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Date
06 April 2022

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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 FEBRUARY 2022.

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:

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ENVIRONMENTAL OFFICER- KENDAL

Date: 06/04/2022

Supported by:

Solly Chokoe
ENVIRONMENTAL MANAGER- KENDAL

Date: 07/04/2022

KENDAL POWER STATION'S EMISSIONS REPORT FOR THE MONTHS OF FEBRUARY 2022.

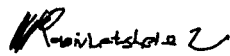
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Date 04/04/2022

Approved by:



Lukhanyo Ndube
GENERAL MANAGER-KENDAL

Date 14/04/2022

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 Feb-2022
	Coal	Tons	2 260 000	866 776
	Fuel Oil	Tons	5 000	2512.36
Production Rates	Product / By-Product Name	Units	Maximum Production Capacity Permitted	Production Rate Feb-2022
	Energy	GWh(MW)	4380	1 373 595.00
	Ash	Tons	770 000	295 570.6
	RE Ash	kg/MWh	not specified	0.420

2 ENERGY SOURCE CHARACTERISTICS

Coal Characteristic	Units	Stipulated Range	Monthly Average Content
Sulphur Content	%	<1 (%)	0.810
Ash Content	%	40 (%)	34.100

3 EMISSION LIMITS (mg/Nm³)

Associated Unit/Stack	PM	SO _x	NO _x
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 Feb-2022	Technology Type	Utilization Feb-2022
Unit 1	ESP + SO ₂	99.8%	SO ₂	0.0%
Unit 2	ESP + SO ₂	Off-line	SO ₂	Off-line
Unit 3	ESP + SO ₂	99.8%	SO ₂	0.0%
Unit 4	ESP + SO ₂	99.8%	SO ₂	0.0%
Unit 5	ESP + SO ₂	99.4%	SO ₂	0.0%
Unit 6	ESP + SO ₂	99.4%	SO ₂	0.0%

Unit 1, 2, 3, 4, 5 & 6 sulphur utilization readings not available because KEPDATA04 and KEPDATA05 failed. The hardware is being replaced

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

5 MONITOR RELIABILITY (%)

Associated Unit/Stack	PM	SO ₂	NO	O ₂
Unit 1	99.5	99.1	97.8	98.3
Unit 2	Off-line	Off-line	Off-line	Off-line
Unit 3	100.0	30.0	26.9	99.3
Unit 4	94.0	100.0	100.0	99.4
Unit 5	93.1	93.6	93.6	100.0
Unit 6	88.2	22.6	0.0	0.0

Note: NOx emissions is measured as NO in PPM. Final NOx value is expressed as total NO₂

Note: Unit 3 and 6 monitor reliability was low because of the monitors that were defective

6 EMISSION PERFORMANCE

Table 6.1: Monthly tonnages for the month of February 2022

Associated Unit/Stack	PM (tons)	SO ₂ (tons)	NO _x (tons)	CO ₂
Unit 1	109.2	3 134	958	225 818
Unit 2	Off-line	Off-line	Off-line	Off-line
Unit 3	53.4	3 383	1 125	288 647
Unit 4	98.5	2 565	654	156 855
Unit 5	306.7	3 554	1 192	401 983
Unit 6	274.8	2 719	1 086	277 680
SUM	842.69	15 356	5 015	1 350 983

Table 6.2: Operating days in compliance to PM AEL Limit - February 2022

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average PM (mg/Nm ³)
Unit 1	26	2	0	0	2	60.2
Unit 2	Off-line	Off-line	Off-line	Off-line	Off-line	Off-line
Unit 3	23	0	0	0	0	52.0
Unit 4	24	2	0	2	4	76.6
Unit 5	14	8	0	3	17	177.6
Unit 6	5	5	0	12	17	228.0
SUM	92	17	0	17	40	

Table 6.3: Operating days in compliance to SOx AEL Limit - February 2022

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average SOx (mg/Nm ³)
Unit 1	26	0	0	0	0	3 075.7
Unit 2	Off-line	Off-line	Off-line	Off-line	Off-line	Off-line
Unit 3	24	0	0	0	0	2 062.7
Unit 4	28	0	0	0	0	2 223.1
Unit 5	26	0	0	0	0	2 155.6
Unit 6	24	0	0	0	0	2 549.7
SUM	130	0	0	0	0	

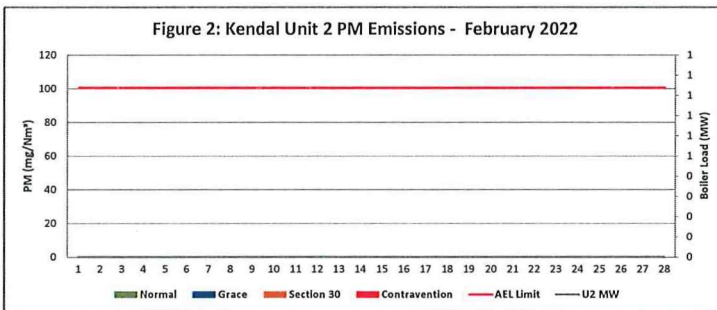
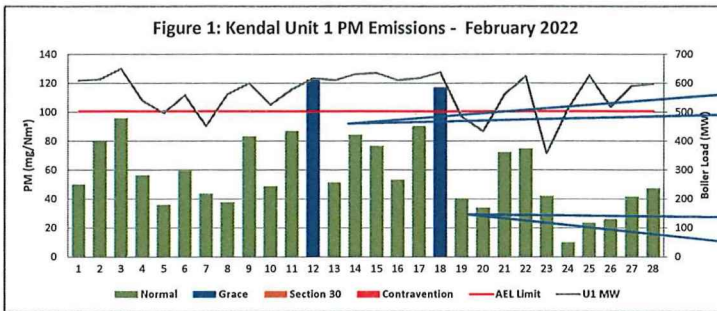
Table 6.4: Operating days in compliance to NOx AEL Limit - February 2022

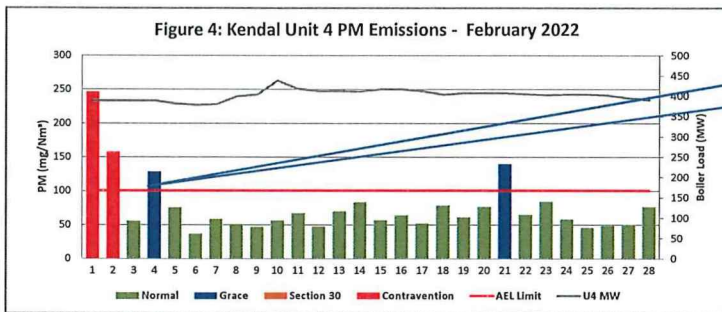
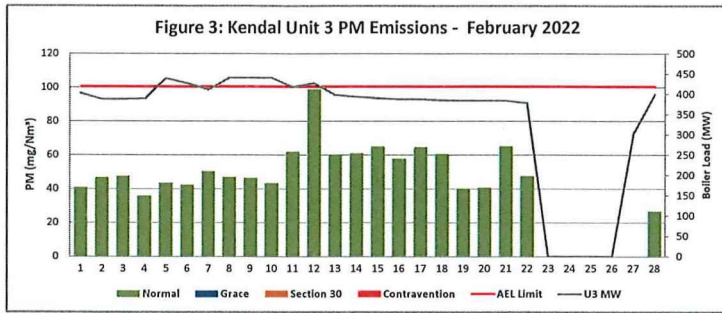
Associated Unit/Stack	Normal	Grace	Section 30	Contra-vention	Total Exceedance	Average NOx (mg/Nm ³)
Unit 1	28	0	0	0	0	944.4
Unit 2	0	Off-line	Off-line	Off-line	Off-line	Off-line
Unit 3	24	0	0	0	0	679.9
Unit 4	28	0	0	0	0	568.3
Unit 5	26	0	0	0	0	723.8
Unit 6	24	0	0	0	0	1 020.8
SUM	130	0	0	0	0	

Note: NOx emissions is measured as NO in PPM. Final NOx value is expressed as total NO₂

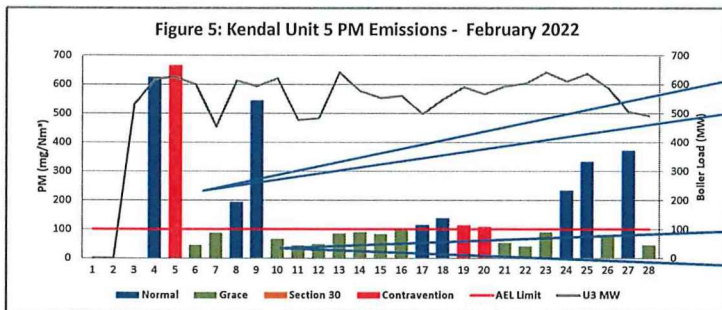
Table 6.5: Legend Description

Condition	Colour	Description
Normal	Green	Emissions below Emission Limit Value (ELV)
Grace	Blue	Emissions above the ELV during grace period
Section 30	Orange	Emissions above ELV during a NEMA S30 incident
Contravention	Red	Emissions above ELV but outside grace or S30 incident conditions



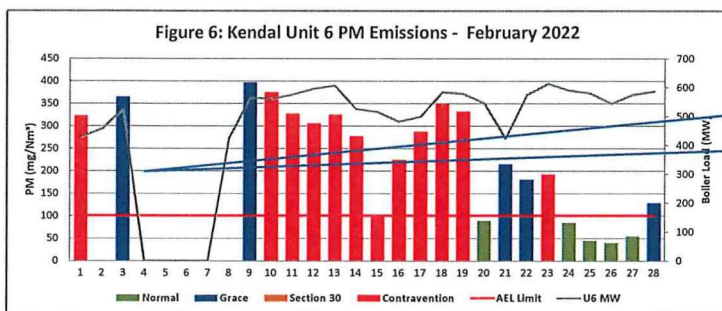


High PM emissions can be attributed to DHP tripped and hoppers knife gates closed due to compartment levels full,

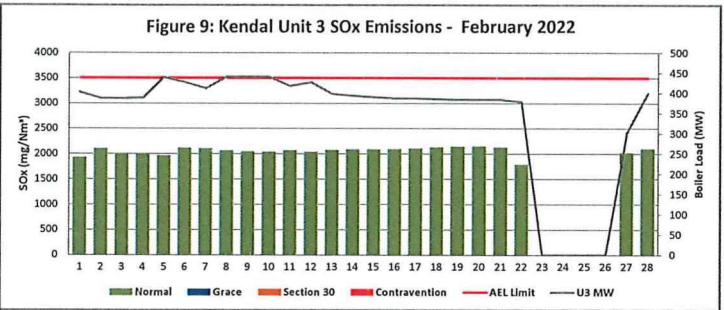
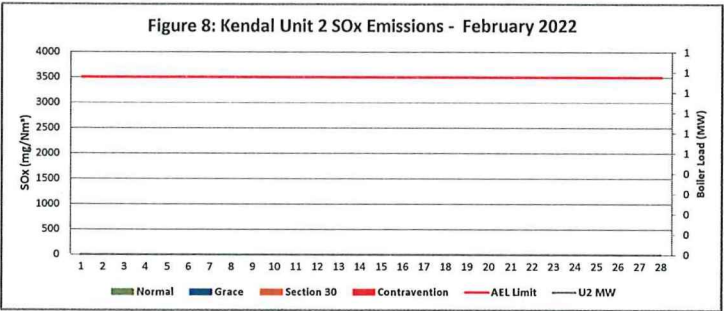
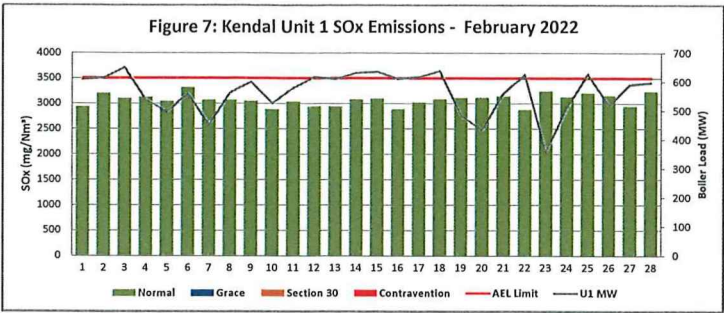


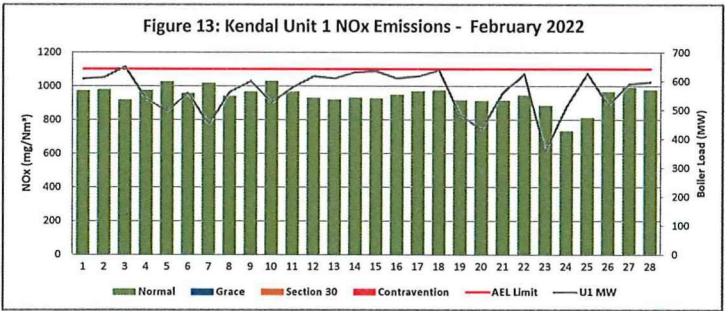
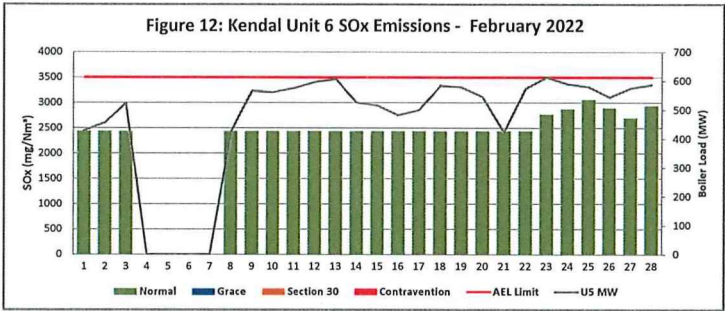
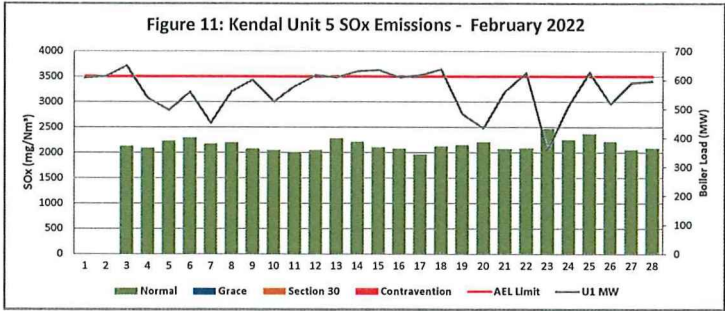
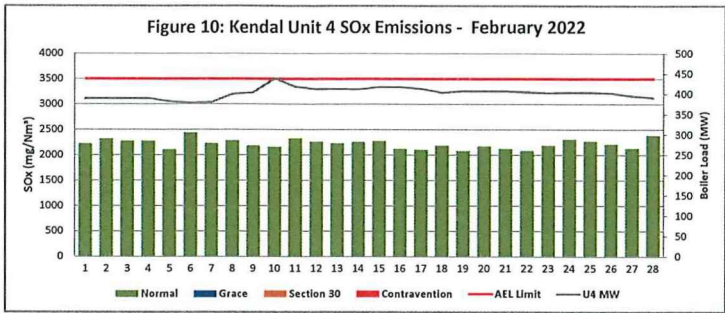
High PM emissions on the 4th and the 05th can be attributed to light up conditions, DHP was out of service due to high compartment 10 levels. On the 08th SO3 plant on hold mode due to faulty converter, DHP off due full compartments & conveyors 14 & 21 tripping

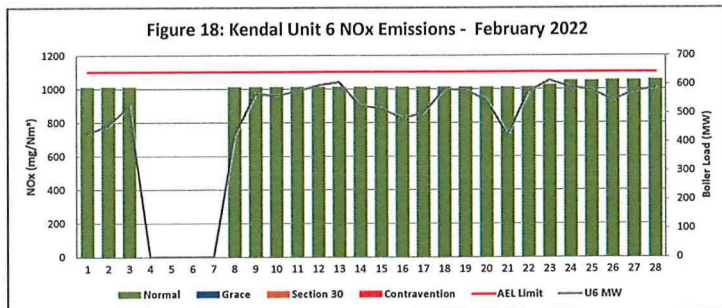
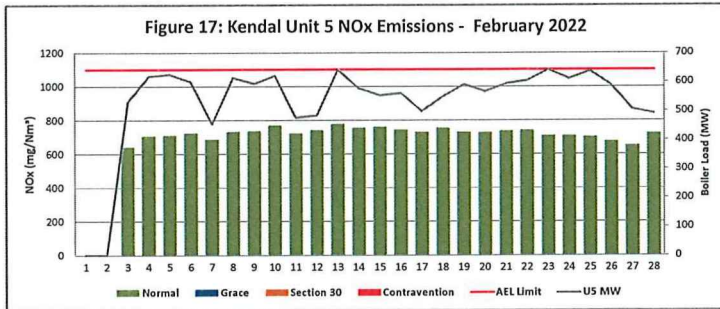
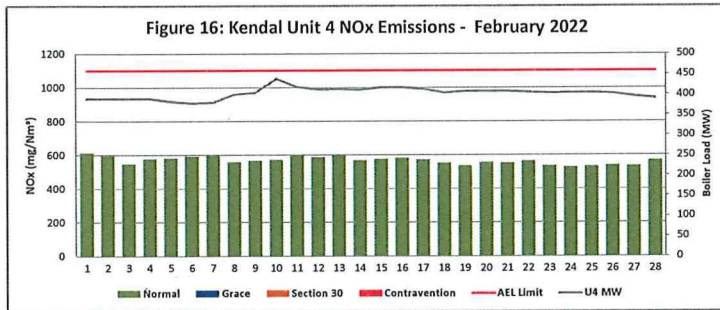
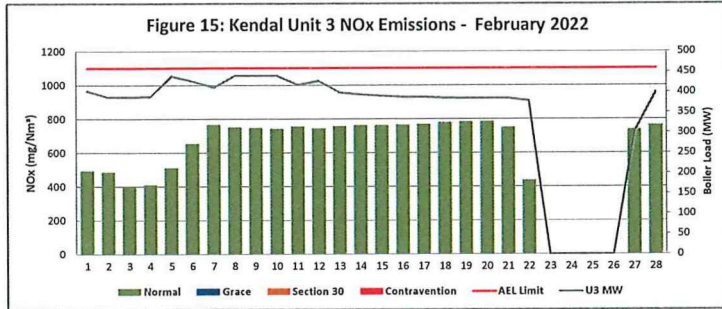
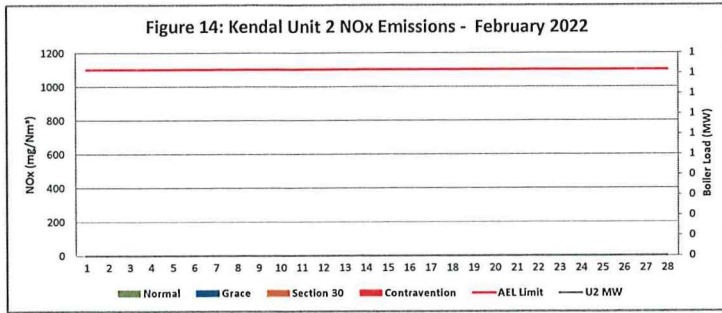
High PM emissions on 8 & 9 can be attributed to DHP tripped and hoppers knife gates closed due to compartment levels full. On the 17th to 20th emissions were high due to DHP off, compartments levels high, hoppers knife gates checked in, precip fields 11 & 21 kept on tripping. On the 24th and 25 emissions were high because of the 380V Isolator replacement on precip board



The high PM emissions on the 01st can attributed to DHP off because of both streams not available and light up conditions on the 03rd and on the 09th. From the 10th until the 19th precip conveyor 11 blocked, knife gates closed on the right hand side, hoppers full, DHP off, compartments full







7 COMPLAINTS

There were no complaints for this months

Description of complaint	Person receiving complaint	Source Code / Name	Root Cause Analysis	Calculation of Impacts / emissions associated with	Dispersion modeling of pollutants where applicable

ADDENDUM TO 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

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

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

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. 24 hours. The formula is as follows:

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

Emissions Performance

- 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
- Average emissions for Unit 3 SOx & NOxOAL2 test results were used and temp, pressure and velocity correlation tests results were used because the monitors were defective
- Average emissions were used from the QAL2 parallel report for unit 4 CO2. Unit 6 all gaseous monitors reliability was also low because of the monitors that were defective, average emissions were also used from the QAL2 parallel tests report
- Unit 2 was off load

Unit 1

Findings: Unit 1 High PM emissions on the 12th can be attributed to precip conveyor 21 out of service due to gear box and on the 18th Precip conv 13 tripping on speed switch.
Resolution: The plant was repaired.

Unit 4

Findings: High PM emissions on the 01st and 02nd can be attributed to DHP that tripped and hoppers knife gates closed due to compartment levels full.
Resolution: The DHP was returned back to service after repairs and ash backlogs were cleared.

Unit 5

Findings: High PM emissions on the 4th and the 05th can be attributed to light up conditions, DHP was out of service due to high compartment 10 levels. On the 08th SO3 plant on hold mode due to faulty converter, DHP off due full compartments & conveyors 14 & 21 tripping. On the 8th & 9th high emissions can be attributed to DHP tripping and hoppers knife gates closed due to compartment levels full. On the 17th to 20th emissions were high due to DHP off, compartments levels high, hoppers knife gates checked in, precip fields 11 & 21 kept on tripping. On the 24th and 25 emissions were high because of the 380V isolator replacement on precip board.
Resolution: The DHP and SO3 plant were returned back to service after repairs and ash backlogs were cleared.

Unit 6

Findings: The high PM emissions on the 01st can attributed to DHP off because of both streams not available and light up conditions on the 03rd and on the 09th. From the 10th until the 19th precip conveyor 11 blocked knife gates closed on the right hand side, hoppers full, DHP off, compartments full.
Resolution: The DHP was returned back to service after repairs and ash backlogs were cleared.