

Mr Dan Hlanyane  
 Senior Manager Municipal Health & Environmental Services  
 Gert Sibande District Municipality  
 PO BOX 3016  
 ERMELO  
 2350

Date: 11 April 2023

Enquiries: Johan Swanepoel  
 Tel +27 17 799 2047

## MAJUBA POWER STATION'S MONTHLY EMISSIONS REPORT FOR THE MONTH OF MARCH 2023

This serves as the monthly report required in terms of Majuba Power Station's Atmospheric Emission License (MPS/0014/2019/F03) under section 7 routine reporting and record keeping. The emissions are for the month of March 2023. Verified emissions of particulates are included. SO<sub>2</sub> and NO<sub>x</sub> (as NO<sub>2</sub>) emissions are included for all units. Greenhouse gasses are excluded as per the agreement reached between Eskom and the Department of Environmental, Forestry and Fisheries in the first quarter of 2017/18 financial year's MINTEC and MINMEC management meeting.

### Raw Materials and Products

**Table 1. Quantity of Raw Materials and Products used/produced for the month of March 2023**

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption/ Rate in Month of March 2023
	Coal	Tons/month	1 800 000	927107
	Fuel Oil	Tons/month	6 000	12 358.8
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity - MW)	Production Rate in Month of March 2023
	Energy	GWh	4 110	1502.75
	Ash	Tons/month	Not stated in the license	297 972.19

### Abatement Technology

**Table 2. Abatement Equipment Control Technology for the month of March 2023**

Associated Unit	Technology Type	Actual Utilisation (%) for the month of March 2023	*Minimum Control Efficiency (%)
Unit 1	Fabric Filter Plant	100	99.90
Unit 2	Fabric Filter Plant	100	99.90
Unit 3	Fabric Filter Plant	100	99.93
Unit 4	Fabric Filter Plant	100	99.86
Unit 5	Fabric Filter Plant	100	99.90
Unit 6	Fabric Filter Plant	100	99.93

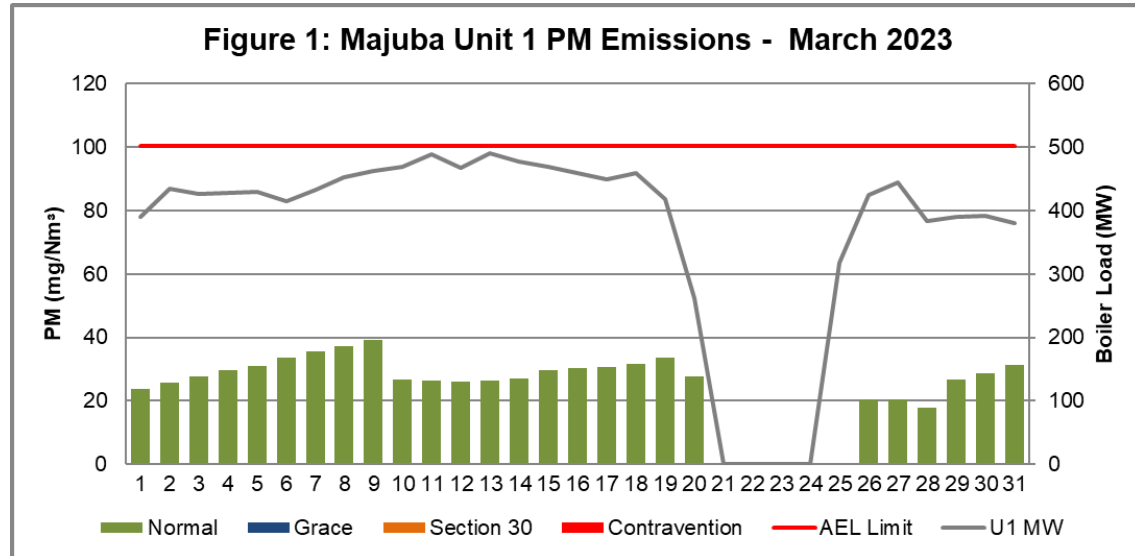
\*Calculated from the assumption of 90% fly ash to 10% bottom ash and percentage ash as measured in coal.

### Energy Source Characteristics

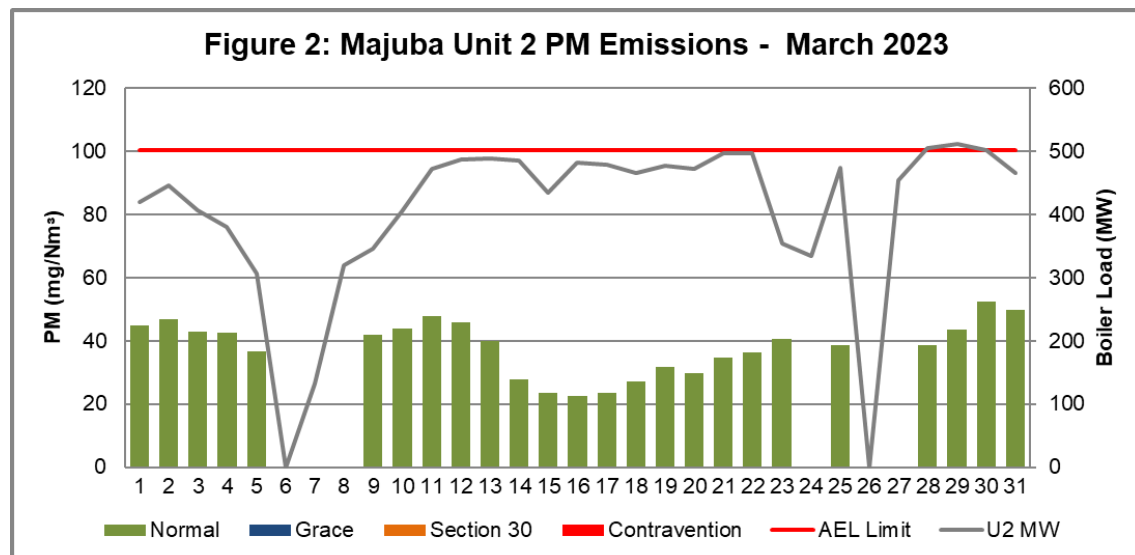
**Table 3. Energy Source Material Characteristics for the month of March 2023**

Characteristic	Stipulated Range (Unit)	Monthly Average Content
Sulphur Content	0.6 to >0.94%	0.69
Ash Content	28 to >30%	32.14

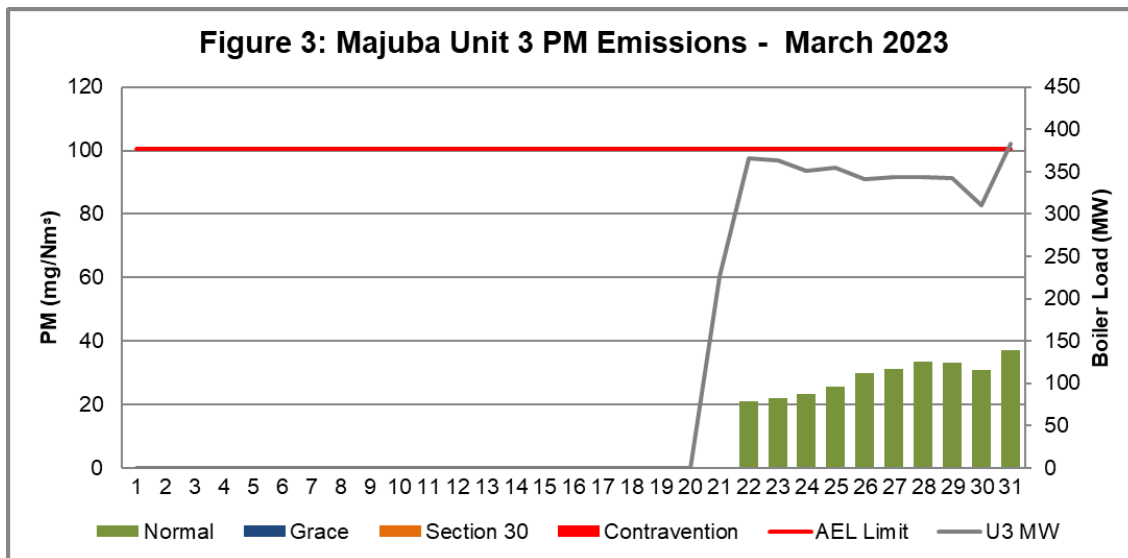
### Emissions Reporting



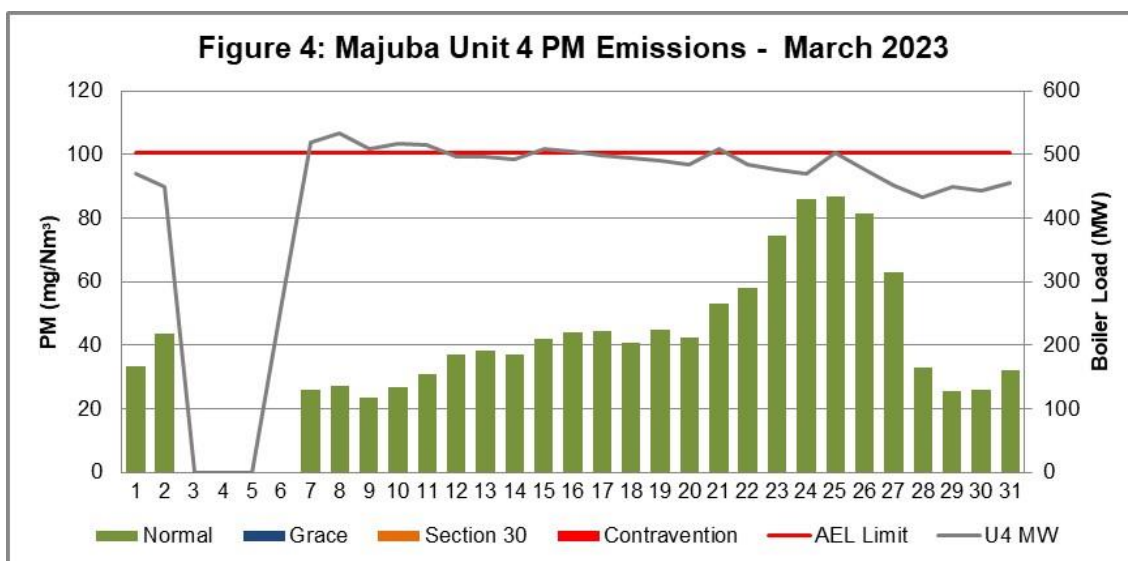
**Figure 1. Particulate Matter emissions (daily averages) for the month of March 2023 against emission limit for Unit 1.**



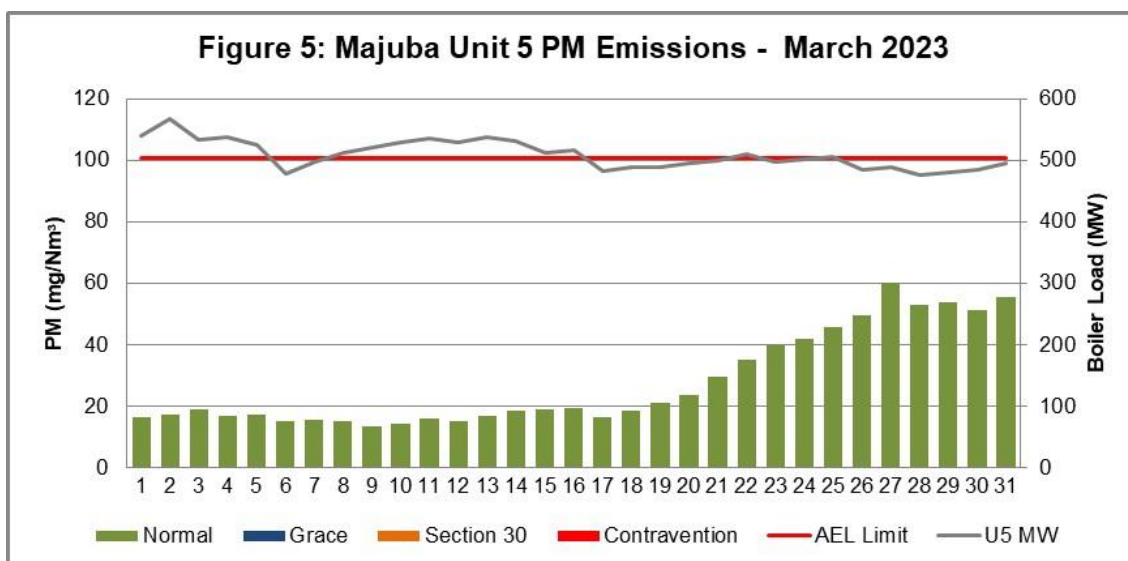
**Figure 2. Particulate Matter emissions (daily averages) for the month of March 2023 against emission limit for Unit 2.**



**Figure 3. Particulate Matter emissions (daily averages) for the month of March 2023 against emission limit for Unit 3.**



**Figure 4. Particulate Matter emissions (daily averages) for the month of March 2023 against emission limit for Unit 4.**



**Figure 5. Particulate Matter emissions (daily averages) for the month of March 2023 against emission limit for Unit 5.**

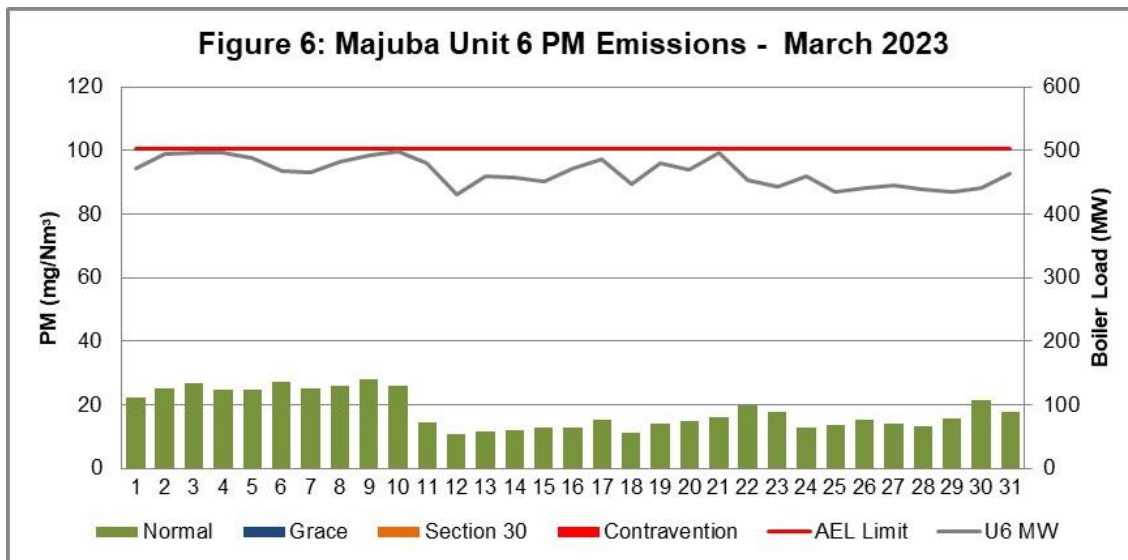


Figure 6. Particulate Matter emissions (daily averages) for the month of March 2023 against emission limit for Unit 6.

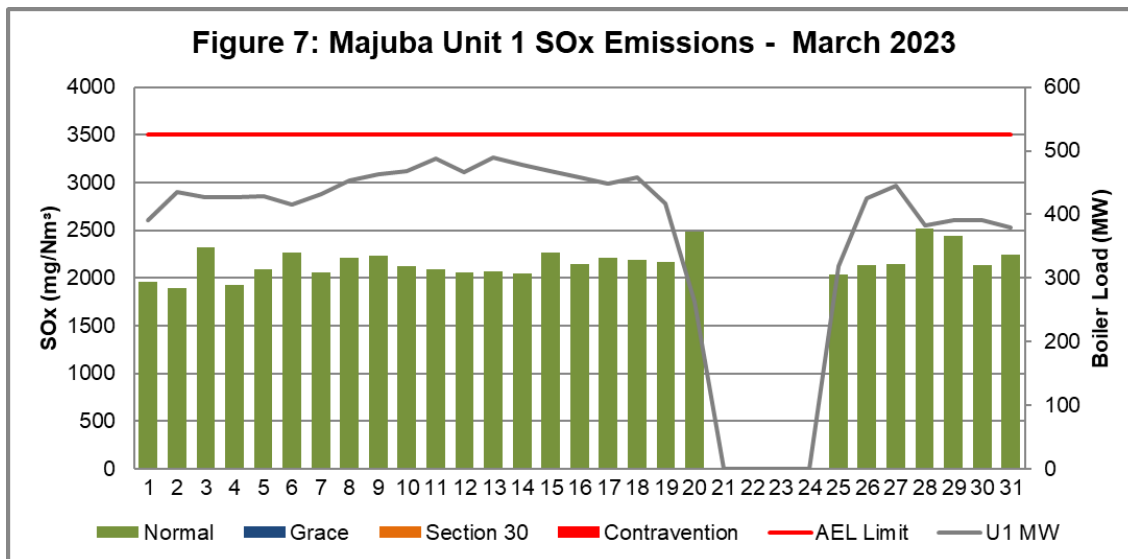


Figure 7. Sox emissions (daily averages) for the month of March 2023 against emission limit for Unit 1.

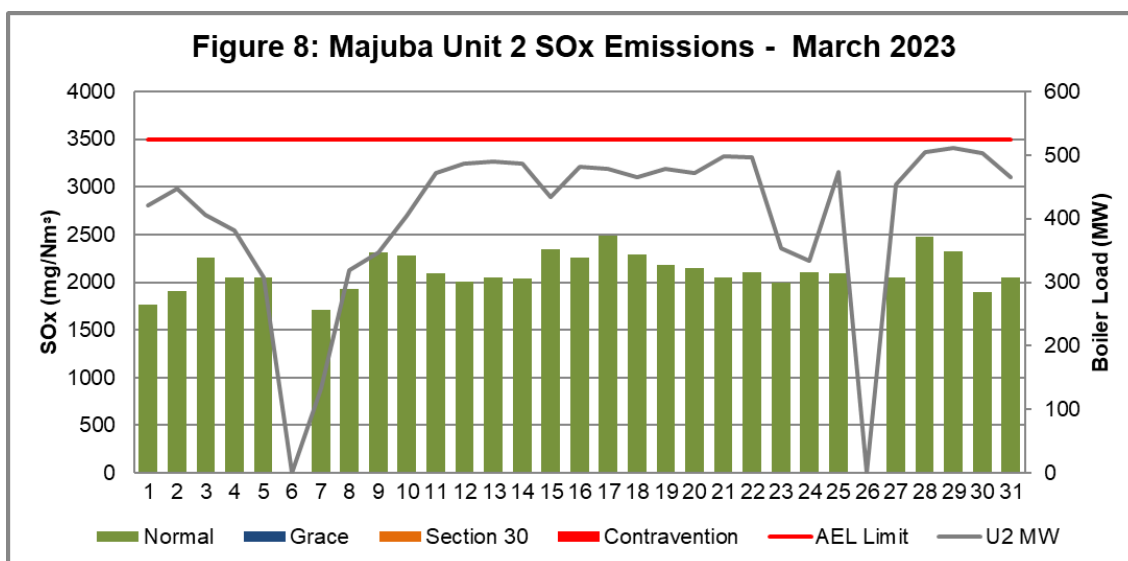


Figure 8. Sox emissions (daily averages) for the month of March 2023 against emission limit for Unit 2.

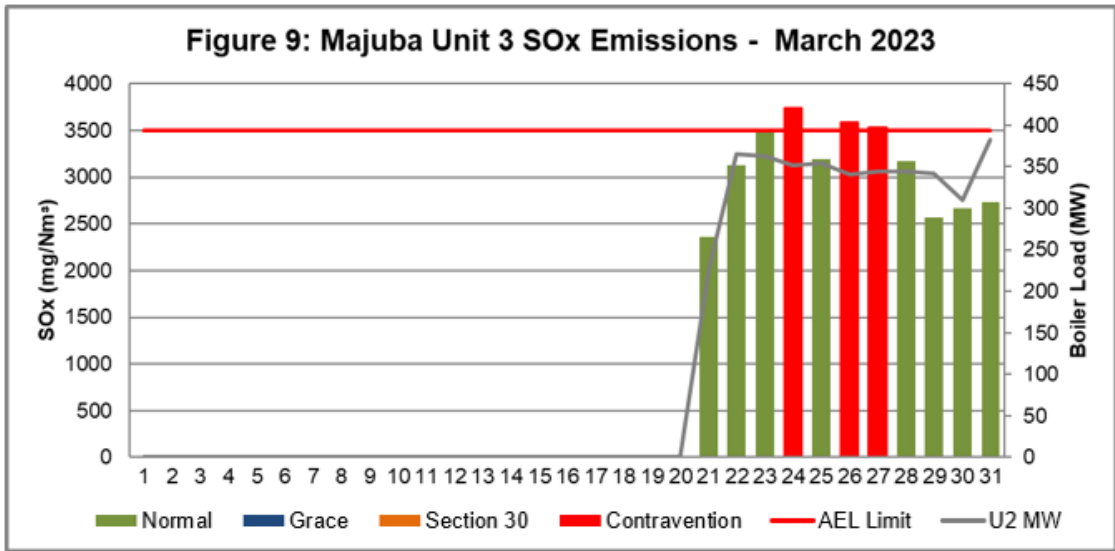


Figure 9. Sox emissions (daily averages) for the month of March 2023 against emission limit for Unit 3.

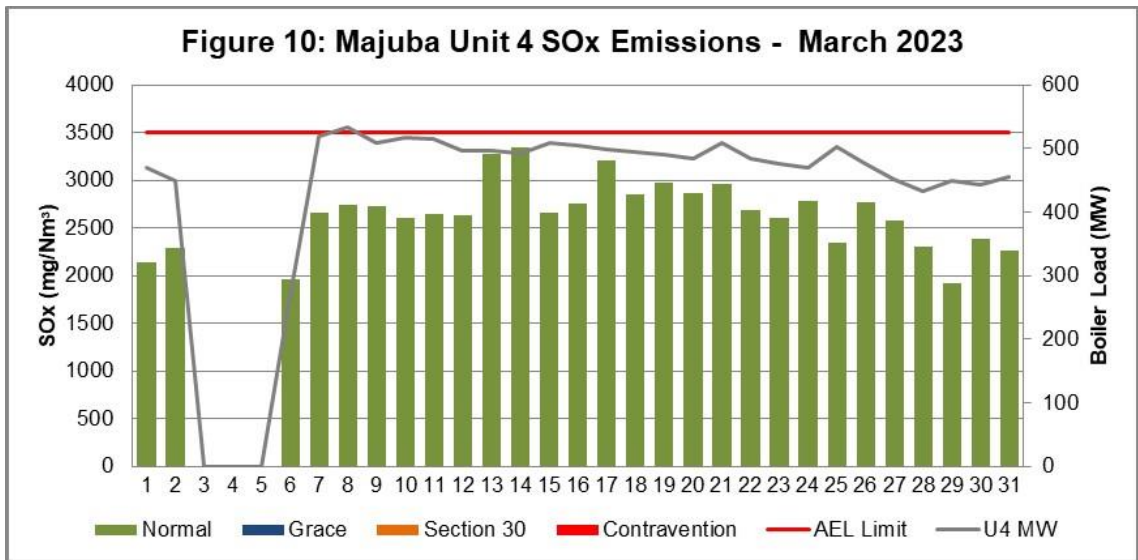


Figure 10. Sox emissions (daily averages) for the month of March 2023 against emission limit for Unit 4.

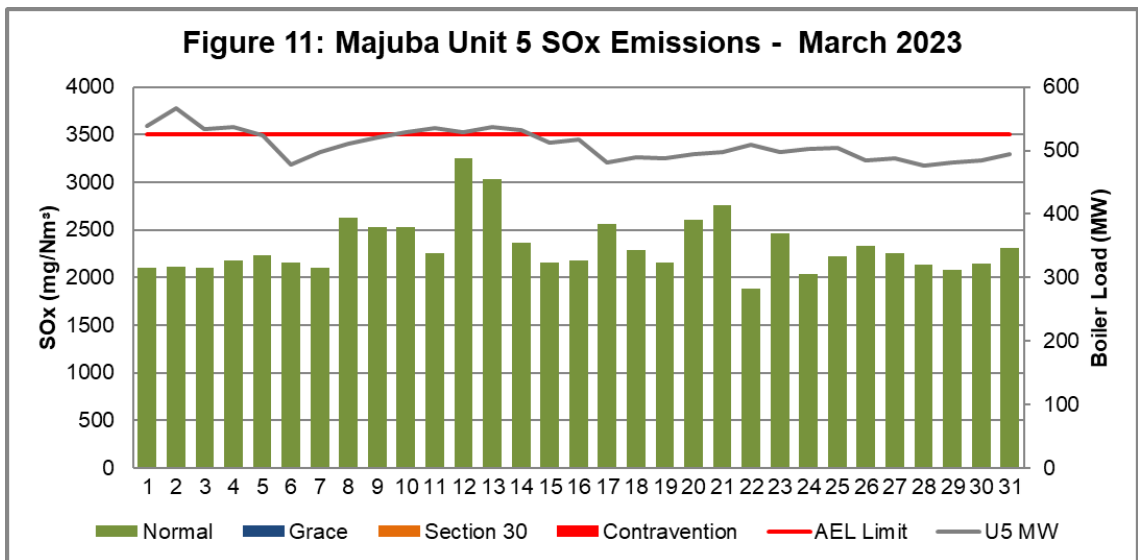


Figure 11. Sox emissions (daily averages) for the month of March 2023 against emission limit for Unit 5

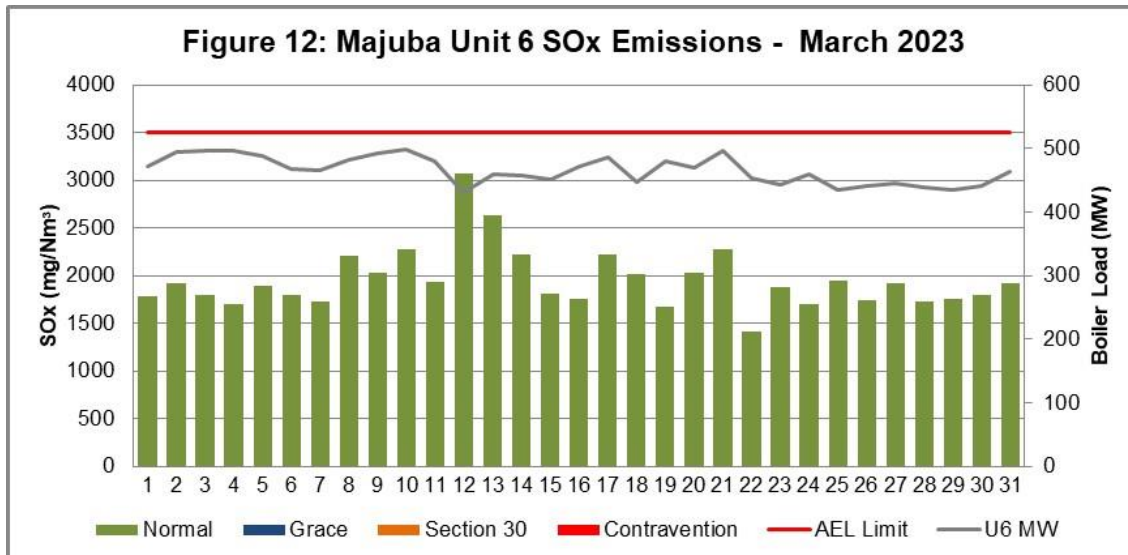


Figure 12. Sox emissions (daily averages) for the month of March 2023 against emission limit for Unit 6.

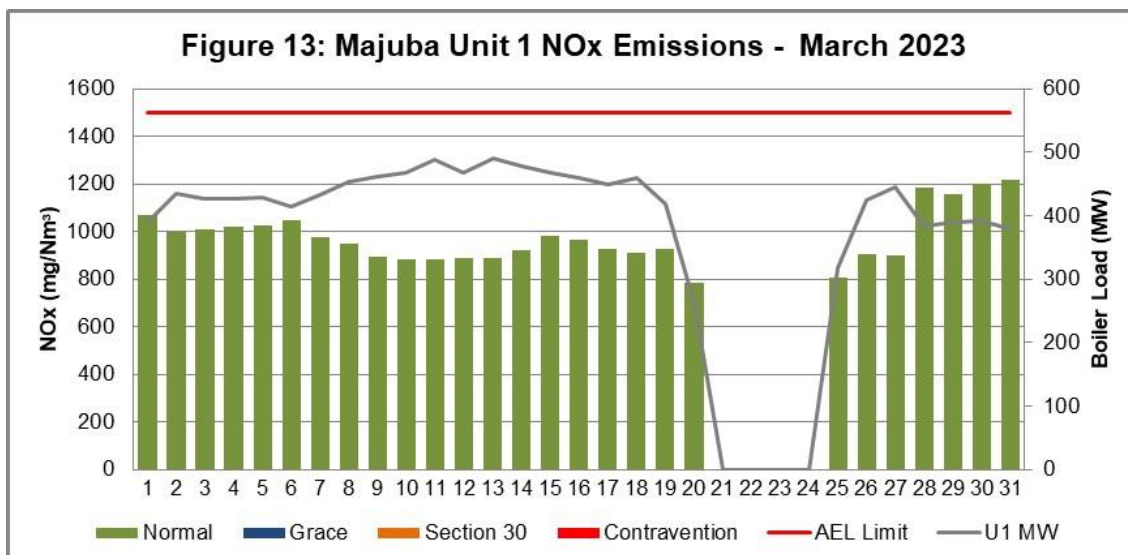


Figure 13. Nox emissions (daily averages) for the month of March 2023 against emission limit for Unit 1.

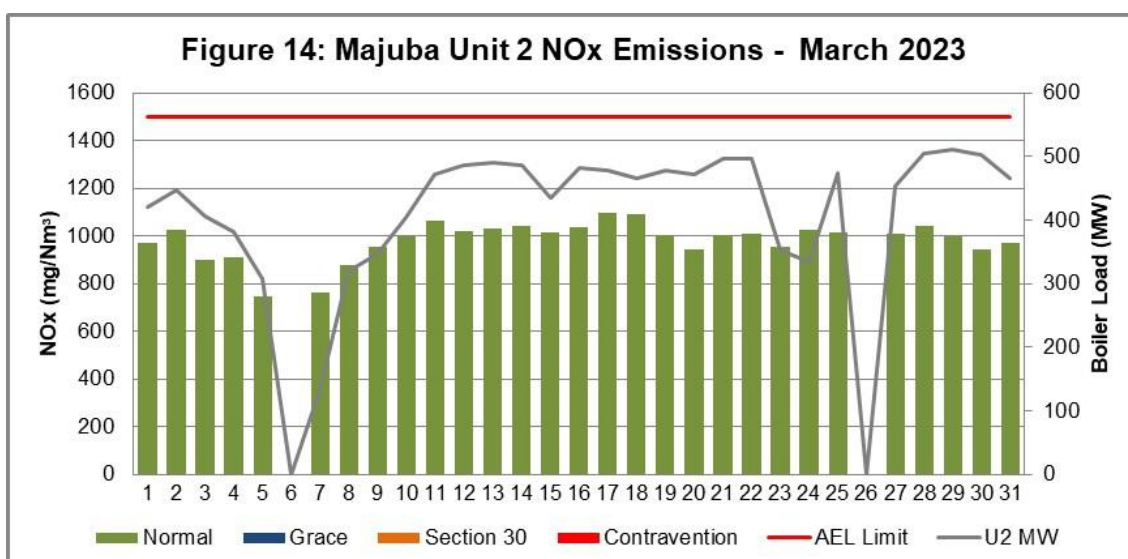


Figure 14. Nox emissions (daily averages) for the month of March 2023 against emission limit for Unit 2.

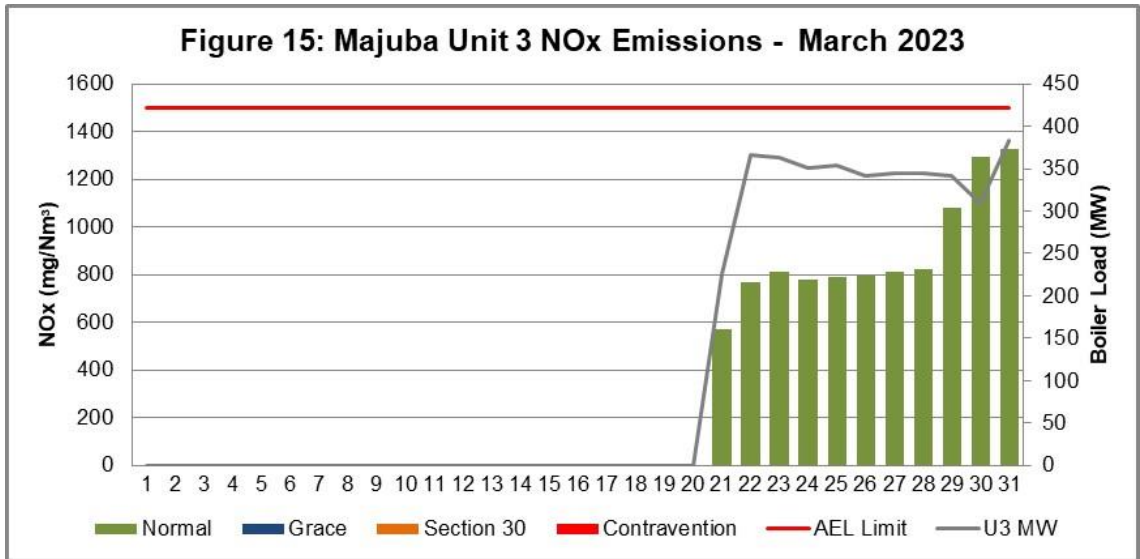


Figure 15. Nox emissions (daily averages) for the month of March 2023 against emission limit for Unit 3.

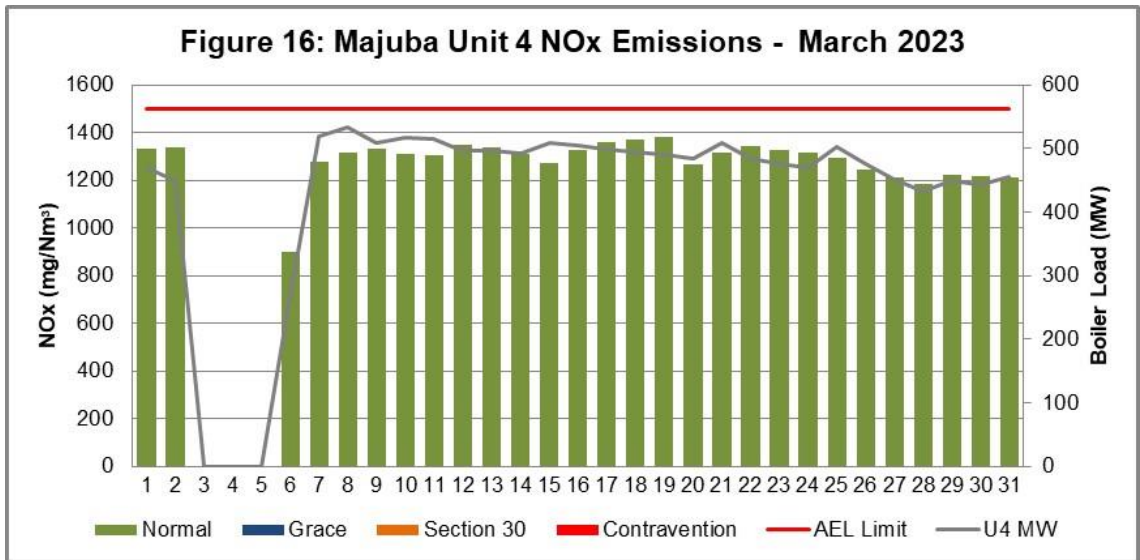


Figure 16. Nox emissions (daily averages) for the month of March 2023 against emission limit for Unit 4

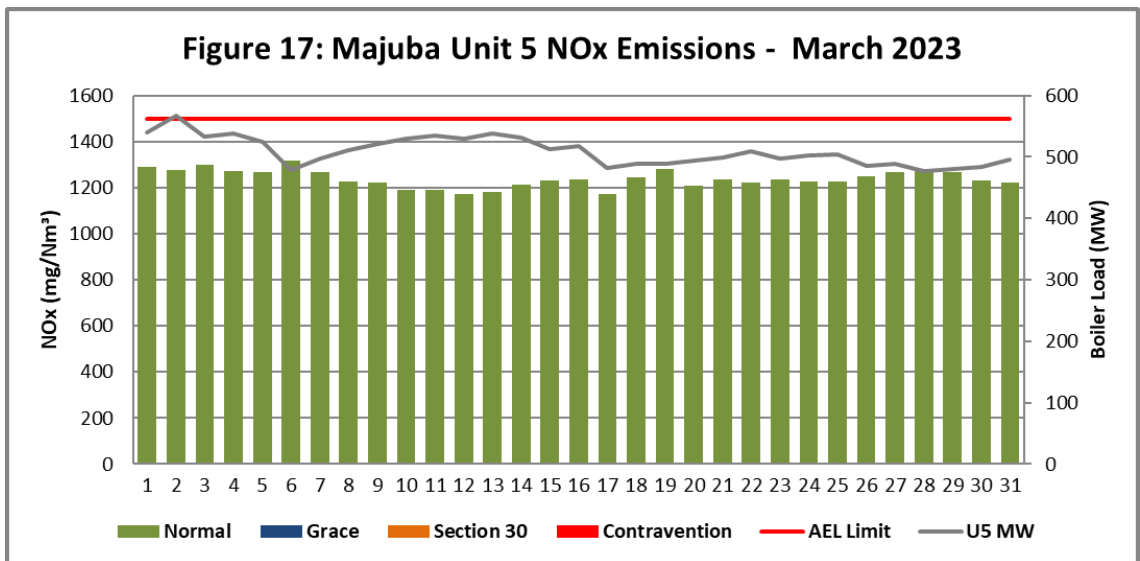


Figure 17. Nox emissions (daily averages) for the month of March 2023 against emission limit for Unit 5

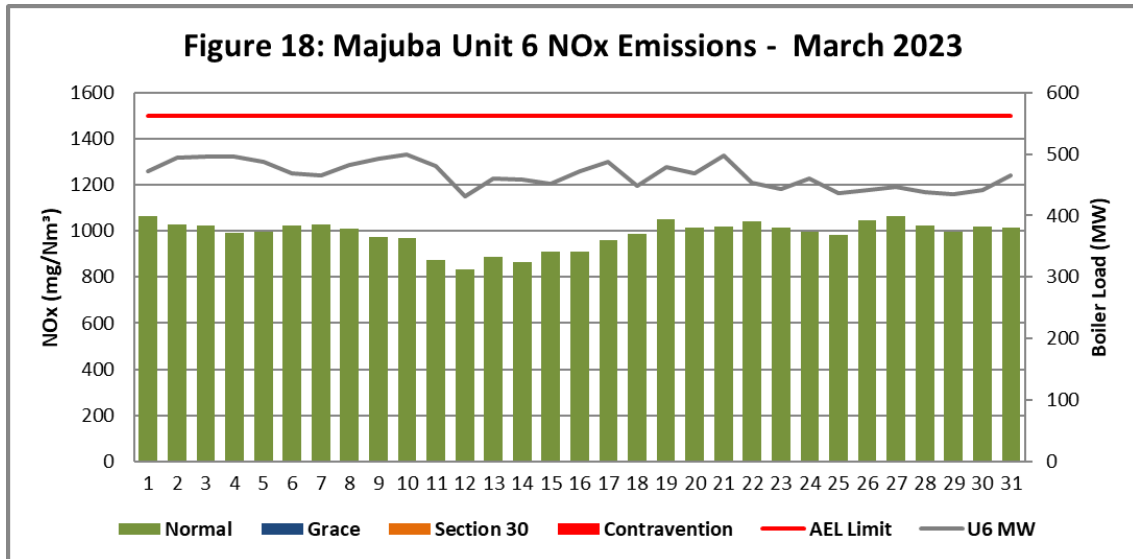


Figure 18. Nox emissions (daily averages) for the month March 2023 against emission limit for Unit 6

Table 4: Monthly tonnages for the month of March 2023

Unit	PM (tons)	SO <sub>2</sub> (tons)	NO <sub>x</sub> (tons)
Unit 1	42.1	3 328	1 514
Unit 2	43.8	3 021	1 417
Unit 3	10.7	1 303	376
Unit 4	69.2	4 274	2 072
Unit 5	58.1	5 123	2 725
Unit 6	37.0	3 945	1 994

Table 5: Average monthly concentrations (mg/Nm<sup>3</sup>) for the month of March 2023

Unit	PM (Mg/Nm <sup>3</sup> )	SO <sub>2</sub> (Mg/Nm <sup>3</sup> )	NO <sub>2</sub> (Mg/Nm <sup>3</sup> )
1	28.7	2 165.0	974.8
2	38.1	2 114.1	981.4
3	28.7	3 105.8	896.5
4	44.6	2 641.0	1 285.3
5	27.6	2 327.2	1 239.1
6	18.2	1 953.6	987.6

Table 6: Each unit and respective days operating in compliance to the AEL Emission Limits (SO<sub>x</sub>, NO<sub>x</sub>, and PM)

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance
Unit 1	26	0	0	0	0
Unit 2	25	0	0	0	0
Unit 3	8	0	0	3	3
Unit 4	27	0	0	0	0
Unit 5	31	0	0	0	0
Unit 6	31	0	0	0	0



**Table 7: MONITOR RELIABILITY (%)**

Associated Unit/Stack	PM	SO <sub>2</sub>	NO <sub>x</sub>	CO <sub>2</sub>
Unit 1	100.0	100.0	100.0	99.0
Unit 2	99.5	100.0	98.7	53.7
Unit 3	98.8	100.0	97.8	95.2
Unit 4	98.9	100.0	99.8	99.8
Unit 5	100.0	100.0	100.0	100.0
Unit 6	100.0	96.8	96.8	93.7

**CO<sub>2</sub> and O<sub>2</sub> Relationship**

Date	Final Average CO <sub>2</sub> (%)						Final Average O <sub>2</sub> (%)						Final Average CO <sub>2</sub> + O <sub>2</sub> (%)					
	U1	U2	U3	U4	U5	U6	U1	U2	U3	U4	U5	U6	U1	U2	U3	U4	U5	U6
01-Mar	8.0	8.2		9.4	10.3	9.9	11.2	11.8		11.8	10.1	9.8	19.3	20.0		21.2	20.4	19.7
02-Mar	8.8			9.2	10.8	10.3	10.4	12.3		12.3	9.6	9.3	19.2	12.3		21.5	20.4	19.6
03-Mar	8.4				10.4	10.1	10.9	13.1			10.2	9.4	19.3	13.1			20.6	19.5
04-Mar	8.6				10.6	10.3	10.7	13.3			10.0	9.3	19.2	13.3			20.6	19.6
05-Mar	8.7				10.5	10.1	10.6	13.8			10.1	9.4	19.3	13.8			20.6	19.6
06-Mar	8.5			7.6	9.8	9.9	10.8			11.9	11.0	9.7	19.3			19.4	20.8	19.6
07-Mar	8.7			9.9	9.3	9.8	10.6	12.9		11.2	10.6	9.9	19.3	12.9		21.1	19.9	19.7
08-Mar	9.0			10.2	9.4	9.9	10.3	12.2		11.1	10.3	9.7	19.3	12.2		21.3	19.7	19.6
09-Mar	9.1			10.1	9.4	9.9	10.1	12.7		11.5	10.1	9.6	19.3	12.7		21.6	19.5	19.6
10-Mar	9.1			10.1	9.4	10.0	10.2	12.3		11.3	9.6	9.6	19.3	12.3		21.3	19.0	19.6
11-Mar	9.4			10.3	9.4	9.8	9.9	11.1		11.1	9.2	9.7	19.2	11.1		21.4	18.6	19.5
12-Mar	9.1			9.9	9.3	8.5	10.2	11.0		11.6	9.9	11.2	19.3	11.0		21.5	19.2	19.7
13-Mar	9.2			9.7	9.3	8.9	10.0	11.0		11.8	9.8	10.5	19.2	11.0		21.6	19.1	19.4
14-Mar	9.0			9.6	9.3	8.6	10.3	11.1		11.7	9.7	10.5	19.3	11.1		21.3	19.1	19.0
15-Mar	9.0	14.6		10.1	9.7	8.6	10.4	12.0		11.1	9.9	10.5	19.4	26.6		21.2	19.7	19.2
16-Mar	8.9	14.6		9.9	10.7	8.7	10.5	11.4		11.4	9.7	10.3	19.4	26.0		21.3	20.4	19.0
17-Mar	8.3	14.2		9.6	9.9	8.7	11.1	11.9		11.9	10.8	10.1	19.4	26.1		21.5	20.7	18.8
18-Mar	8.5	14.1		9.8	10.3	8.7	10.9	11.8		11.7	10.2	10.3	19.4	25.9		21.4	20.5	19.0
19-Mar	8.1	14.6		9.8	10.2	8.8	11.3	11.3		11.6	10.4	9.5	19.4	25.9		21.4	20.6	18.3
20-Mar	7.3	14.7		9.8	10.5	8.7	12.7	11.3		11.5	10.0	9.7	20.0	25.9		21.3	20.5	18.4
21-Mar		14.7	7.2	9.8	10.3	8.7		11.1	13.4	11.6	10.2	9.7		25.8	20.6	21.4	20.5	18.3
22-Mar		14.5	8.4	9.2	10.5	8.7		11.3	12.4	12.3	9.9	10.4		25.8	20.8	21.6	20.5	19.1
23-Mar		12.7	8.6	9.5	10.3	8.6		12.1	12.5	11.8	10.3	10.4		24.8	21.1	21.3	20.6	18.9
24-Mar		12.6	8.3	9.5	10.7	8.6		12.3	12.9	11.8	9.7	10.0		24.9	21.2	21.3	20.5	18.6
25-Mar	7.7	14.9	8.7	10.1	10.9	8.5	12.0	11.1	12.4	11.2	9.7	10.3	19.7	26.0	21.2	21.3	20.6	18.8
26-Mar	8.5		8.5	9.4	10.5	8.7	11.1		12.9	12.0	10.2	10.4	19.6		21.3	21.4	20.7	19.1
27-Mar	8.7	13.9	8.5	8.9	10.6	8.5	10.9	11.1	12.7	12.5	9.8	10.7	19.6	25.0	21.3	21.4	20.4	19.2
28-Mar	7.4	14.4	8.4	8.9	10.2		12.6	11.6	12.8	12.6	10.1	10.8	20.1	26.0	21.2	21.4	20.3	10.8
29-Mar	7.6	11.1	8.4	9.1	10.2	9.2	12.3	11.1	12.7	12.2	10.0	10.6	19.9	22.2	21.1	21.4	20.2	19.7
30-Mar	7.8	9.5	7.7	9.0	10.5	9.1	12.4	10.6	13.5	12.4	9.9	10.4	20.1	20.0	21.2	21.4	20.4	19.5
31-Mar	7.5	9.1	8.5	9.2	11.0	8.9	12.7	11.4	12.5	12.1	9.4	9.7	20.2	20.5	21.1	21.3	20.3	18.6
<b>Totals</b>	<b>8.5</b>	<b>13.1</b>	<b>8.3</b>	<b>9.6</b>	<b>10.1</b>	<b>9.2</b>	<b>11.0</b>	<b>11.8</b>	<b>12.8</b>	<b>11.7</b>	<b>10.0</b>	<b>10.1</b>	<b>19.5</b>	<b>24.9</b>	<b>21.1</b>	<b>21.3</b>	<b>20.2</b>	<b>19.2</b>

Calculation: CO<sub>2</sub>% + O<sub>2</sub>% = 19.5-21.5%

**Table 8: CO<sub>2</sub> and O<sub>2</sub> deviations of the Month of March 2023**

\*Blank spaces indicate that the unit was offline during that period

## Emergency Generation

**Table 9: Emergency Generation for the month of March 2023**

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Emergency Generation hours declared by national Control	0	0	0	0	0	0
Emergency Hours declared including hours after stand down	0	0	0	0	0	0
Hours over the Limit during Emergency Generation	0	0	0	0	0	0

### Comments on the performance and availability of each unit

#### UNIT 1

The unit base loaded for most of the days during the month and off for four days. Sixty-four fabric filter bags were replaced during the month.

#### UNIT 2

T The unit base loaded for most of the days during the month and off for two days. Twenty-one fabric filter bags were replaced during the month.

#### UNIT 3

The unit was on extended outage which was twenty days of the month. Twenty-four fabric filter bags were replaced during the month.

#### UNIT 4

The unit base loaded for most of the days during the month and off for three days. Forty-three fabric filter bags were replaced during the month.

#### UNIT 5

The unit base loaded for all of the days during the month. Fifty-two fabric filter bags were replaced during the month.

#### UNIT 6

The unit base loaded for all of the days during the month. Thirty-two fabric filter bags were replaced during the month.

### Complaints Register

**Table 10: Complaints for the month of March 2023**

Source Code/ Name	Root Cause Analysis	Calculation of Impacts/ emissions associated with the incident	Dispersion modelling of pollutants where applicable	Measures implemented to prevent reoccurrence	Date by which measure will be implemented
	No complaints were received during the month of March 2023.				

## General

Fuel oil consumption for the month of March 2023 exceeded the AEL limit of 6000 tons and the station is currently implementing an action plan to address the high fuel oil consumption associated with mills capability support. In addition, the ash content for the month of March 2023 exceeded the AEL limit of 30%, and the station will be investigating the cause. Sulphur dioxide (SO<sub>2</sub>) emissions at Unit 3 exceeded the AEL limit of 3500 mg/Nm<sup>3</sup> on the 24<sup>th</sup>, 26<sup>th</sup> and 27<sup>th</sup> of March 2023. The station will investigate the cause of the exceedances.

Yours sincerely

Report compiled by:



Faith Kagoda  
**ENVIRONMENTAL MANAGER: (MAJUBA)**

Date 11/04/2023

Report verified by:



Lindani Madonsela  
**BOILER ENGINEERING MANAGER: (MAJUBA)**

Date 11/04/2023

Report approved by:



Johan Swanepoel  
**ENGINEERING MANAGER: (MAJUBA)**

2023/04/12

Date