

Mr Dan Hlanyane
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Date: 11 February 2021

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Dear Mr. Hlanyane

MAJUBA POWER STATION'S REVISED MONTHLY EMISSIONS REPORT FOR THE MONTH OF OCTOBER 2020

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 October 2020. Verified emissions of particulates are included. SO₂ and NO_x (as NO₂) 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. This report was revised due to the parallel test curves that were back-fitted on all gaseous emissions monitors. Unity factors were used for CO₂ instead of correction factors as CO₂ values were over-and/or understated on Units 2, 3 and 5. The Unit 5 gaseous emissions monitor was reading incorrect values as identified during the parallel test that was conducted in October 2020. An average from the parallel test report was used for Unit 5 gaseous emissions.

Raw Materials and Products

Table 1. Quantity of Raw Materials and Products used/produced for the month of October 2020

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption/ Rate in Month of October 2020
	Coal	Tons/month	1 800 000	1 255 769
	Fuel Oil	Tons/month	6 000	2 921
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity - MW)	Production Rate in Month of October 2020
	Energy	GWh	4 110	2 341
	Ash	Tons/month	Not stated in the license	362 917

Abatement Technology

Table 2. Abatement Equipment Control Technology for the month of October 2020

Associated Unit	Technology Type	Actual Utilisation (%) for the month of October 2020	*Minimum Control Efficiency (%)
Unit 1	Fabric Filter Plant	100	99.95%

Unit 2	Fabric Filter Plant	100	99.92%
Unit 3	Fabric Filter Plant	100	99.92%
Unit 4	Fabric Filter Plant	100	99.92%
Unit 5	Fabric Filter Plant	100	99.94%
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 October 2020

Characteristic	Stipulated Range (Unit)	Monthly Average Content
Sulphur Content	0.6 to >0.94%	Not available
Ash Content	28 to >30%	28.9%

*Sulphur content is not available due to low data recovery on the continuous analyser and a faulty sulphur analyser in the coal lab.

Emissions Reporting

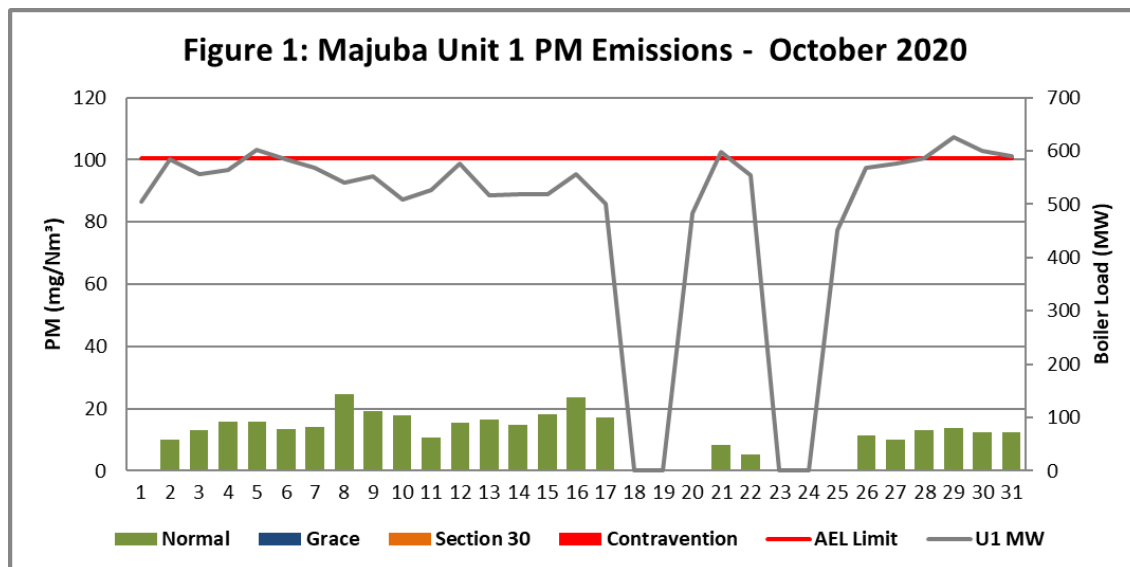


Figure 1. Particulate Matter emissions (daily averages) for the month of October 2020 against emission limit for Unit 1.

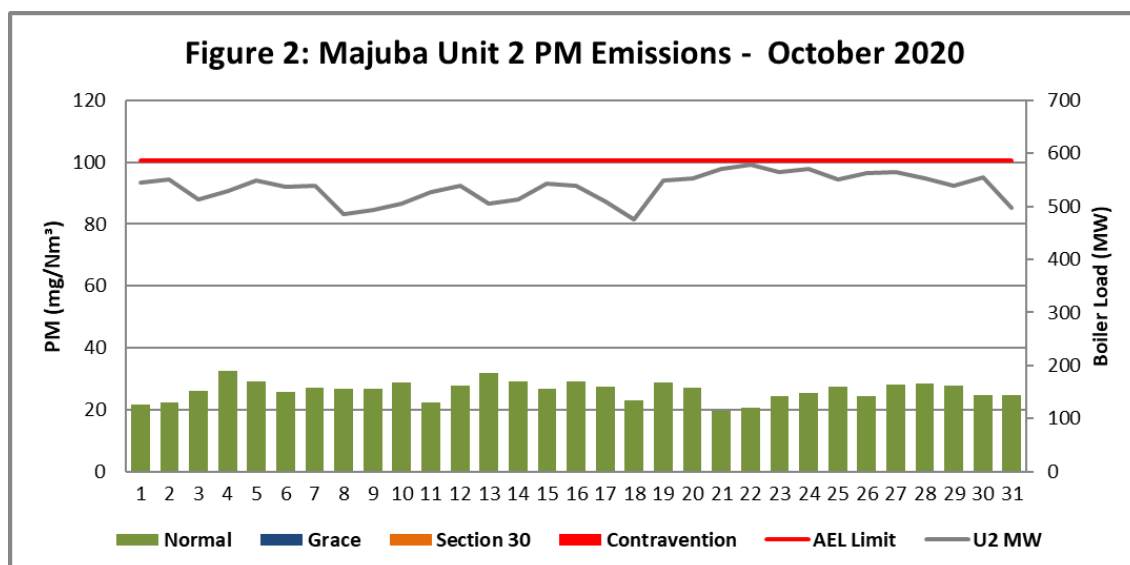


Figure 2. Particulate Matter emissions (daily averages) for the month of October 2020 against emission limit for Unit 2

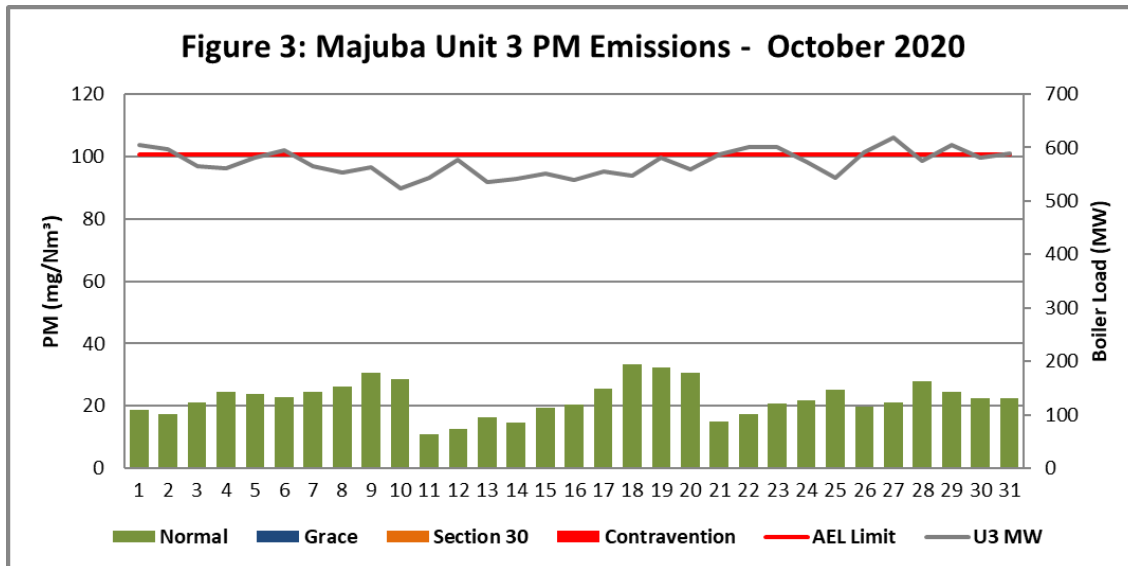


Figure 3. Particulate Matter emissions (daily averages) for the month of October 2020 against emission limit for Unit 3.

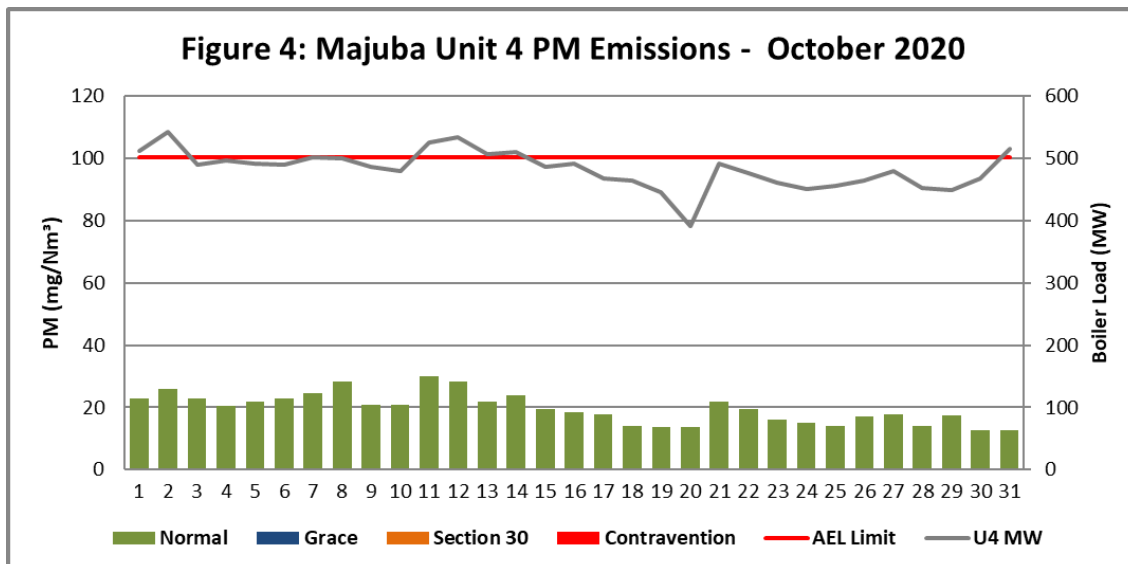


Figure 4. Particulate Matter emissions (daily averages) for the month of October 2020 against emission limit for Unit 4

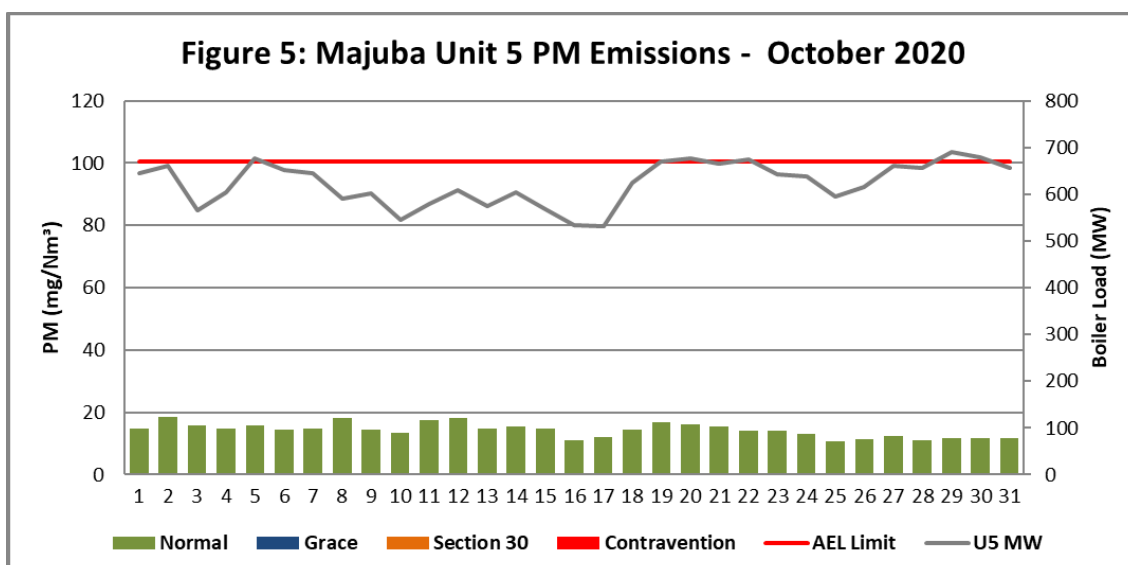


Figure 5. Particulate Matter emissions (daily averages) for the month of October 2020 against emission limit for Unit 5

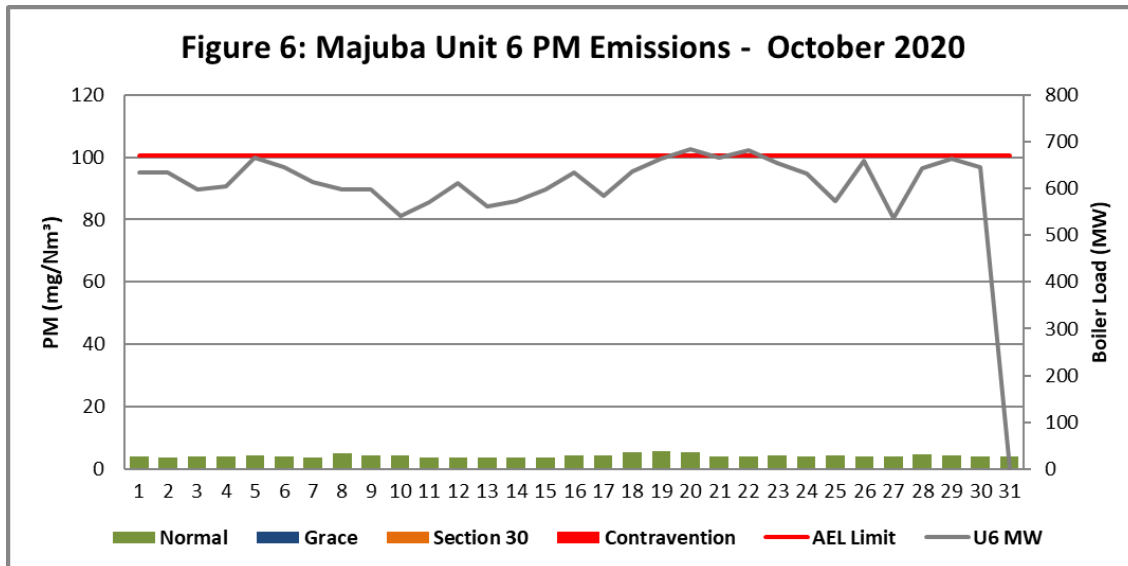


Figure 6. Particulate Matter emissions (daily averages) for the month of October 2020 against emission limit for Unit 6

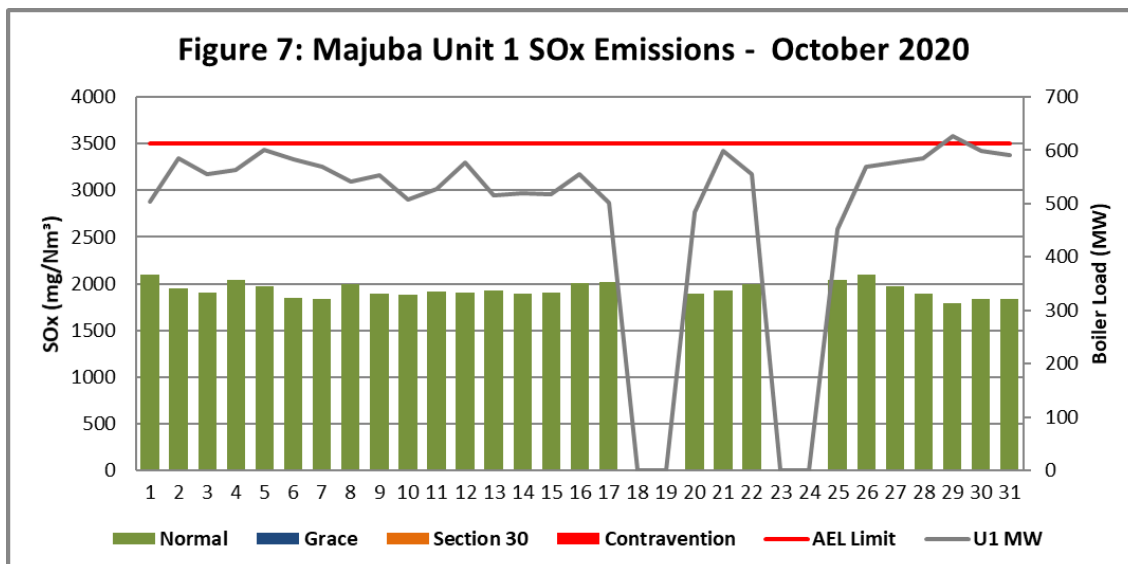


Figure 7. SOx emissions (daily averages) for the month of October 2020 against emission limit for Unit 1.

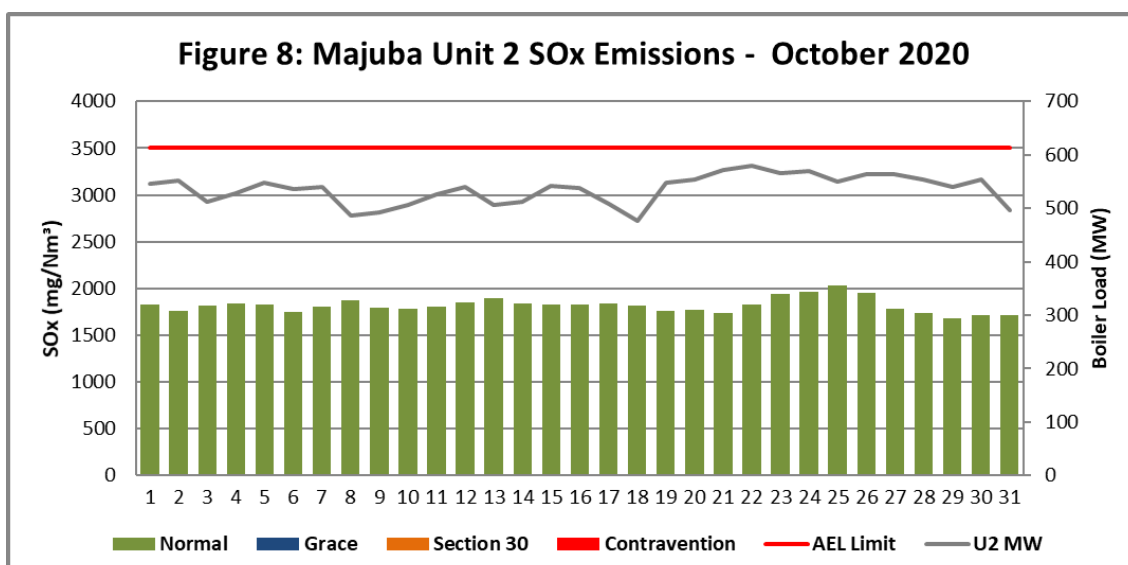


Figure 8. SOx emissions (daily averages) for the month of October 2020 against emission limit for Unit 2

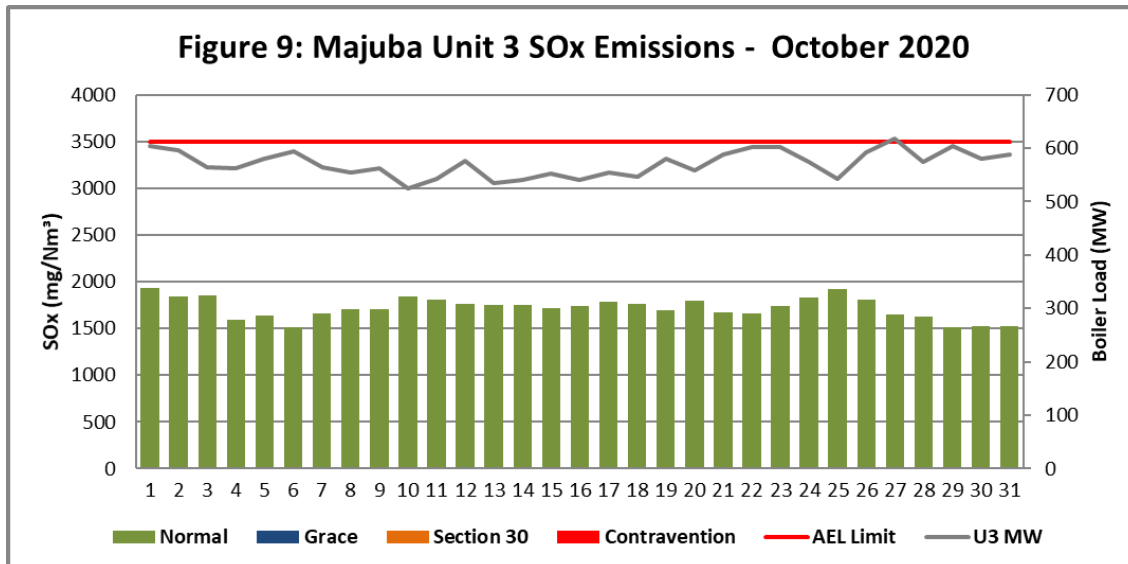


Figure 9. SOx emissions (daily averages) for the month of October 2020 against emission limit for Unit 3.

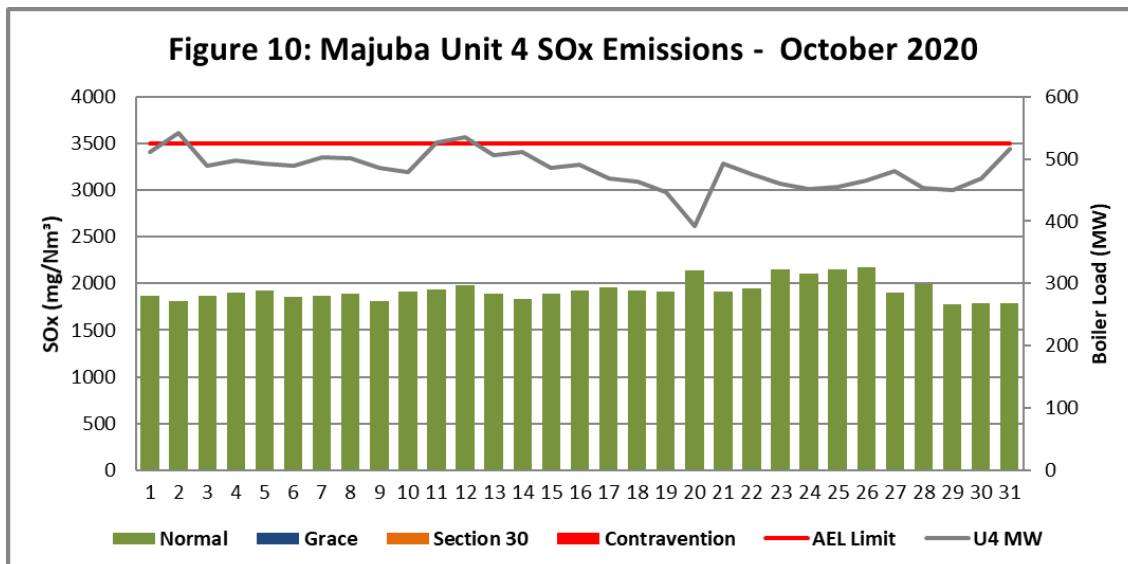


Figure 10. SOx emissions (daily averages) for the month of October 2020 against emission limit for Unit 4

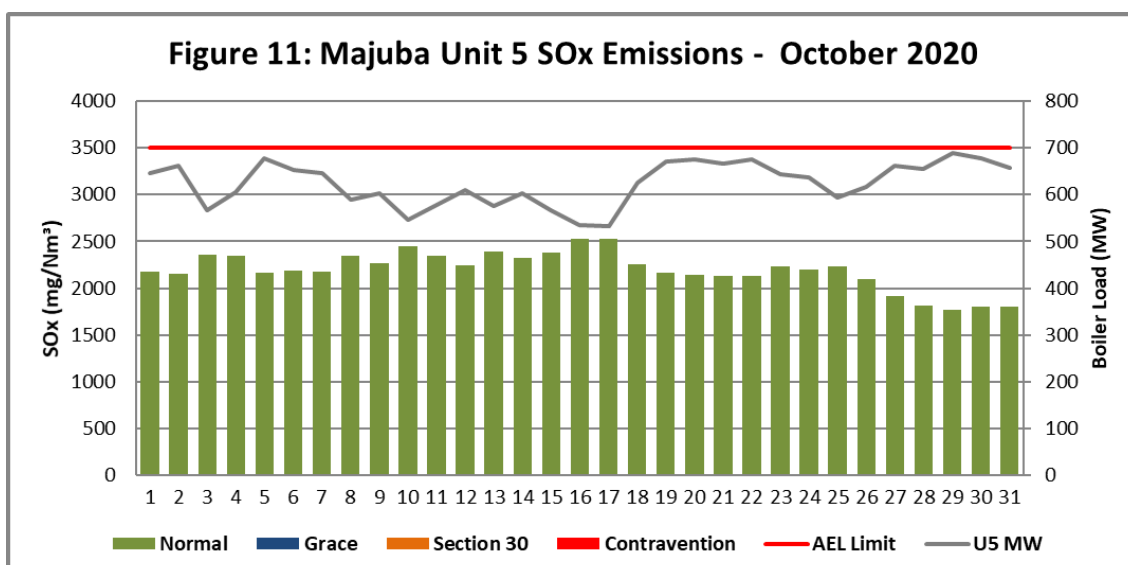


Figure 11. SOx emissions (daily averages) for the month of October 2020 against emission limit for Unit 5

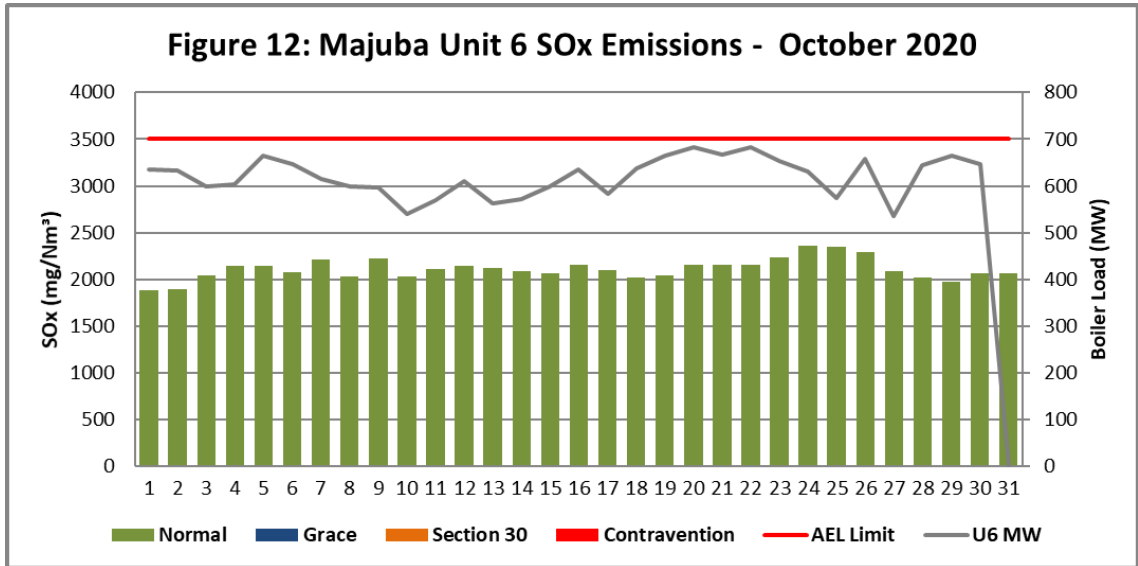


Figure 12. SOx emissions (daily averages) for the month of October 2020 against emission limit for Unit 6

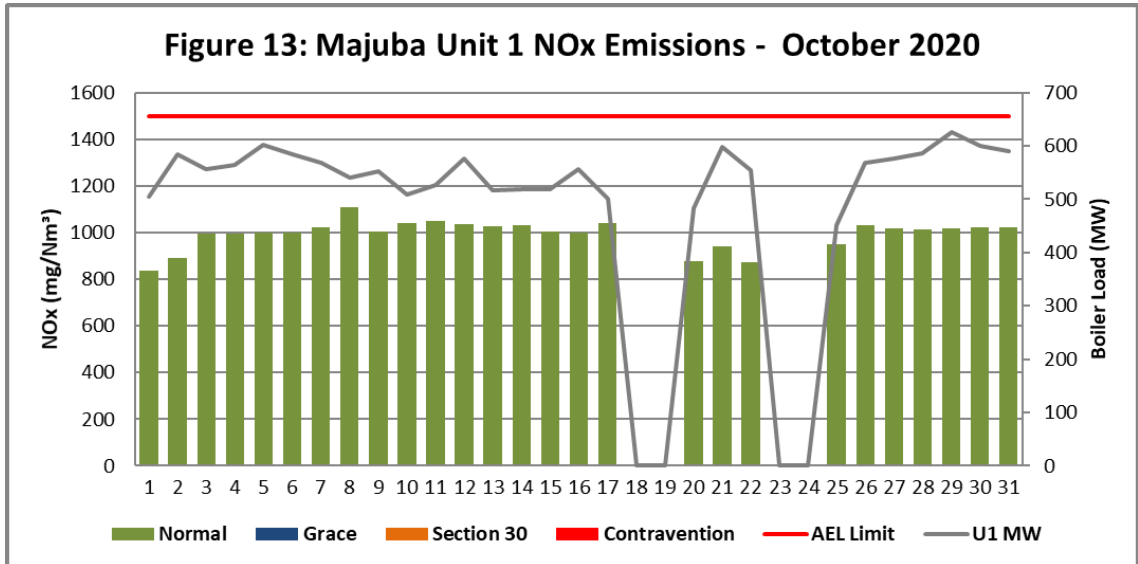


Figure 13. NOx emissions (daily averages) for the month of October 2020 against emission limit for Unit 1.

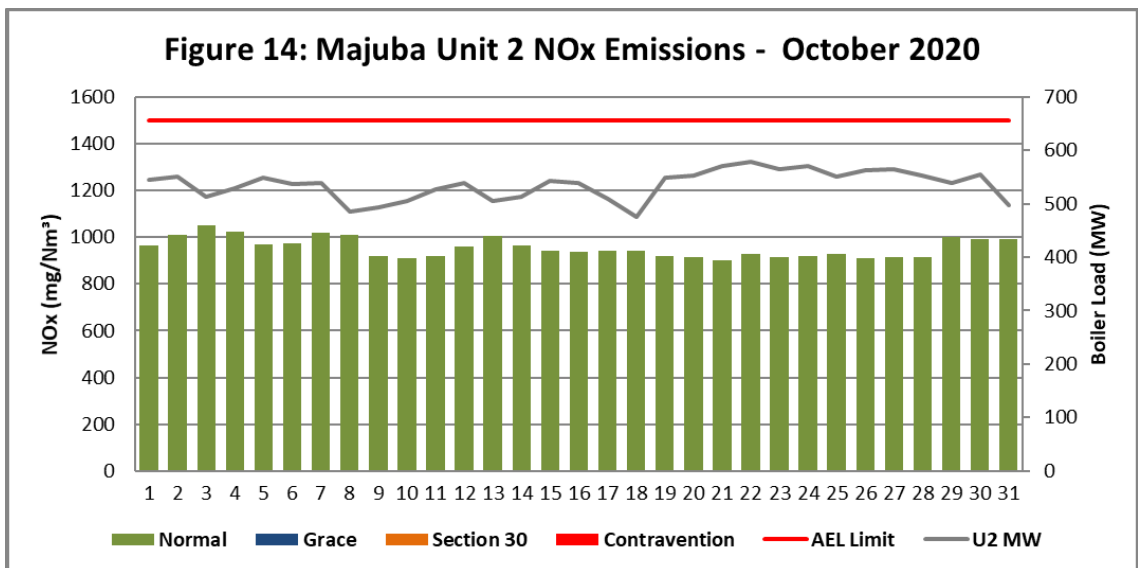


Figure 14. NOx emissions (daily averages) for the month of October 2020 against emission limit for Unit 2

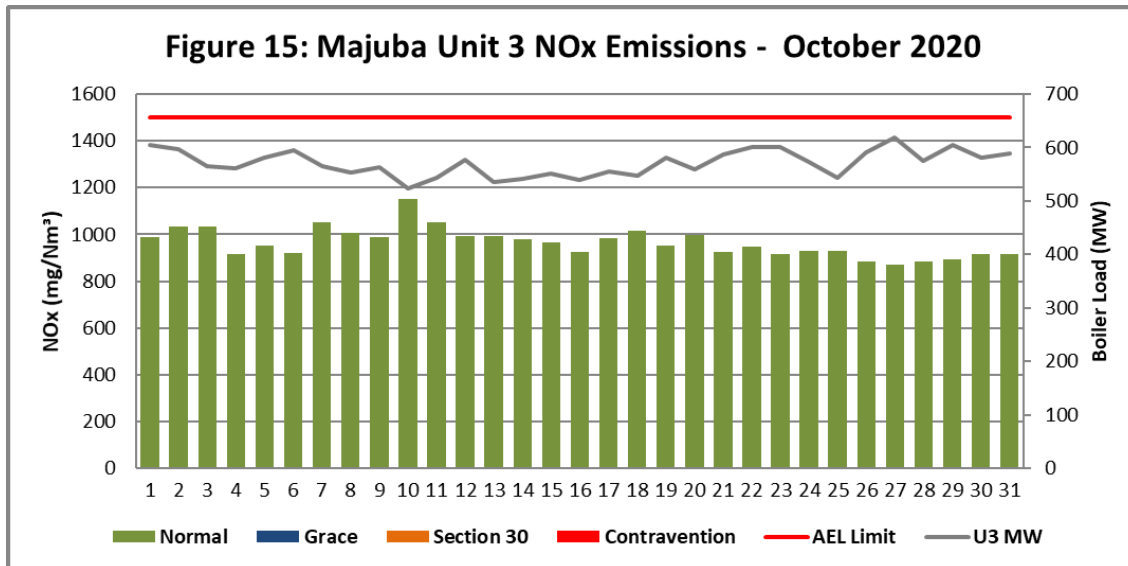


Figure 15. NOx emissions (daily averages) for the month of October 2020 against emission limit for Unit 3.

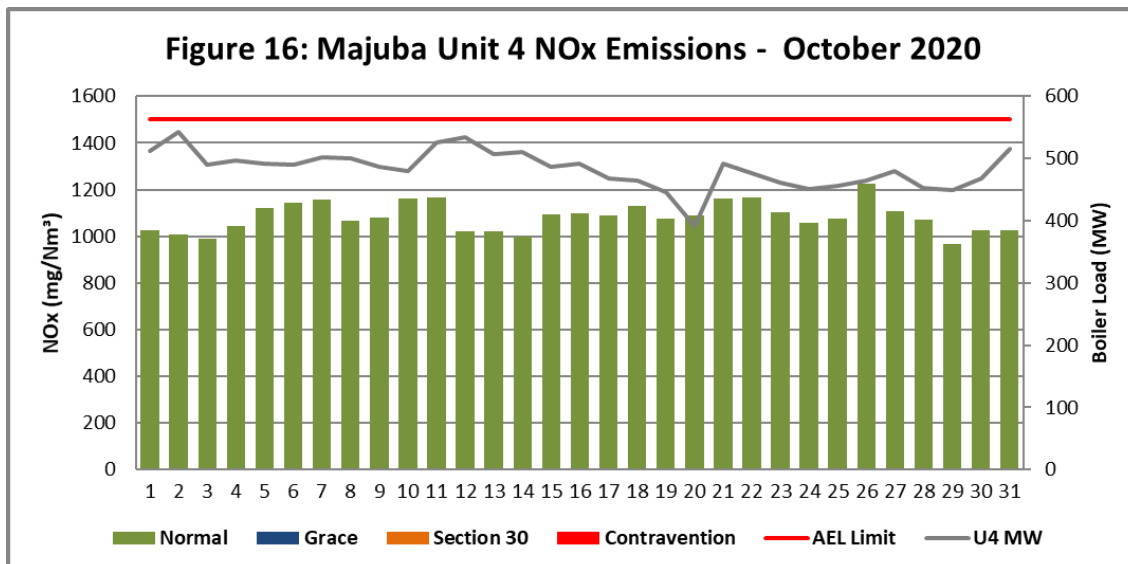


Figure 16. NOx emissions (daily averages) for the month of October 2020 against emission limit for Unit 4

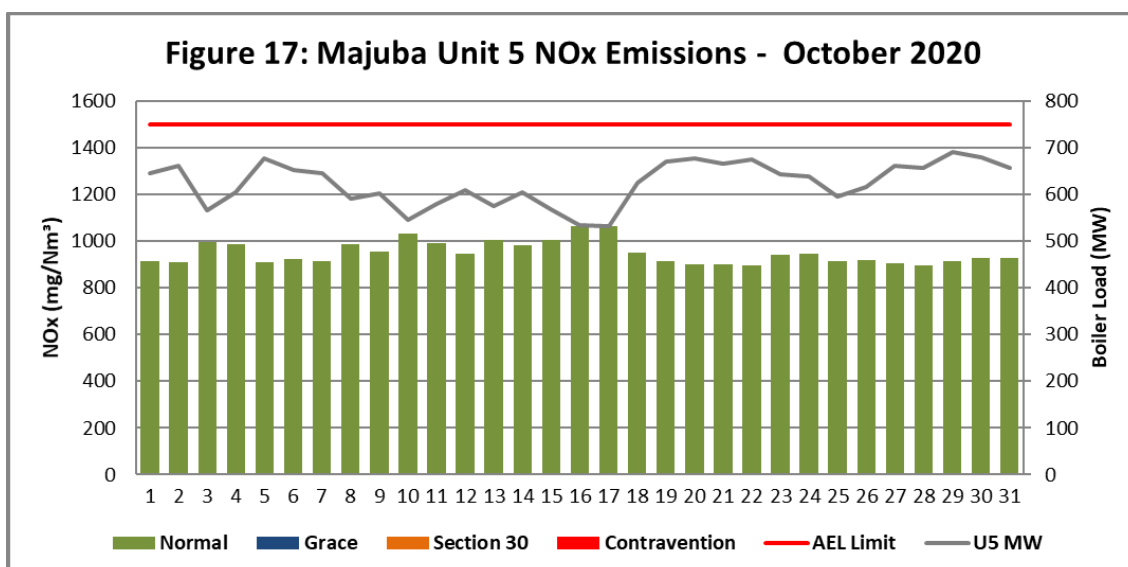


Figure 17. NOx emissions (daily averages) for the month of October 2020 against emission limit for Unit 5

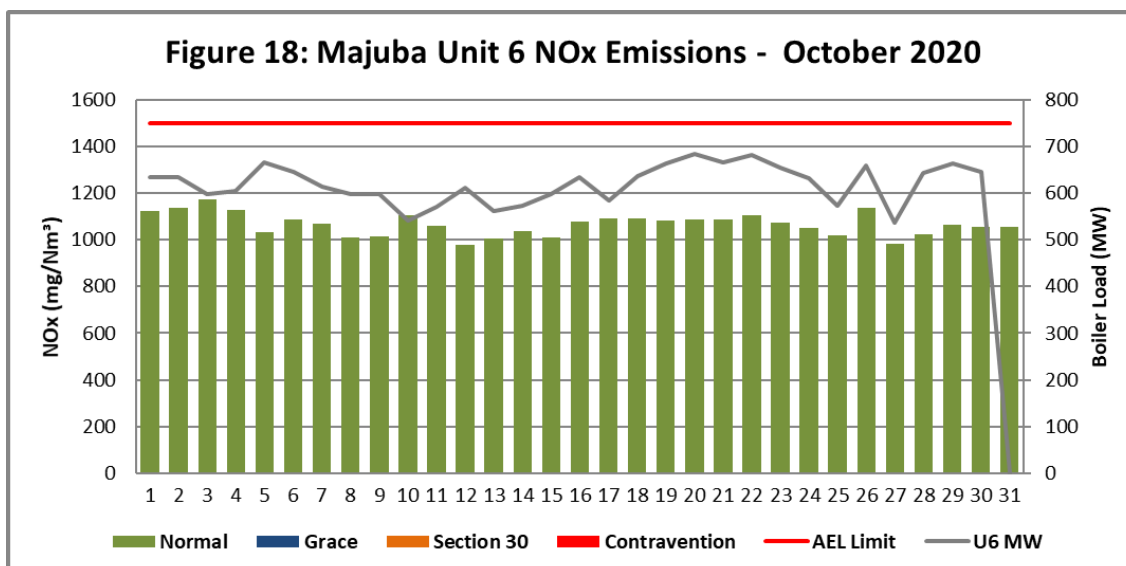


Figure 18. NOx emissions (daily averages) for the month October 2020 against emission limit for Unit 6

Table 4: Monthly tonnages for the month of October 2020

Unit	PM (tons)	SO ₂ (tons)	NO _x (tons)
1	21.5	3 213	1 665
2	42.5	3 036	1 584
3	44.7	3 473	1 944
4	39.0	3 910	2 195
5	35.6	5 566	2 411
6	9.8	5 114	2 586
Sum	193.1	24 313	12 386

Table 5: Average monthly concentrations (mg/Nm³) for the month of October 2020

Unit	PM (Mg/Nm ³)	SO ₂ (Mg/Nm ³)	NO ₂ (Mg/Nm ³)
1	14.3	1 939.5	995.5
2	26.1	1 841.7	954.7
3	22.2	1 721.7	964.9
4	20.0	1 929.5	1 081.6
5	14.4	2 196.1	949.3
6	4.2	2 113.4	1 066.7

Table 6: Each unit and respective days operating in compliance to the AEL Emission Limits (SO_x, NO_x and PM)

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance
Unit 1	24	0	0	0	0
Unit 2	31	0	0	0	0
Unit 3	31	0	0	0	0
Unit 4	31	0	0	0	0
Unit 5	31	0	0	0	0
Unit 6	31	0	0	0	0

CO₂ and O₂ Relationship

Date	Final Average CO ₂ (%)						Final Average O ₂ (%)						Final Average CO ₂ + O ₂ (%)						
	U1	U2	U3	U4	U5	U6	U1	U2	U3	U4	U5	U6	U1	U2	U3	U4	U5	U6	
01-Oct		10.5	12.0	10.3	11.7	12.7		9.5	10.5	9.1	10.0	7.7	7.7		20.9	21.1	20.3	19.4	20.4
02-Oct	11.0	10.0	11.9	10.8	11.6	12.4		9.1	11.2	9.5	9.4	7.6	8.0	20.1	21.1	21.4	20.2	19.3	20.4
03-Oct	10.5	9.5	11.4	10.1	10.8	12.1		9.5	12.1	10.1	10.3	8.7	8.4	20.1	21.5	21.4	20.4	19.5	20.5
04-Oct	10.6	9.9	11.2	9.9	11.0	12.1		9.3	11.4	9.8	10.6	8.7	8.3	19.9	21.3	21.0	20.5	19.6	20.4
05-Oct	11.2	10.2	11.6	10.1	11.8	12.7		8.7	10.9	9.2	10.5	7.7	7.6	19.9	21.2	20.8	20.6	19.5	20.4
06-Oct	11.0	10.1	11.7	10.2	11.6	12.6		8.8	11.1	8.8	10.4	7.8	7.7	19.9	21.2	20.5	20.5	19.4	20.3
07-Oct	10.8	9.8	11.3	10.3	11.7	12.4		9.2	11.5	9.8	10.2	7.7	7.9	19.9	21.2	21.1	20.5	19.4	20.3
08-Oct	10.1	9.1	10.9	10.2	10.9	12.2		10.0	12.4	10.6	10.1	8.7	8.2	20.1	21.5	21.4	20.3	19.7	20.3
09-Oct	10.4	9.5		10.2				9.3	11.7	10.2	10.2	8.3	8.0	19.8	21.2	10.2	20.4	8.3	8.0
10-Oct	9.8	9.7		9.9				10.1	11.5	11.2	10.6	9.2	8.9	19.9	21.2	11.2	20.5	9.2	8.9
11-Oct	9.9	9.8		10.2				10.3	11.4	10.5	10.4	8.7	8.6	20.2	21.2	10.5	20.6	8.7	8.6
12-Oct	10.7	10.0		10.7				9.3	11.1	10.0	9.5	8.1	8.0	20.0	21.1	10.0	20.2	8.1	8.0
13-Oct	10.1	9.5		10.4				9.7	11.9	10.8	10.1	8.9	8.5	19.9	21.4	10.8	20.5	8.9	8.5
14-Oct	10.2	9.8	11.1	10.4	10.9	12.1		9.8	11.6	10.6	10.1	8.5	8.6	20.0	21.3	21.7	20.5	19.4	20.6
15-Oct	10.2	10.4	11.0	10.2	10.4	11.7		9.7	10.6	10.4	10.1	9.0	8.6	20.0	21.0	21.4	20.3	19.3	20.3
16-Oct	10.8	10.3	11.1	10.2	9.9	12.7		9.3	10.7	10.1	10.1	9.7	7.6	20.1	21.0	21.2	20.4	19.6	20.3
17-Oct	10.0	9.7	11.1	10.1	10.0	12.2		10.3	11.5	10.4	10.4	9.7	8.2	20.4	21.1	21.6	20.6	19.7	20.4
18-Oct		9.6	10.8	10.2	11.1	12.5			11.6	10.7	10.6	8.3	7.7		21.3	21.5	20.8	19.4	20.2
19-Oct		10.5	11.4	9.9	11.5	12.8			10.3	9.8	10.6	7.8	7.6		20.8	21.2	20.6	19.3	20.3
20-Oct		10.5	11.2	9.4	11.6	12.9		9.8	10.3	10.2	11.7	7.6	7.6		20.8	21.4	21.1	19.2	20.5
21-Oct	11.3	10.7	11.9	10.2	11.9	12.8		8.6	10.2	9.2	10.3	7.5	7.7	19.9	20.9	21.0	20.4	19.4	20.5
22-Oct	11.0	10.7	11.7	10.0	11.9	12.8		8.8	10.1	8.9	10.4	7.5	7.7	19.9	20.8	20.6	20.4	19.3	20.5
23-Oct		10.7	11.6	10.1	11.5	12.6			10.1	8.9	10.4	8.0	7.9		20.8	20.5	20.5	19.5	20.5
24-Oct		10.7	11.3	9.7	11.5	12.5			10.1	9.3	10.9	7.9	7.9		20.8	20.6	20.6	19.5	20.4
25-Oct		10.3	11.0	9.7	11.1	11.7		9.9	10.6	10.1	11.0	8.5	8.8		20.9	21.1	20.6	19.6	20.5
26-Oct	10.8	10.4	11.6	9.8	11.3	12.5		9.1	10.4	9.1	11.1	8.3	7.9	19.9	20.8	20.7	20.9	19.6	20.4
27-Oct	11.1	10.6	11.8	10.1	11.7	11.6		8.9	10.2	8.8	10.3	7.6	8.5	20.0	20.8	20.6	20.5	19.3	20.1
28-Oct	11.1	10.4	11.5	9.9	11.7	12.6		8.9	10.4	9.2	11.2	7.5	7.7	20.0	20.8	20.7	21.1	19.2	20.3
29-Oct	11.2	10.1	11.6	9.8	11.7	12.7		8.6	10.8	8.9	10.7	7.6	7.6	19.8	21.0	20.6	20.5	19.3	20.3
30-Oct	11.2	10.2	11.5	9.5	11.8	12.6		8.7	10.7	9.1	11.2	7.7	7.8	19.9	20.9	20.6	20.7	19.5	20.4
31-Oct	11.1	9.7	11.5	10.0	11.7			9.0	11.8	9.6	10.5	7.8		20.1	21.5	21.0	20.5	19.5	
Totals	10.7	10.1	11.4	10.1	11.3	12.4		9.3	11.0	9.8	10.4	8.2	8.0	20.0	21.1	19.3	20.5	17.7	18.4

Calculation: CO₂% + O₂% = 19.5-21.5%

Table 7: CO₂ and O₂ deviations of the Month of October 2020

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

Comments on the performance and availability of each unit

Emergency Generation

Table 8: Emergency Generation for the month of October 2020

	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 days of the month and was off for four days. Nine fabric filter bags were replaced during the month.

UNIT 2

The unit base loaded the entire month. Twenty-six fabric filter bags were replaced during the month.

UNIT 3

The unit base loaded for the entire month. Sixty-five fabric filter bags were replaced during the month.

UNIT 4

The unit base loaded for the entire month. Fourteen fabric filter bags were replaced during the month.

UNIT 5

The unit base loaded for the entire month. No fabric filter bags were replaced during the month.

UNIT 6

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

Complaints Register

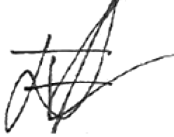
Table 9: Complaints for the month of October 2020

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	Date by which measure will be implemented
	No complaints were received in the month of October 2020				

General

Additional information demonstrating compliance with the emission license conditions is supplied in the annual emission reports sent to your office.

Report compiled by:



Faith Kagoda
ENVIRONMENTAL MANAGER: (MAJUBA)

Date 11/02/2021

Report verified by:

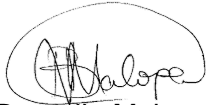


Lindani Madonsela
BOILER ENGINEERING MANAGER: (MAJUBA)

Date 16/02/2021

Hoping the above will meet your satisfaction

Yours sincerely



Bawinile Malope
ENGINEERING MANAGER: (MAJUBA)

2021/02/22
Date