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Date: 11 April 2022

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Dear Mr. Hlanyane

## MAJUBA POWER STATION'S MONTHLY EMISSIONS REPORT FOR THE MONTH OF MARCH 2022

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 2022. 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 2022**

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption/ Rate in Month of March 2022
	Coal	Tons/month	1 800 000	1 055 317.36
	Fuel Oil	Tons/month	6 000	11 465.1
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity - MW)	Production Rate in Month of March 2022
	Energy	GWh	4 110	1 909.49
	Ash	Tons/month	Not stated in the license	279 659.10

### Abatement Technology

**Table 2. Abatement Equipment Control Technology for the month of March 2022**

Associated Unit	Technology Type	Actual Utilisation (%) for the month of March 2022	*Minimum Control Efficiency (%)
Unit 1	Fabric Filter Plant	100	99.98%
Unit 2	Fabric Filter Plant	100	99.97%
Unit 3	Fabric Filter Plant	100	99.93%
Unit 4	Fabric Filter Plant	100	99.93%
Unit 5	Fabric Filter Plant	100	99.93%
Unit 6	Fabric Filter Plant	100	99.98%

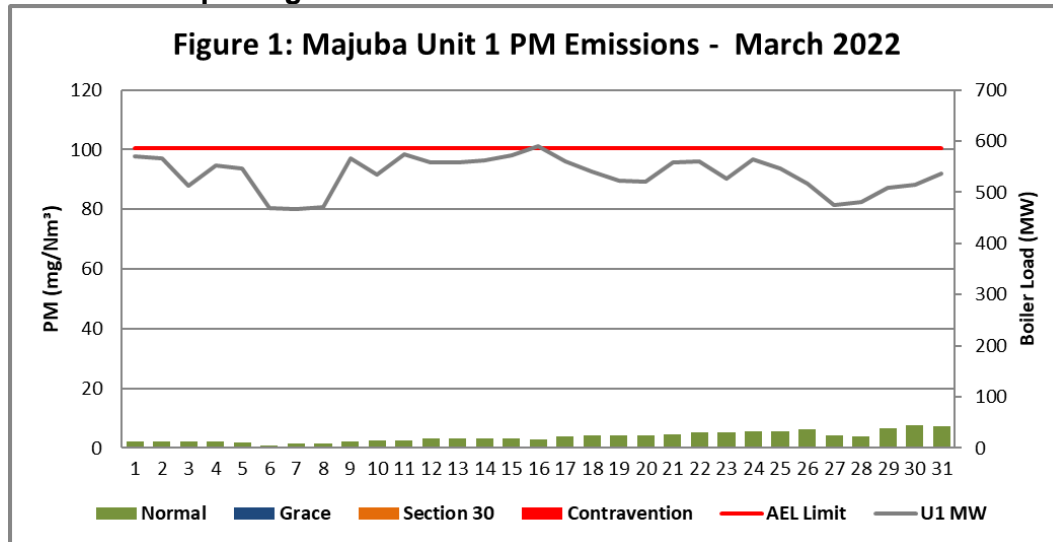
\*Calculated from the assumption of 90% fly ash to 10% bottom ash and percentage ash as measured in coal.

## Energy Source Characteristics

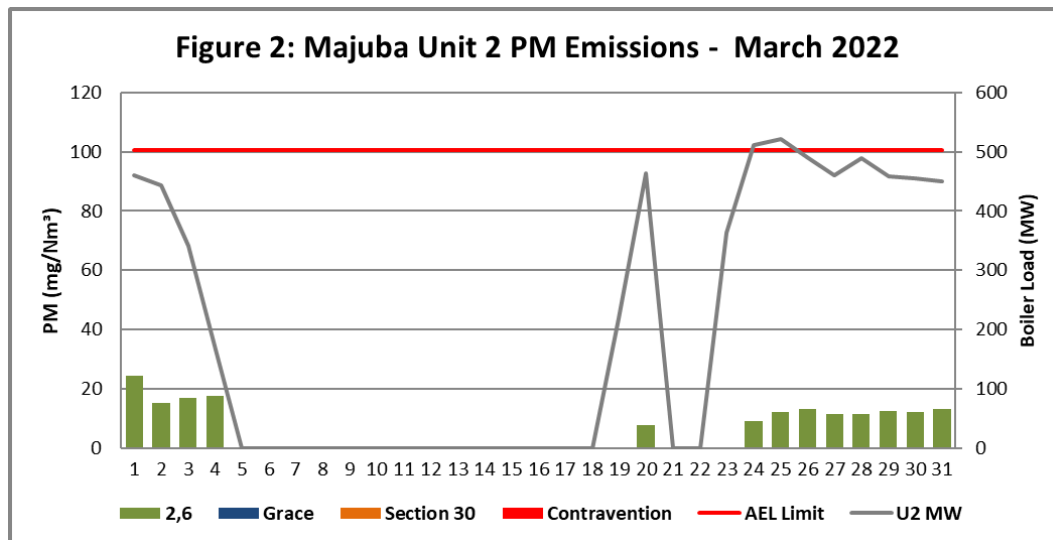
**Table 3. Energy Source Material Characteristics for the month of March 2022**

Characteristic	Stipulated Range (Unit)	Monthly Average Content
Sulphur Content	0.6 to >0.94%	1.0%
Ash Content	28 to >30%	26.5%

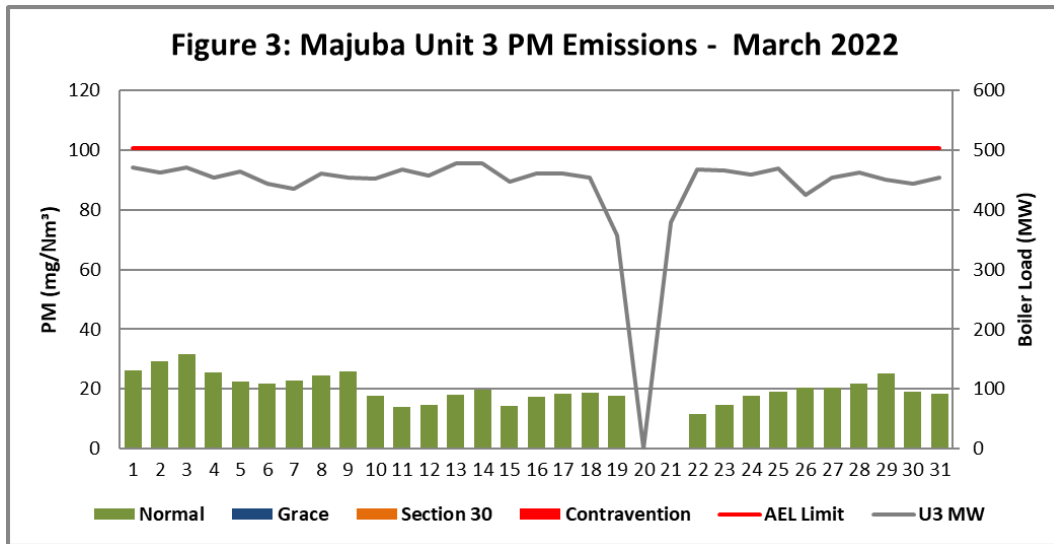
## Emissions Reporting



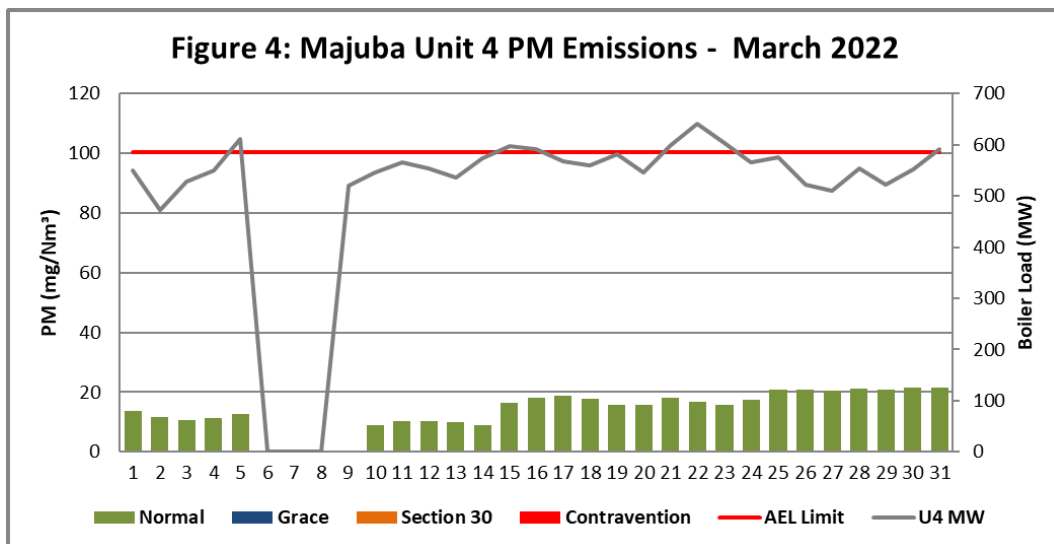
**Figure 1. Particulate Matter emissions (daily averages) for the month of March 2022 against emission limit for Unit 1.**



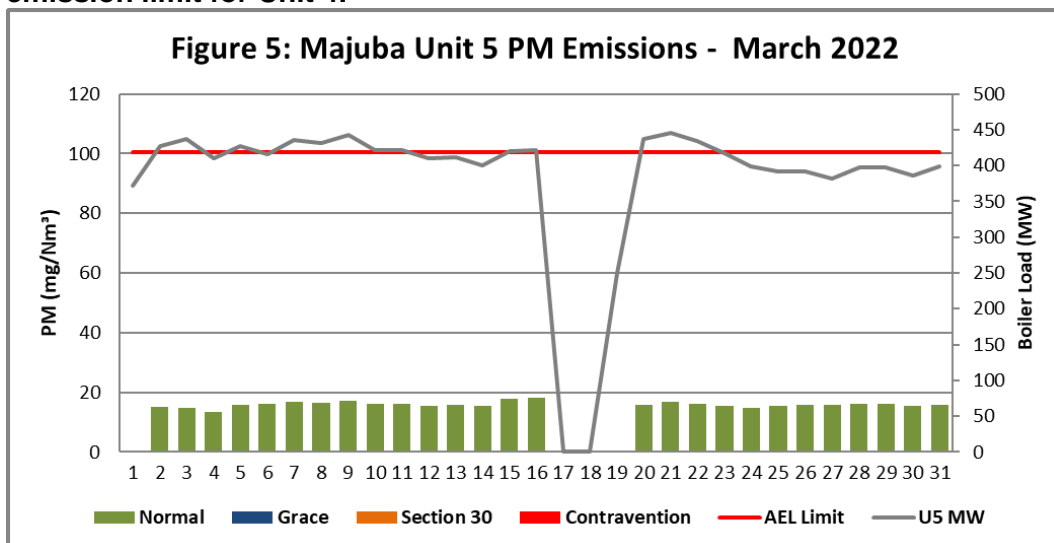
**Figure 2. Particulate Matter emissions (daily averages) for the month of March 2022 against emission limit for Unit 2.**



**Figure 3. Particulate Matter emissions (daily averages) for the month of March 2022 against emission limit for Unit 3.**



**Figure 4. Particulate Matter emissions (daily averages) for the month of March 2022 against emission limit for Unit 4.**



**Figure 5. Particulate Matter emissions (daily averages) for the month of March 2022 against emission limit for Unit 5.**

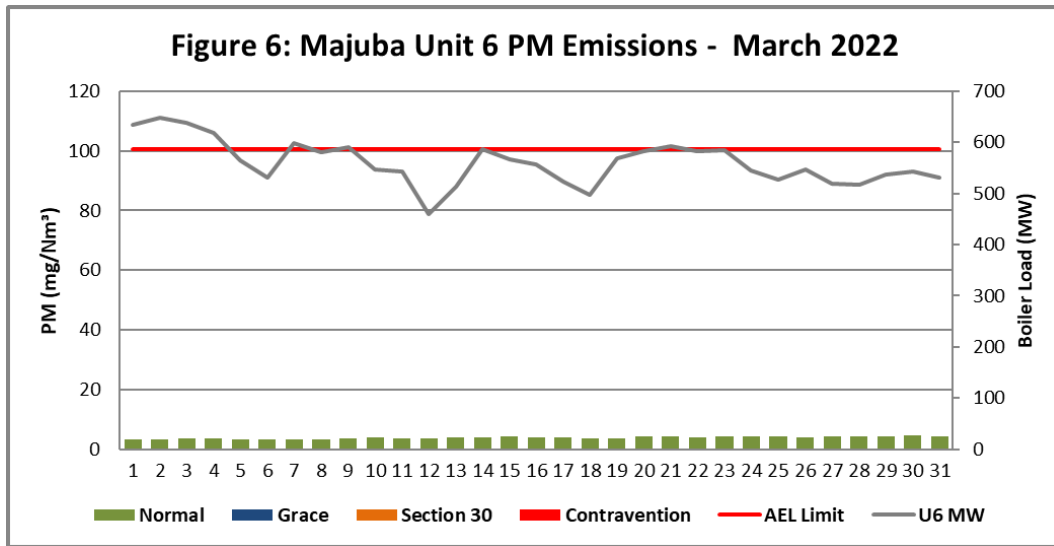


Figure 6. Particulate Matter emissions (daily averages) for the month of March 2022 against emission limit for Unit 6.

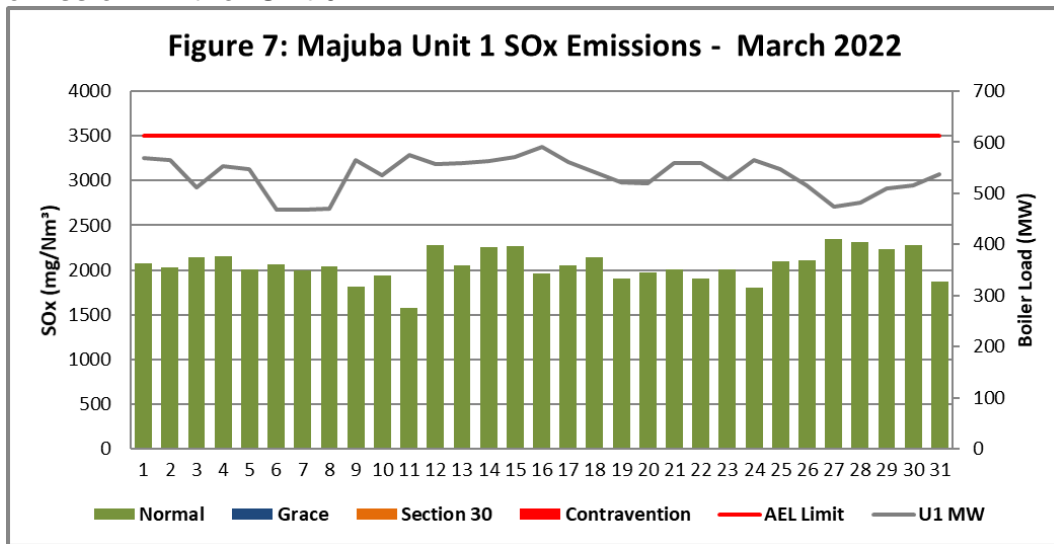


Figure 7. SOx emissions (daily averages) for the month of March 2022 against emission limit for Unit 1.

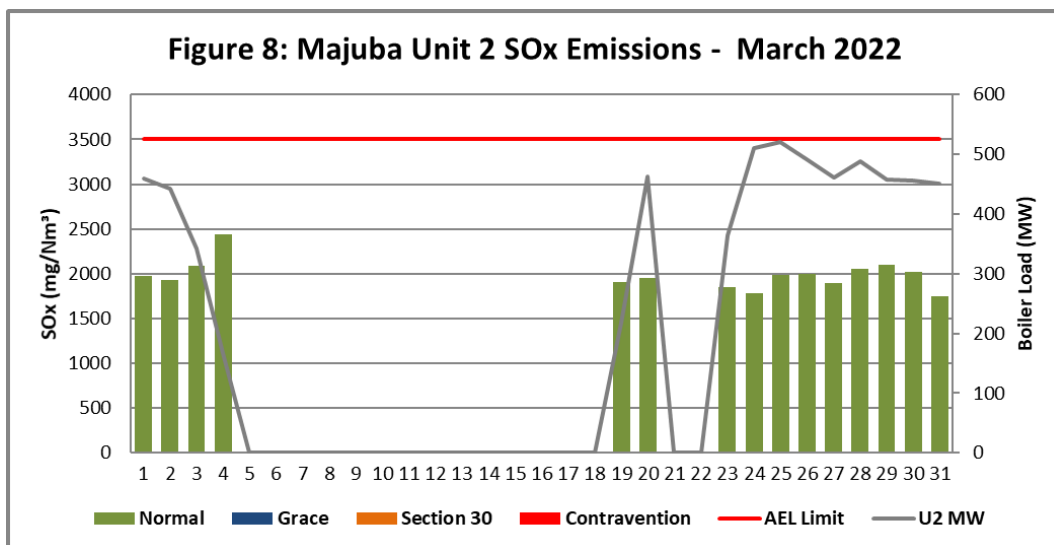


Figure 8. SOx emissions (daily averages) for the month of March 2022 against emission limit for Unit 2.

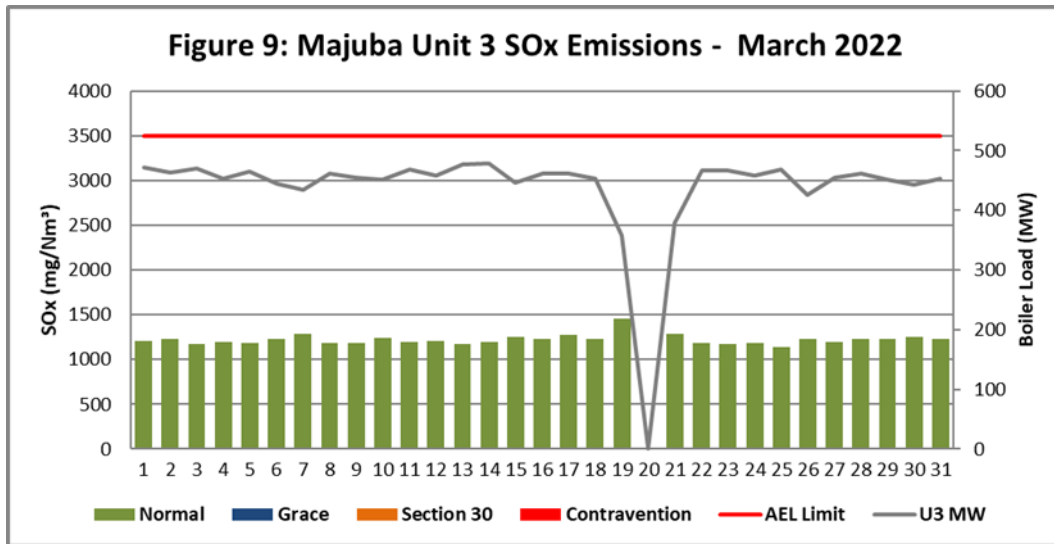


Figure 9. SOx emissions (daily averages) for the month of March 2022 against emission limit for Unit 3.

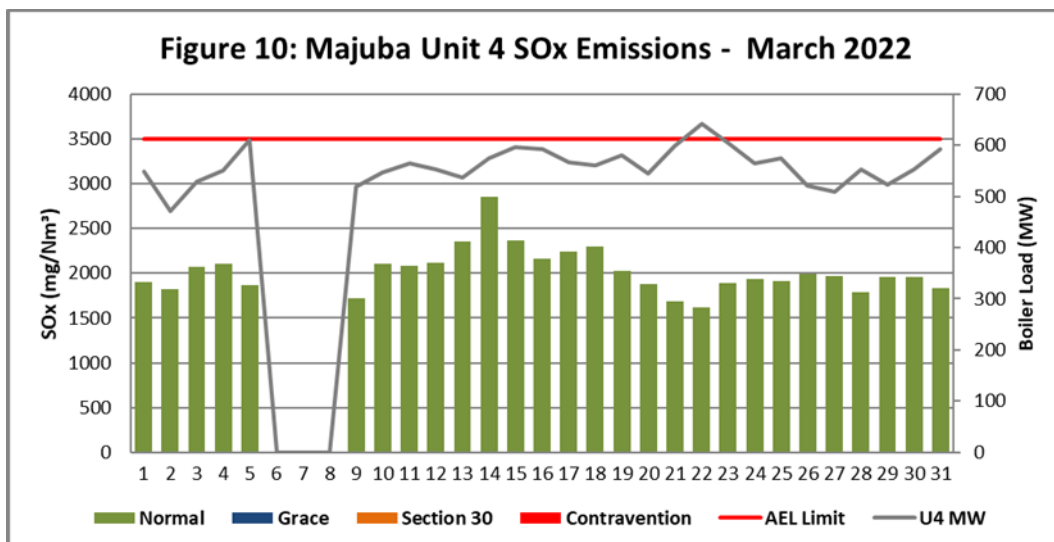


Figure 10. SOx emissions (daily averages) for the month of March 2022 against emission limit for Unit 4.

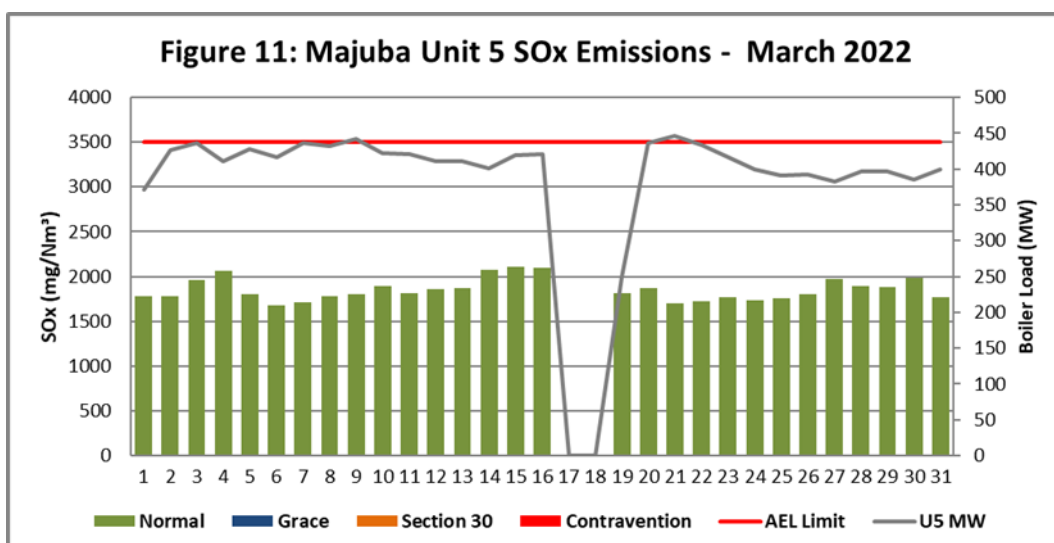


Figure 11. SOx emissions (daily averages) for the month of March 2022 against emission limit for Unit 5.

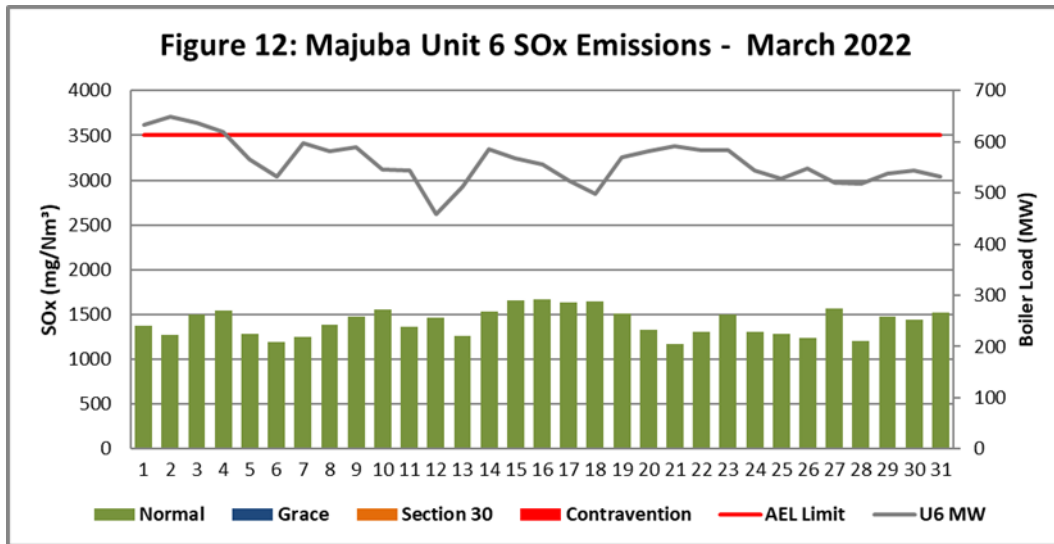


Figure 12. SOx emissions (daily averages) for the month of March 2022 against emission limit for Unit 6.

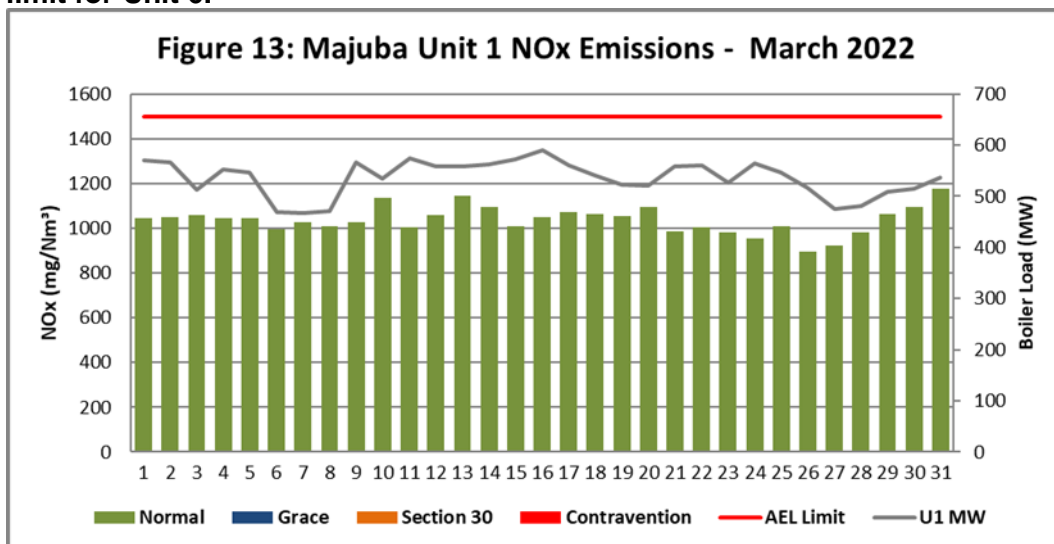


Figure 13. NOx emissions (daily averages) for the month of March 2022 against emission limit for Unit 1.

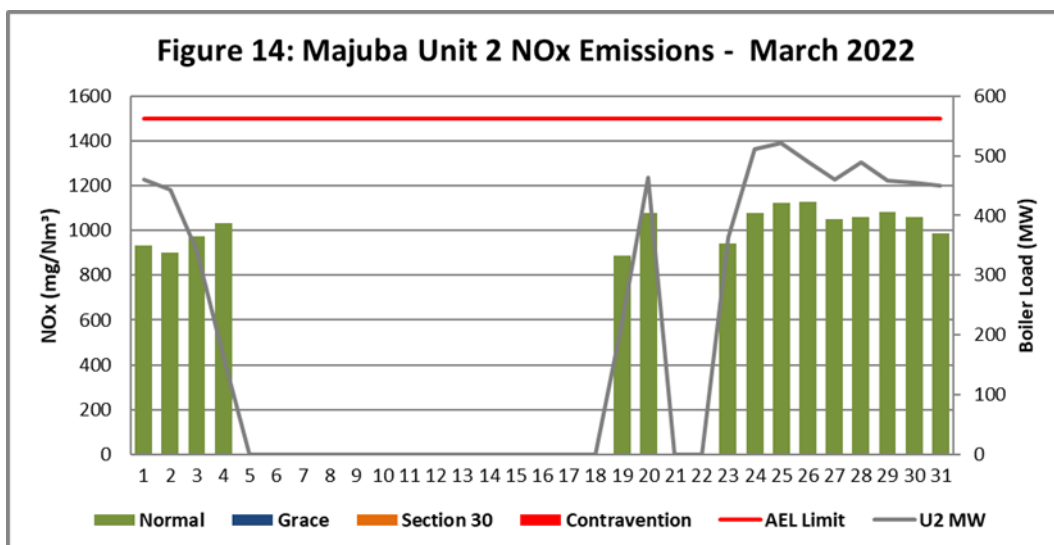


Figure 14. NOx emissions (daily averages) for the month of March 2022 against emission limit for Unit 2.

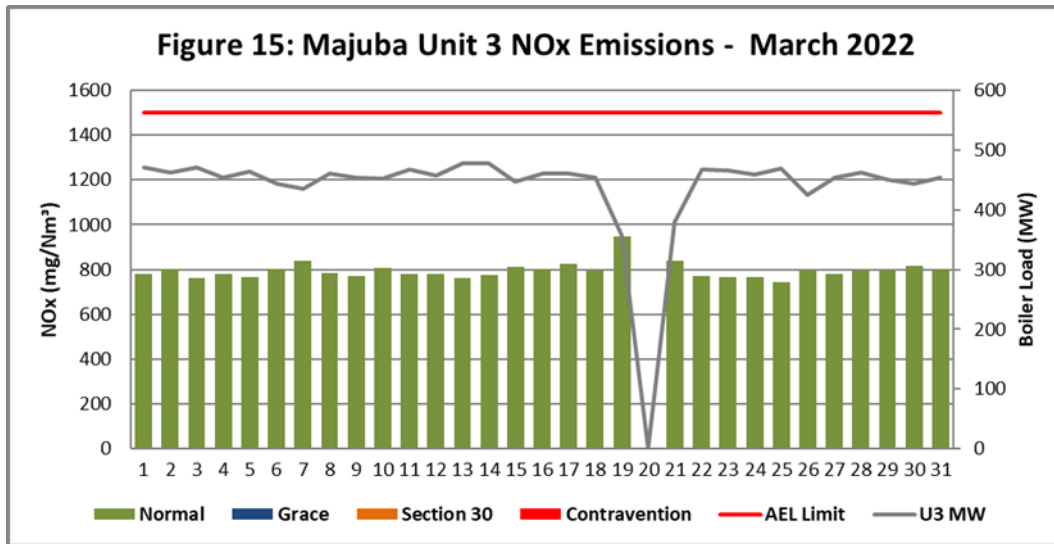


Figure 15. NOx emissions (daily averages) for the month of March 2022 against emission limit for Unit 3.

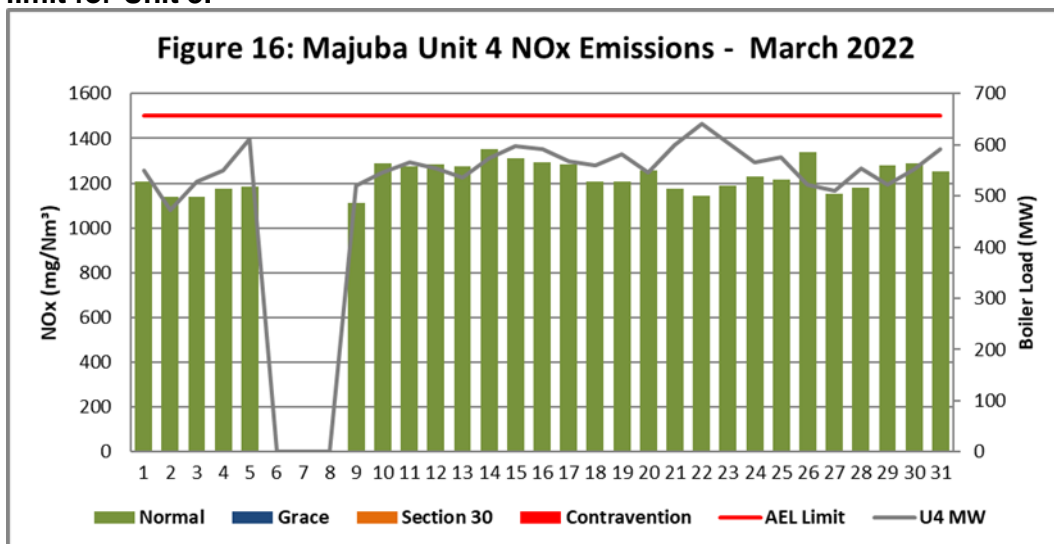


Figure 16. NOx emissions (daily averages) for the month of March 2022 against emission limit for Unit 4

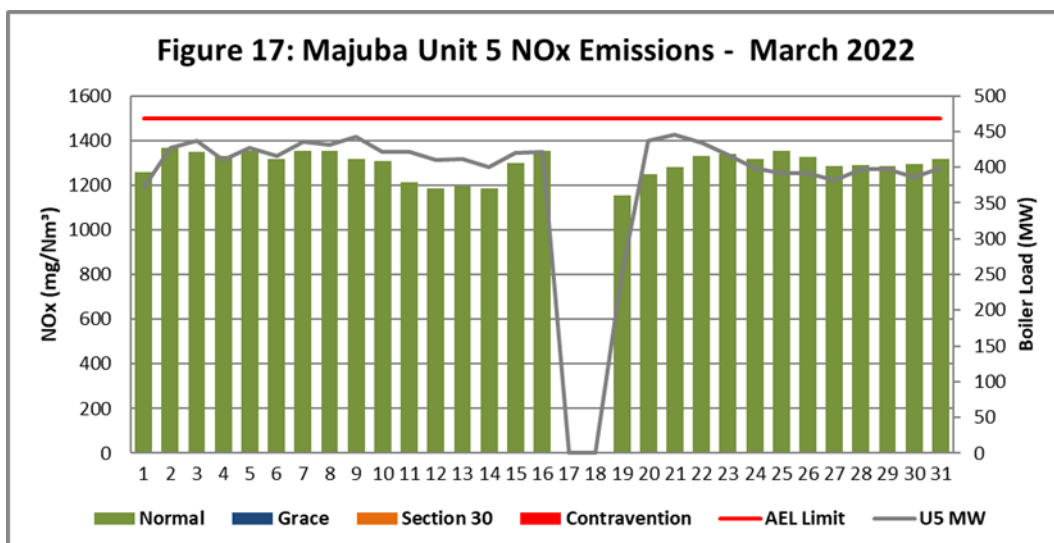


Figure 17. NOx emissions (daily averages) for the month of March 2022 against emission limit for Unit 5

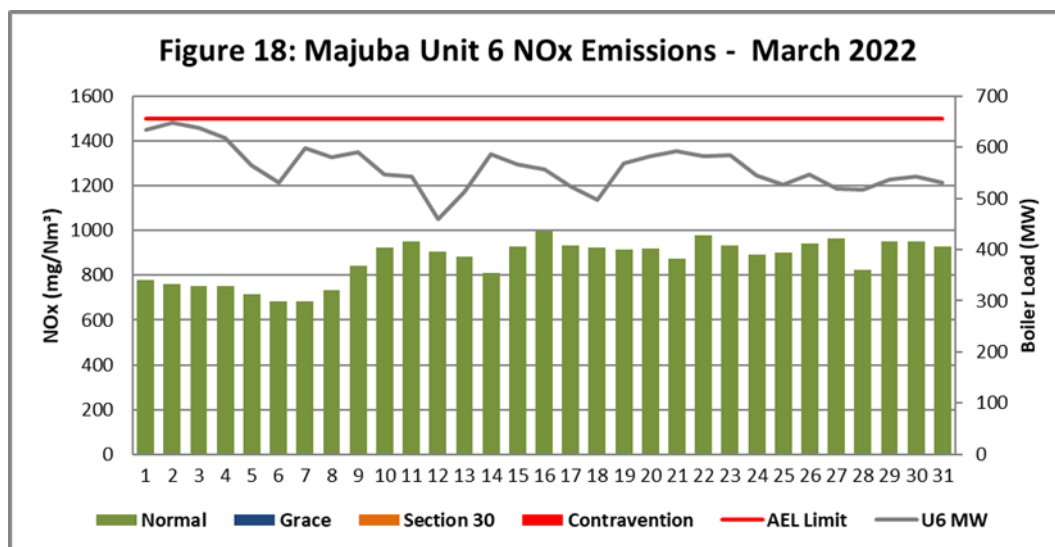


Figure 18. NOx emissions (daily averages) for the month March 2022 against emission limit for Unit 6

Table 4: Monthly tonnages for the month of March 2022

Unit	PM (tons)	SO <sub>2</sub> (tons)	NO <sub>x</sub> (tons)
1	8,0	4 366	2 211
2	6,4	1 296	687
3	33,1	2 034	1 322
4	30,8	4 069	2 480
5	27,0	3 403	2 387
6	8,8	3 376	2 065
<b>Sum</b>	<b>114,1</b>	<b>18 544</b>	<b>11 152</b>

Table 5: Average monthly concentrations (mg/Nm<sup>3</sup>) for the month of March 2022

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	3,7	2 053,5	1 037,0
2	13,6	1 981,4	1 020,8
3	20,3	1 222,5	794,8
4	15,8	2 018,5	1 230,2
5	16,0	1 853,4	1 295,4
6	3,9	1 416,4	868,3

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	31	0	0	0	0
Unit 2	15	0	0	0	0
Unit 3	30	0	0	0	0
Unit 4	28	0	0	0	0
Unit 5	29	0	0	0	0
Unit 6	31	0	0	0	0



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

Associated Unit/Stack	PM	SO <sub>2</sub>	NO	CO <sub>2</sub>
Unit 1	100,0	100,0	100,0	100,0
Unit 2	100,0	100,0	100,0	94,8
Unit 3	100,0	100,0	100,0	99,7
Unit 4	100,0	100,0	100,0	100,0
Unit 5	100,0	100,0	100,0	99,0
Unit 6	100,0	97,4	100,0	100,0

**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	10,6	9,2	10,4	11,6	9,8	12,0	10,0	11,3	10,2	9,1	10,8	7,4	20,7	20,5	20,6	20,7	20,7	19,4
02-Mar	10,6	9,0	10,3	10,6	9,8	12,2	10,0	11,5	10,4	10,1	11,1	7,2	20,6	20,5	20,7	20,7	20,9	19,4
03-Mar	9,8	8,1	10,5	11,4	9,8	12,0	11,0	12,9	9,9	9,3	11,2	7,3	20,8	21,0	20,4	20,7	21,0	19,3
04-Mar	10,6	7,8	10,3	11,6	9,9	11,7	9,9	13,5	10,1	9,1	11,1	7,7	20,6	21,3	20,4	20,7	20,9	19,4
05-Mar	10,5		10,5	12,5	10,0	11,3	9,8		10,0	8,2	11,0	8,3	20,3		20,4	20,7	20,9	19,6
06-Mar	9,5		10,1		10,1	10,8	11,0		10,4		10,8	8,8	20,5		20,5		20,9	19,6
07-Mar	9,2		9,8		10,0	11,6	11,0		10,9		10,9	7,8	20,2		20,7		20,9	19,4
08-Mar	8,9		10,4		10,1	11,4	10,9		10,0		10,9	8,2	19,9		20,4		20,9	19,6
09-Mar	9,2		10,3	11,0	10,3	11,2	9,6		10,0	9,0	10,6	8,4	18,8		20,3	20,1	20,9	19,6
10-Mar	9,2		9,9	11,2	10,1	10,4	10,7		10,5	9,7	10,7	9,4	19,8		20,4	20,9	20,8	19,7
11-Mar	9,1		10,2	11,6	10,0	10,3	9,6		10,1	9,2	11,0	9,4	18,7		20,3	20,8	20,9	19,7
12-Mar	9,2		10,2	11,5	10,0	10,0	10,1		10,1	9,5	11,0	9,8	19,3		20,3	21,0	21,1	19,7
13-Mar	9,2		10,5	11,4	9,9	10,6	10,3		9,9	9,6	11,1	8,9	19,5		20,4	20,9	21,0	19,6
14-Mar	9,3		10,3	11,9	9,8	11,4	10,0		10,0	8,9	11,3	8,1	19,3		20,3	20,9	21,0	19,5
15-Mar	9,1		10,1	12,0	9,9	10,7	9,5		10,5	9,1	11,1	9,0	18,6		20,6	21,2	21,0	19,7
16-Mar	9,1		10,3	11,9	9,9	10,3	9,7		10,4	8,8	11,1	9,4	18,8		20,7	20,7	21,0	19,7
17-Mar	9,1		10,0	11,5		10,1	10,0		10,8	9,8		9,8	19,1		20,8	21,2		19,8
18-Mar	9,1		10,1	11,3		10,3	10,1		10,5	9,3		9,3	19,2		20,5	20,7		19,6
19-Mar	9,1	7,7	8,7	11,7	9,1	11,0	10,0	13,6	12,0	8,9	11,5	8,5	19,1	21,3	20,6	20,6	20,7	19,5
20-Mar	9,1	9,3		11,2	11,2	11,2	10,2	11,3		9,4	9,2	8,3	19,2	20,5		20,7	20,4	19,5
21-Mar	9,0		9,6	12,0	11,2	11,4	9,6		10,8	8,5	9,6	8,0	18,6		20,4	20,6	20,8	19,5
22-Mar	9,1		10,3	12,6	10,6	11,0	9,4		10,0	7,9	10,3	8,5	18,4		20,3	20,5	20,9	19,5
23-Mar	9,0	7,8	10,3	12,2	10,5	11,0	10,0	12,2	10,0	8,3	10,4	8,5	19,0	20,0	20,2	20,5	20,9	19,6
24-Mar	9,2	9,8	10,2	11,8	10,1	10,6	9,1	10,5	10,0	8,7	10,8	8,9	18,3	20,3	20,2	20,5	20,9	19,5
25-Mar	9,2	10,0	10,7	12,0	9,8	10,4	9,4	10,4	9,6	8,4	11,1	9,4	18,5	20,4	20,3	20,5	20,9	19,7
26-Mar	9,1	9,7	10,0	11,3	9,8	10,5	9,5	10,7	10,4	9,4	11,1	9,2	18,5	20,5	20,4	20,7	20,9	19,7
27-Mar	8,9	9,3	10,2	10,8	9,6	10,0	10,9	11,3	10,2	10,2	11,3	9,8	19,8	20,6	20,3	21,0	20,9	19,8
28-Mar	8,9	9,5	10,2	11,6	9,7	10,4	11,4	11,0	10,4	9,0	11,2	9,2	20,3	20,5	20,6	20,6	20,9	19,6
29-Mar	9,1	9,2	10,1	11,3	10,0	10,4	10,6	11,5	10,4	9,8	10,9	9,3	19,8	20,7	20,5	21,0	20,9	19,6
30-Mar	9,2	9,0	10,0	11,8	10,0	10,3	10,7	11,5	10,6	9,1	10,8	9,3	19,9	20,6	20,6	20,9	20,8	19,6
31-Mar	9,2	8,5	10,1	11,9	9,9	10,5	10,4	11,0	10,5	8,9	11,0	9,1	19,6	19,5	20,6	20,9	20,9	19,5
<b>Totals</b>	<b>9,3</b>	<b>8,9</b>	<b>10,1</b>	<b>11,6</b>	<b>10,0</b>	<b>10,9</b>	<b>10,1</b>	<b>11,6</b>	<b>10,3</b>	<b>9,1</b>	<b>10,9</b>	<b>8,7</b>	<b>19,5</b>	<b>20,5</b>	<b>20,5</b>	<b>20,7</b>	<b>20,9</b>	<b>19,6</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 2022**

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

## Emergency Generation

**Table 9: Emergency Generation for the month of March 2022**

	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 the whole month. No fabric filter bags were replaced during the month.

#### UNIT 2

The unit base loaded for most of the days during the month and was off for fourteen days during an Outage. No fabric filter bags were replaced during the month.

#### UNIT 3

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

#### UNIT 4

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

#### UNIT 5

The unit base loaded for most of the days of the month and was off for two days. No fabric filter bags were replaced during the month.

#### UNIT 6

The unit base loaded for the whole month. Five fabric filter bags were replaced during the month.

### Complaints Register

**Table 10: Complaints for the month of March 2022**

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 complaint were received during the month of March 2022				

## General

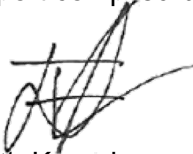
Correlation tests for Units 1,2,4,5 & 6 were completed and the station is planning to implement the new curves by 15 May 2022. Unit 3 correlation tests cannot be performed at the stage due to mills unreliability.

Fuel oil consumption for the month of March 2022 exceeded the AEL limit of 6000/tons and the Station is busy with a comprehensive an action plan to address the high fuel oil consumption.

There was an exceedance on the Sulphur content for the month of February and March 2022. An investigation will be conducted, and the action plan will be made available.

Yours sincerely

Report compiled by:



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

Date 11/04/2022

Report verified by:



Duni Rapudi  
**BOILER ENGINEERING MANAGER: (MAJUBA)**

Date 11/04/2022

Report approved by:



Sinothi Buthelezi  
**ENGINEERING MANAGER (A): (MAJUBA)**

12/04/2022

Date