



**Ms Nompumelelo Simelane**  
Nkangala District Municipality  
PO Box 437  
Middleburg  
1050

Date:

*April 2024*

Enquiries: Lesiba Kgobe  
Tel: +27 13 699 7817

Ref: *Kusile Power Station AEL (17/4/AEL/MP311/12/01)*

Dear Ms. Simelane

**KUSILE POWER STATION'S MONTHLY EMISSIONS REPORT FOR DECEMBER 2023 REV 02.**

Resubmission of monthly emissions report for December 2023.

Hoping the above will meet your satisfaction.

Yours sincerely

Christopher Nani  
**ACTING GENERAL MANAGER**

DATE: *25/4/2024*

## 1. KUSILE POWER STATION MONTHLY EMISSIONS REPORT: Atmospheric Emission License 17/4/AEL/MP311/12/01



## 2 Raw Materials and Products

Raw Materials and Products	Raw Material Type	Units	Max Permitted Consumption Rate	Consumption Rate Dec-2023
	Coal	Tons	1 818 083	713 174
	Fuel Oil	Tons	5 533	3 798.61
	Limestone	Tons	72 917	4038
Production Rates	Product / By-Product Name	Units	Max Production Capacity Permitted	Indicative Production Rate Dec-2023
	Energy	GWh	3 321.216	1 359.279
	Ash	Tons	663 583	226 646.788
	Gypsum	Tons	129 250	2 261.280
	RE PM	kg/MWh	not specified	0.119
	RE SO <sub>2</sub>	kg/MWh	not specified	4.948

## 3 Energy source characteristics

Fuel Characteristic	Units	Stipulated Range	Monthly Average Content
Coal Sulphur	%	1.3	0.790
Ash in Coal	%	38	31.780
Fuel Oil Sulphur	%	3.5	2.500
Ash in FO	%	0.02	0.020

#### 4 Emissions Limits (mg/Nm<sup>3</sup>)

Associated Unit/Stack	PM	SO <sub>2</sub>	NO <sub>x</sub>
East	50	3500	750
West	50	1000	750

#### 5 Abatement Technology (%)

Associated Unit/Stack	Technology Type	Efficiency Dec-2023	Utilisation Dec - 2023	Technology Type	Efficiency Dec-2023	Utilisation Dec- 2023
Unit 1	FFP	99.907%	100%	FGD	Out of service	Out of service
Unit 2	FFP	99.993%	100%	FGD	Out of service	Out of service
Unit 3	FFP	99.823%	100%	FGD	Out of service	Out of service
Unit 4	FFP	99.985%	100%	FGD	99.978%	100%

Note: Both the FFP and FGD does not have bypass mode operation, hence plant 100% Utilised.

#### 6. Monitoring reliability (%)

Associated Unit/Stack	PM	SO <sub>2</sub>	NO
Unit 1	100.0	100.0	100.0
Unit 2	100.0	99.6	99.4
Unit 3	100.0	99.3	99.3
Unit 4	100.0	98.8	99.8

#### 7. Emissions Performance

Table 7.1: Monthly tonnages for the month of December - 2023

Associated Unit/Stack	PM	SO <sub>2</sub>	NO <sub>x</sub>
Unit 1	44.2	2 510	656
Unit 2	3.7	1 576	420
Unit 3	106.6	2 591	926
Unit 4	6.8	48	778
SUM	161.2	6 725	2 780



Table 7.2: Operating days in compliance to PM AEL Limit - December 2023

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average PM (mg/Nm³)
Unit 1	21	1	0	0	1	26.5
Unit 2	26	0	0	0	0	3.2
Unit 3	9	0	0	20	20	62.2
Unit 4	27	0	0	0	0	4.6
<b>SUM</b>	<b>83</b>	<b>1</b>	<b>0</b>	<b>20</b>	<b>21</b>	

Table 7.3: Operating days in compliance to SO<sub>2</sub> AEL Limit – December 2023

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average SO <sub>2</sub> (mg/Nm³)
Unit 1	25	0	0	0	0	1 424.6
Unit 2	28	0	0	0	0	1 391.2
Unit 3	31	0	0	0	0	1 361.2
Unit 4	27	0	0	0	0	31.8
<b>SUM</b>	<b>111</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	

Table 7.4: Operating days in compliance to NO<sub>x</sub> AEL Limit –December 2023

Associate d Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average NO <sub>x</sub> (mg/Nm³)
Unit 1	25	0	0	0	0	366.6
Unit 2	28	0	0	0	0	361.0
Unit 3	31	0	0	0	0	486.8
Unit 4	27	0	0	0	0	520.2
<b>SUM</b>	<b>111</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	

Table 7.5: Legend Description

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

Figure 1: Kusile Unit 1 PM Emissions - December 2023

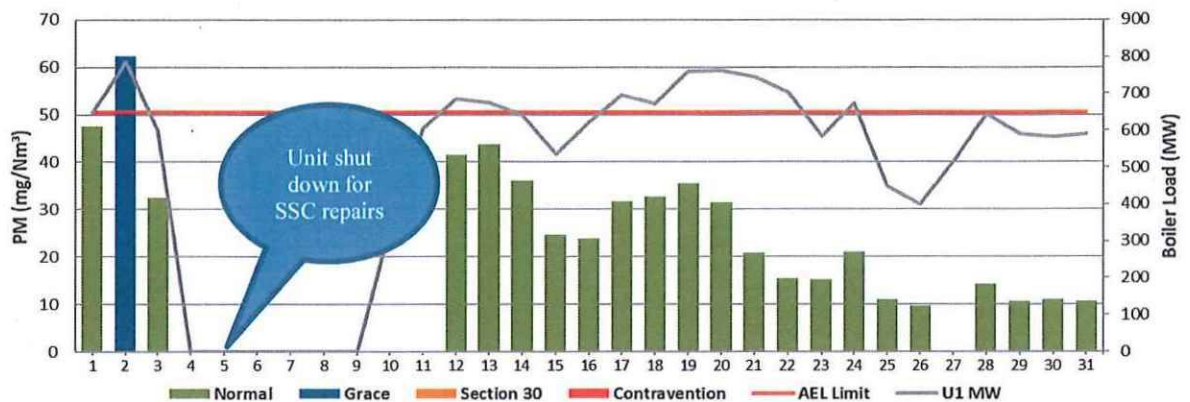


Figure 2: Kusile Unit 2 PM Emissions - December 2023

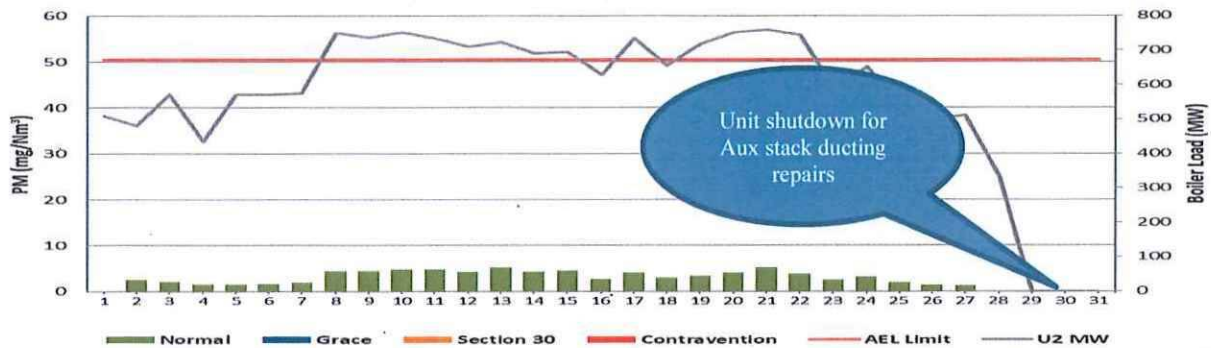


Figure 3: Kusile Unit 3 PM Emissions - December 2023

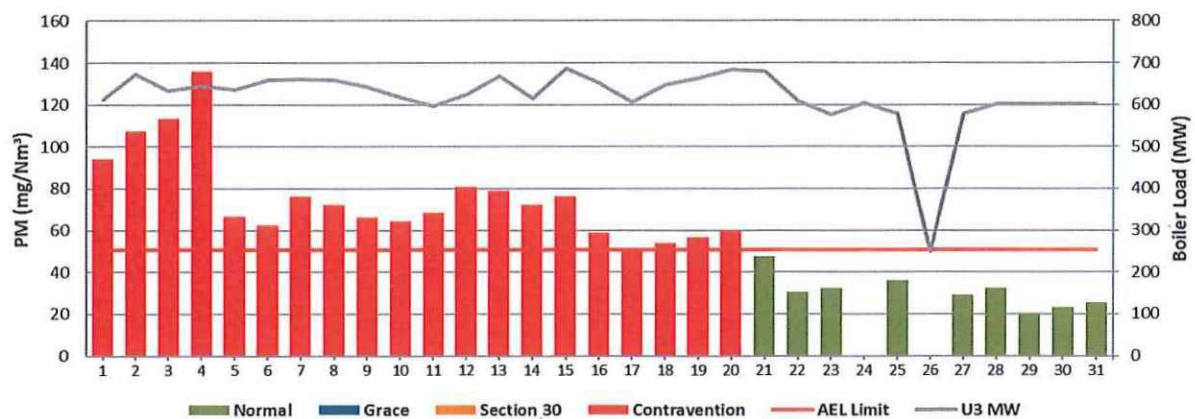


Figure 4: Kusile Unit 4 PM Emissions - December 2023

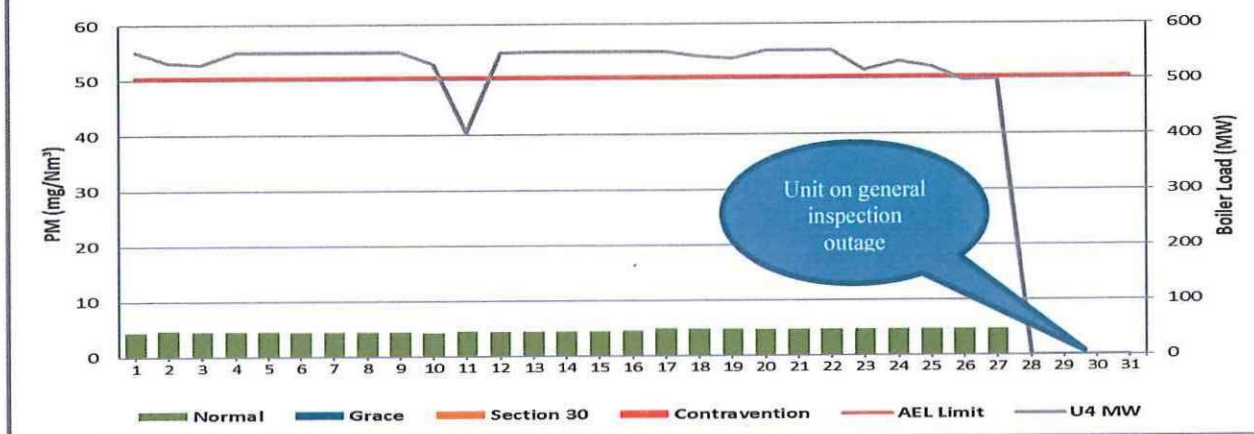


Figure 5: Kusile Unit 1 SO<sub>2</sub> Emissions - December 2023

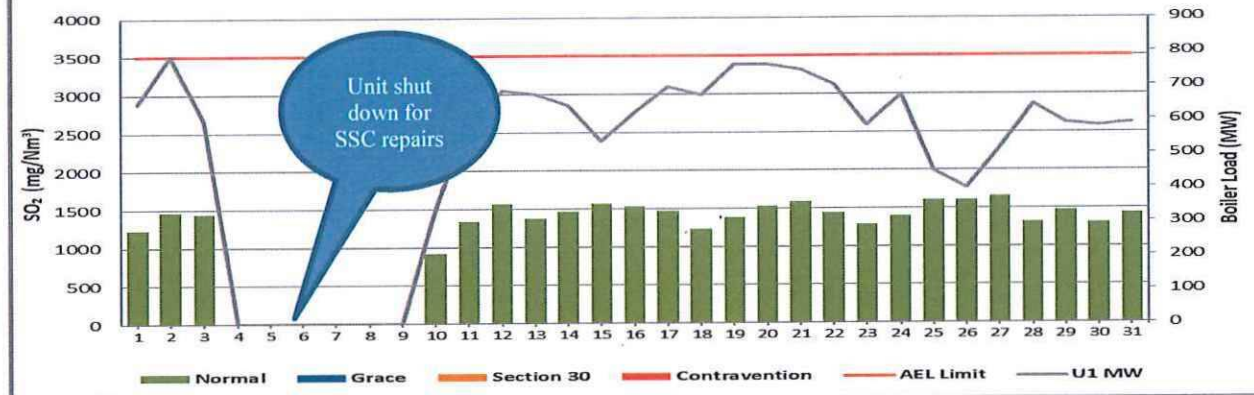
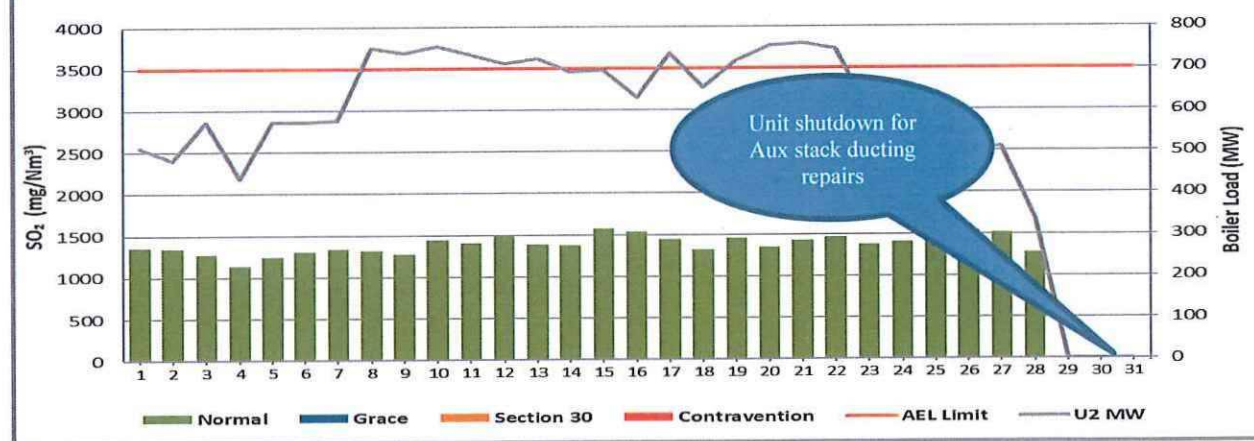
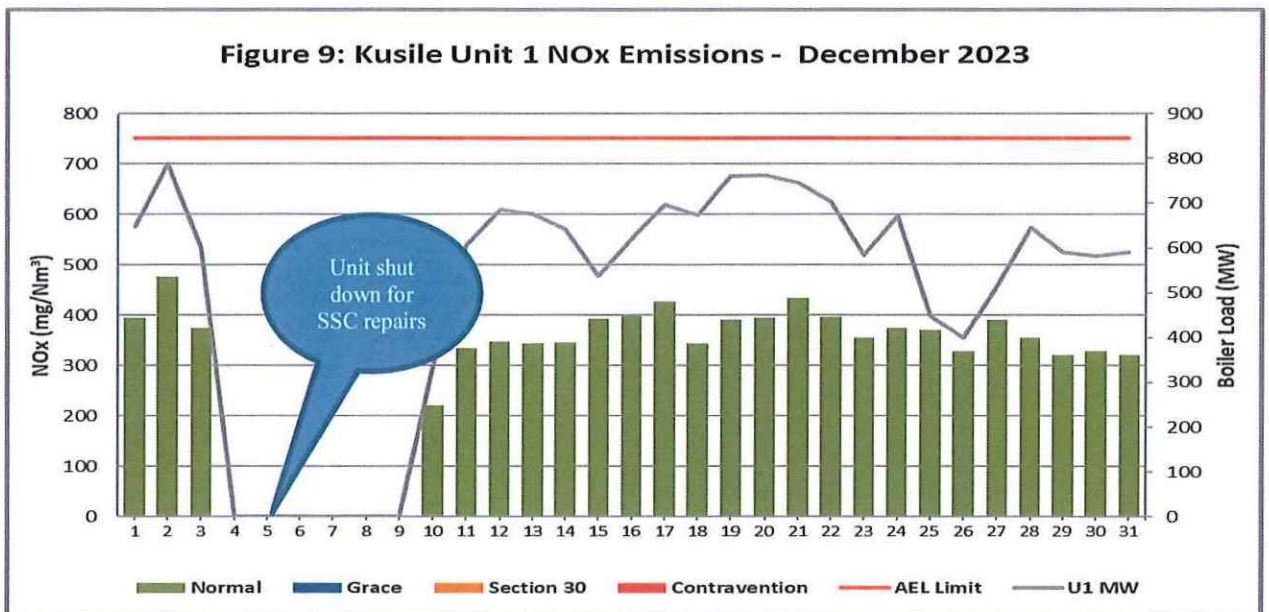
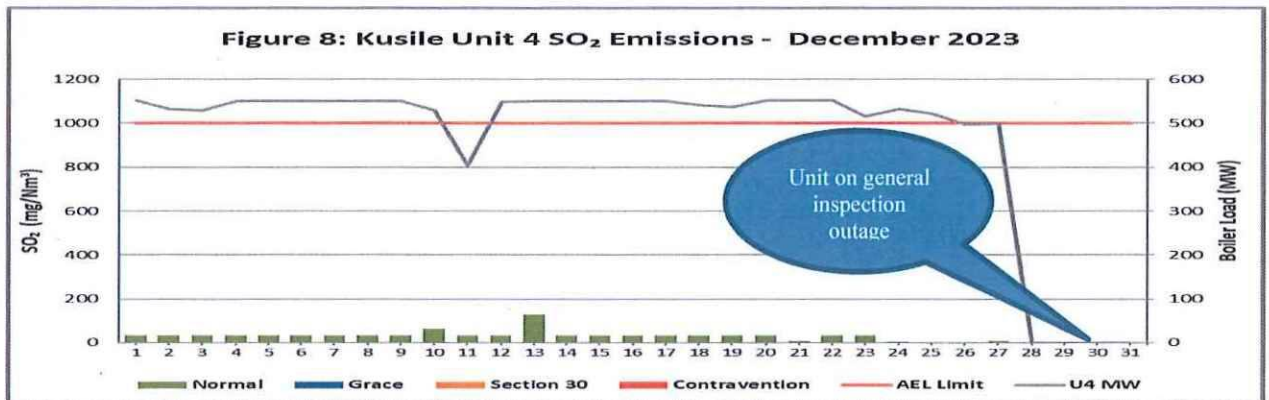
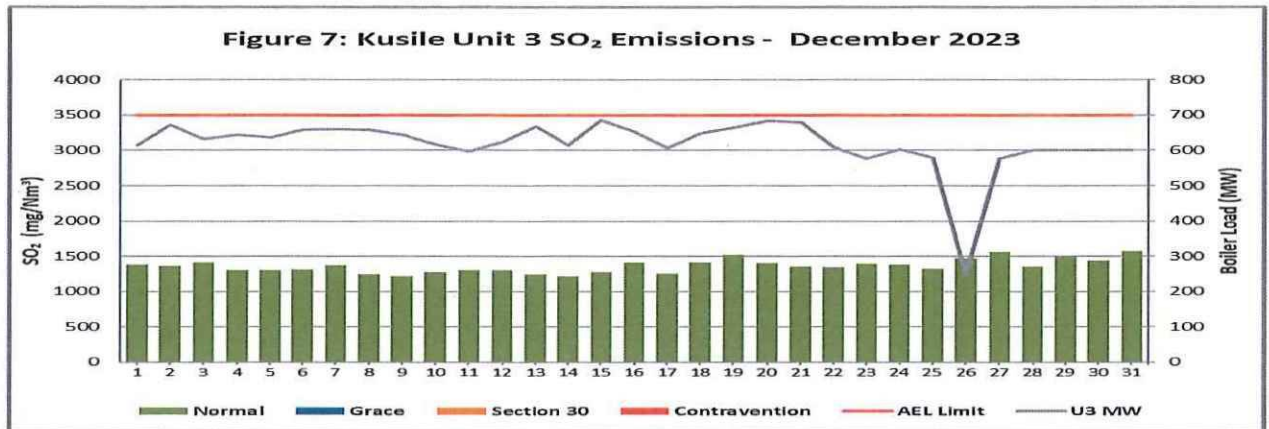
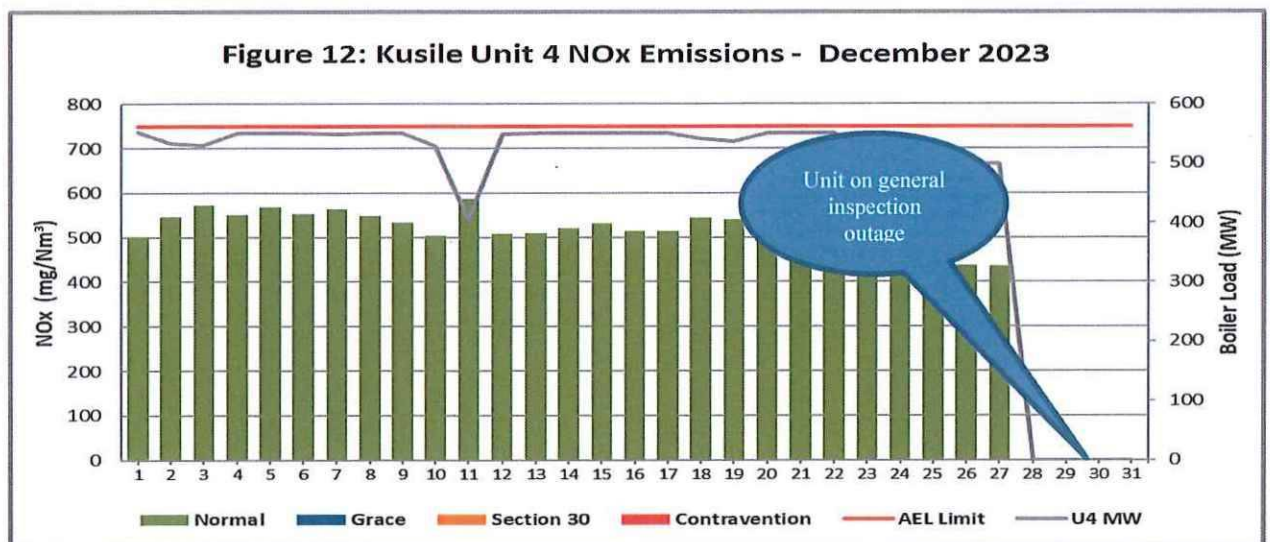
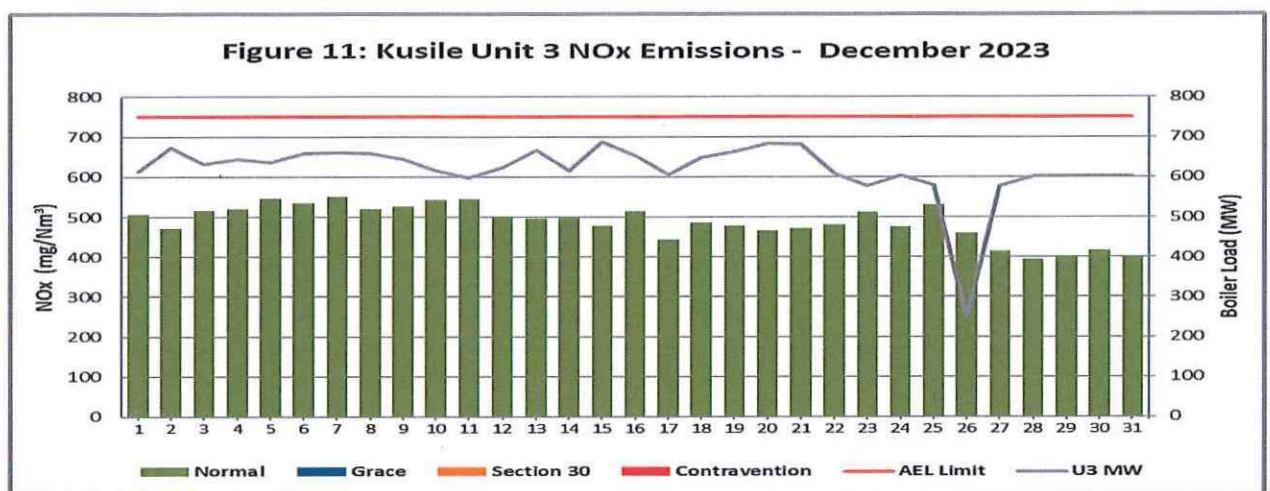
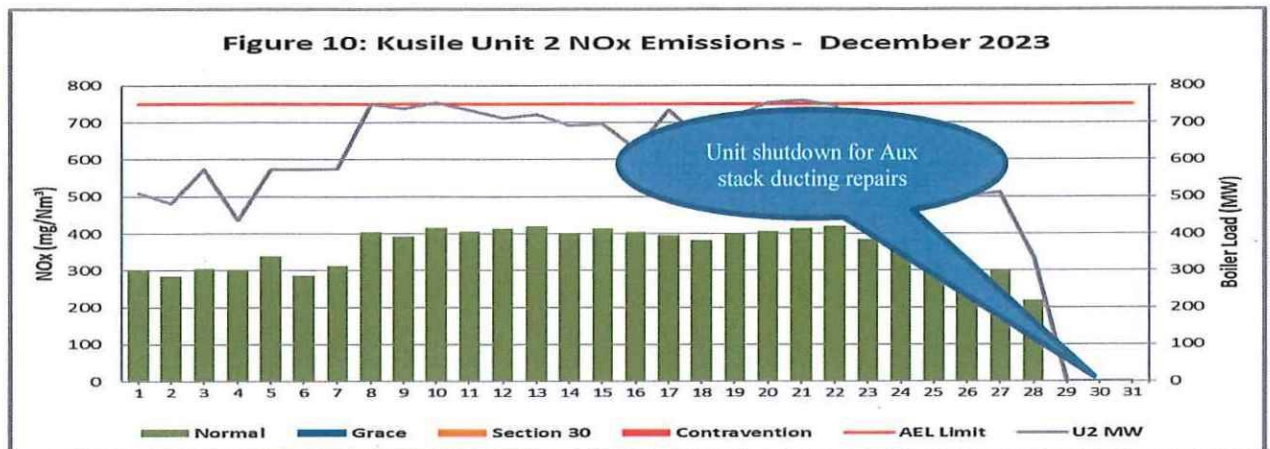


Figure 6: Kusile Unit 2 SO<sub>2</sub> Emissions - December 2023











## 8. Shut down and Light up information

Unit No. 1	Event 1		Event 2	
Breaker Open (BO)	1:05 pm	2023/12/03	2:50 pm	2023/12/26
Draught Group (DG) Shut Down (SD)	7:50 am	2023/12/04	10:25 pm	2023/12/26
BO to DG SD (duration)	00:18:45	DD:HH:MM	00:07:35	DD:HH:MM
Fires in time	3:10 am	2023/12/11	11:15 pm	2023/12/26
Synch. to Grid (or BC)	7:15 am	2023/12/11	12:30 pm	2023/12/27
Fires in to BC (duration)	00:04:05	DD:HH:MM	00:13:15	DD:HH:MM
Emissions below limit from BC (end date)	not > limit	not > limit	not > limit	not > limit
Emissions below limit from BC (duration)	n/a	DD:HH:MM	n/a	DD:HH:MM

Unit No. 2	Event 1		Event 2	
Breaker Open (BO)	BO previously	BO previously	9:45 pm	2023/12/27
Draught Group (DG) Shut Down (SD)	n/a	n/a	9:30 am	2023/12/29
BO to DG SD (duration)	n/a	DD:HH:MM	01:11:45	DD:HH:MM
Fires in time	9:30 am	2023/12/01	2:35 pm	2024/01/01
Synch. to Grid (or BC)	5:00 pm	2023/12/01	5:40 pm	2024/01/01
Fires in to BC (duration)	00:07:30	DD:HH:MM	00:03:05	DD:HH:MM
Emissions below limit from BC (end date)	not > limit	not > limit	not > limit	not > limit
Emissions below limit from BC (duration)	n/a	DD:HH:MM	n/a	DD:HH:MM

KUSILE POWER STATION'S MONTHLY EMISSIONS REPORT FOR DECEMBER 2023 REV 02 - 17/4/AEL/MP311/12/01

Unit No. 3	Event 1		Event 2		Event 3		Event 4	
Breaker Open (BO)	1:45 pm	2023/12/14	11:55 pm	2023/12/16	1:55 am	2023/12/22	1:25 pm	2023/12/23
Draught Group (DG) Shut Down (SD)	DG did not trip or SD	DG did not trip or SD	DG did not trip or SD	DG did not trip or SD	2:05 am	2023/12/22	DG did not trip or SD	DG did not trip or SD
BO to DG SD (duration)	n/a	DD:HH:MM	n/a	DD:HH:MM	00:00:10	DD:HH:MM	n/a	DD:HH:MM
Fires in time	4:30 pm	2023/12/14	2:45 am	2023/12/17	3:20 am	2023/12/22	2:30 pm	2023/12/23
Synch. to Grid (or BC)	8:30 pm	2023/12/14	9:10 am	2023/12/17	8:05 am	2023/12/22	1:25 am	2023/12/24
Fires in to BC (duration)	00:04:00	DD:HH:MM	00:06:25	DD:HH:MM	00:04:45	DD:HH:MM	00:10:55	DD:HH:MM
Emissions below limit from BC (end date)	not > limit	not > limit	not > limit	not > limit	not > limit	not > limit	not > limit	not > limit
Emissions below limit from BC (duration)	n/a	DD:HH:MM	n/a	DD:HH:MM	n/a	DD:HH:MM	n/a	DD:HH:MM

Unit No. 4	Event 1	
Breaker Open (BO)	9:15 pm	2023/12/27
Draught Group (DG) Shut Down (SD)	10:25 am	2023/12/28
BO to DG SD (duration)	00:13:10	DD:HH:MM
Fires in time		
Synch. to Grid (or BC)		
Fires in to BC (duration)		DD:HH:MM
Emissions below limit from BC (end date)		
Emissions below limit from BC (duration)		DD:HH:MM

## 9. Complaints

Date and time complaint was received	Complaint received	Source code name	Root cause analysis	Calculation of impact/emissions associated with incidents and dispersion modelling of pollutants where applicable.	Measures implemented or to be implemented to prevent recurrence	Date by which measures will be implemented
No complaints reported for the month of December 2023						

## 10. Sec 30 incident or legal contravention register

To be completed in the case of a Sec 30 incident or a legal contravention

Unit no	Incident start date	Incident end date	Incident cause	Remedial actions	Sec 30 notification report sent	Date DFFE Acknowledged	Date DFFE Accepted	Comments/Ref No
Unit 3	01/12/2023	31/12/2023	<ul style="list-style-type: none"> <li>Only indicative values were available resulting in the station unable to activate the high dust emission response procedure, due lack correlated data.</li> <li>The first 1000-1200 operational hours are associated with high emissions. The material fibres for the installed bag set are 100% PPS and did not assist with the reduction of PM that is provided by the PI or P84 fibre.</li> <li>PM concentration is affected by cleaning system parameters and exposure to high DP.</li> <li>Online cell inspection was ongoing based on cell dust flow meters trends. This was effective in reducing dust from damaged bags but ineffective in reducing high dust concentrations associated with bleed through.</li> </ul>	<ul style="list-style-type: none"> <li>Spot checks are to be done on units during the next CEMS installation while awaiting correlations for implementation of a preliminary curve. This will allow for the operator to have values to monitor and action while awaiting test.</li> <li>Cleaning system setting DP used to start the pulse cleaning will be increased to 1.5kPa from 1.3kPa for a new bag set. In addition to this, the maximum pulse cleaning pressure setting will be limited to 500kPa instead of 600kPa to prevent disturbance of the primary ash cake.</li> <li>The specification for the PPS shall be that used at Kusile going forward will include the PI or P84 fibre final layer.</li> <li>Online bag replacements shall continue as required by the system for PM concentration management.</li> </ul>	Not applicable Exceedances not reported as Sec 30 incidents. The exceedances were noted after retrofitting of data and therefore reported as legal contraventions.			Refer to attached investigation report