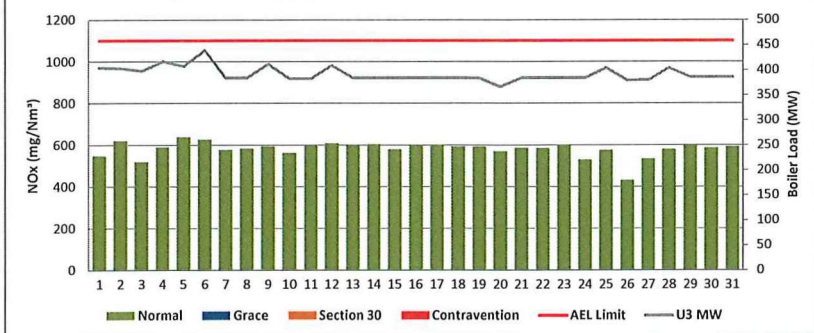
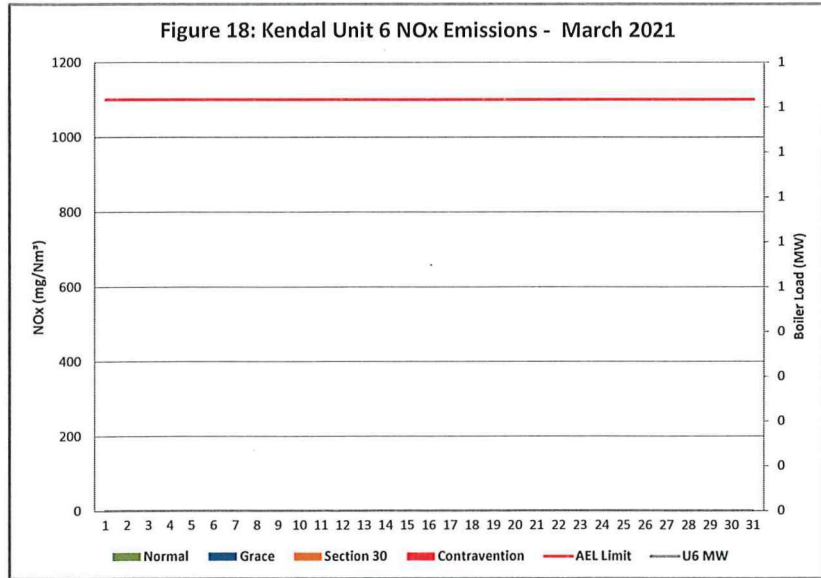
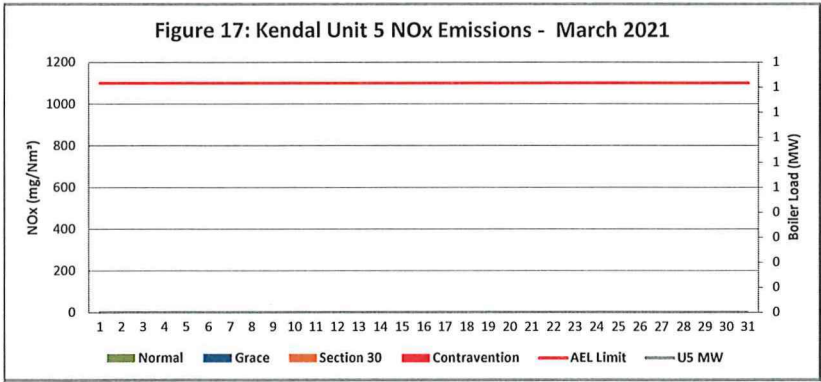
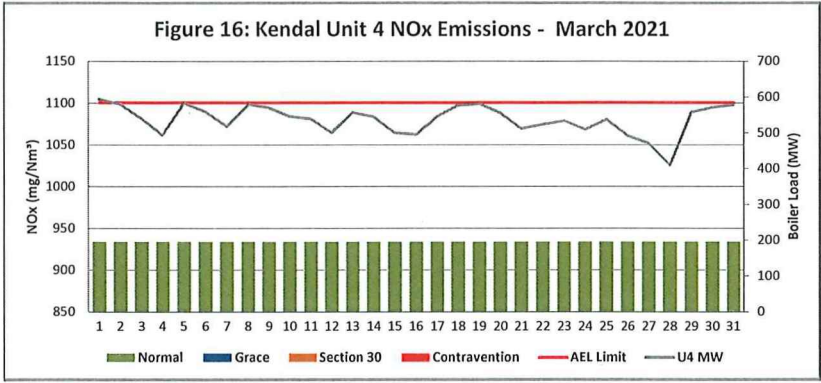


Figure 15: Kendal Unit 3 NOx Emissions - March 2021





7 COMMENTS

no complaints for this months

Source Code / Name	Root Cause Analysis	Calculation of impacts / emissions associated with the incident	Dispersion modeling of pollutants where applicable	Measures implemented to prevent reoccurrence

MONTHLY EMISSIONS REPORT

**Abatement Technology-Table 4**

In order to achieve the required operational dust removal efficiency based on measured values, several assumptions such as

- ☑ Coal ash content (%) and burnt rate mass
- ☑ Fly : Coarse ash ratio of 80:20 - 80% of fly-ash mass obtained from burnt coal goes to ESP
- ☑ Measurement of dust emission by Dust Monitor over a period of time (monthly)

Operational Dust Removal Efficiency

$$\eta = (1 - (\text{Output}/\text{Input})) \times 100$$

$$\eta = 1 - \frac{(\text{Dust Emission From AQR Report Dust Monitor (tons)})}{(\text{Coal Burnt (tons)} \times \% \text{Ash Content} \times 80\%)} \times 100$$

**Monitor Reliability-Table 5**

In terms of the minimum emissions standard, the requirement is that a monitor should be 80% reliable on a monthly average. The **monitor reliability** refers to **data reliability** because the assumed value of 98% reliability is compared to the dust concentration signal. If the dust concentration signal is above 98% opacity, the data information is no longer reliable because the monitor reading is out of its maximum reading range. The data reliability looks at how many times did the dust concentration signal go above 98% over a period of time e.g 24hours

The formula is as follows:

$$= (1 - (\text{count hours above 98\%/24hours})) \times 100$$

**Emissions Performance:**

- Note that gaseous emissions were manually entered using Independent third party QAL2 parallel test reports due to the unreliability of the CEMS monitors data, parallel tests completed and reports are still under review.
- Average velocity values from the latest correlation report were used on the gaseous emissions on Unit 1, 2, 3 & 4 due to defective CEMS monitors and velocity correction factors were set M=1 and C=0
- Units 5 & 6 were offload during this month for repairs to address emissions issues.

**Unit 2**  
**Findings:**  
 High PM emissions on the 18 can be attributed to unit light-up

**Unit 3**  
**Findings:**  
 Unit 3 high PM emissions on the 9th was due to 6 electrostatic precipitators fields kept tripping on pilot relay and CE rappers and precipitator conveyor 21 tripped  
**Resolution:** ESP to be repaired during opportunity maintenance and conveyor was repaired.

**Unit 4:**  
**Findings:** Unit 4 high PM emissions on the 15th can be attributed to SO3 plant kept on tripping due high back end temperatures and on the 23rd can be attributed to ash backlogs which resulted in the poor performance of the ESP.  
**Resolution:** SO3 plant was fixed and ash backlogs cleared as pe procedure.

tshilidzi24