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Date: 12 July 2021

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Dear Mr. Hlanyane

MAJUBA POWER STATION'S MONTHLY EMISSIONS REPORT FOR THE MONTH OF JUNE 2021

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 June 2021. 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.

Raw Materials and Products

Table 1. Quantity of Raw Materials and Products used/produced for the month of June 2021

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption/ Rate in Month of June 2021
	Coal	Tons/month	1 800 000	966 049
	Fuel Oil	Tons/month	6 000	6 413.29
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity - MW)	Production Rate in Month of June 2021
	Energy	GWh	4 110	1 762.94
	Ash	Tons/month	Not stated in the license	266 630

Abatement Technology

Table 2. Abatement Equipment Control Technology for the month of June 2021

Associated Unit	Technology Type	Actual Utilisation (%) for the month of June 2021	*Minimum Control Efficiency (%)
Unit 1	Fabric Filter Plant	100	99.98%
Unit 2	Fabric Filter Plant	100	99.94%
Unit 3	Fabric Filter Plant	100	99.95%
Unit 4	Fabric Filter Plant	100	99.92%
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. Unit 2 was returned to service on 30 June 2021 after being on outage. The unit did not achieve full load during this period.

Energy Source Characteristics

Table 3. Energy Source Material Characteristics for the month of June 2021

Characteristic	Stipulated Range (Unit)	Monthly Average Content
Sulphur Content	0.6 to >0.94%	1.0%
Ash Content	28 to >30%	27.6%

Emissions Reporting

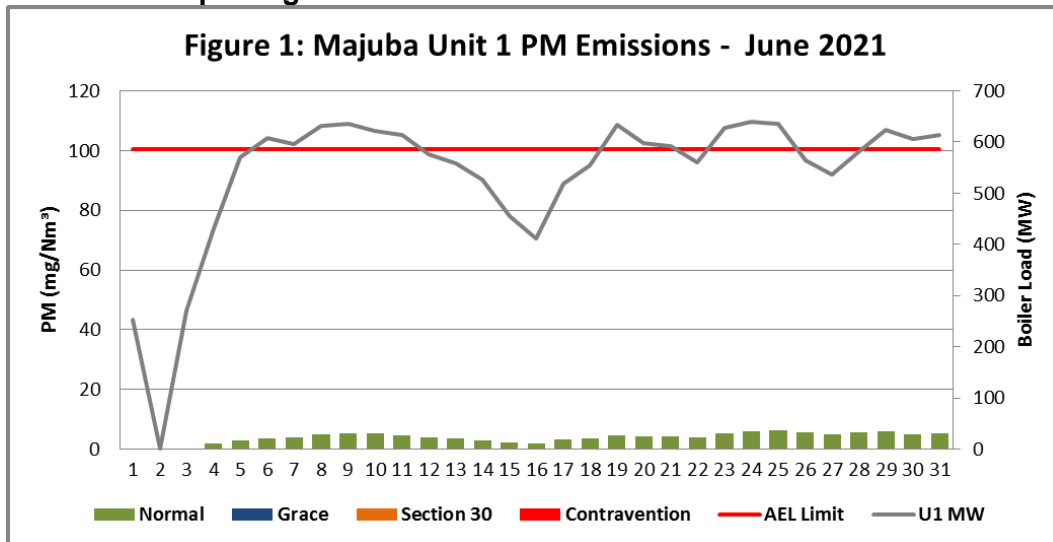


Figure 1. Particulate Matter emissions (daily averages) for the month of June 2021 against emission limit for Unit 1.

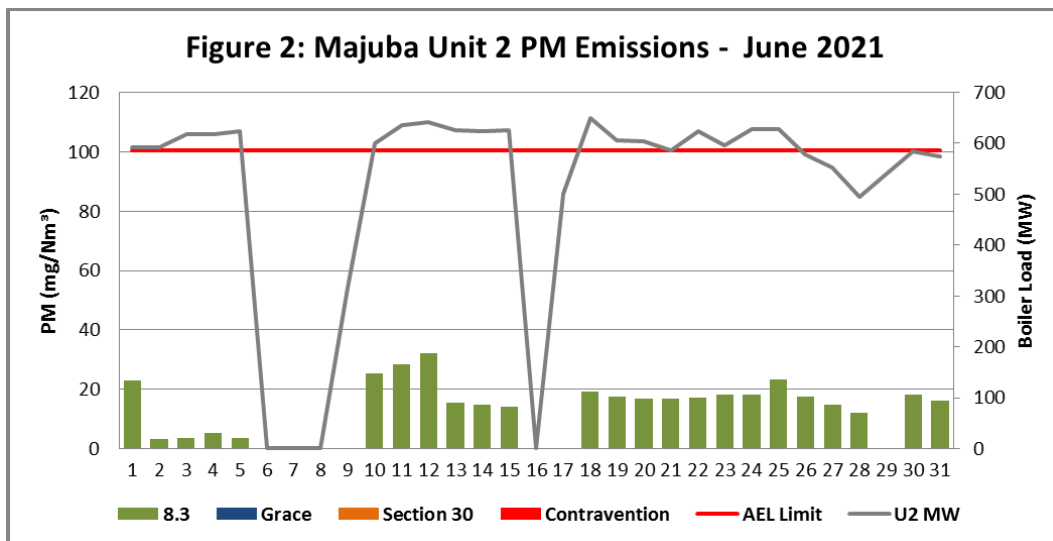


Figure 2. Particulate Matter emissions (daily averages) for the month of June 2021 against emission limit for Unit 2.

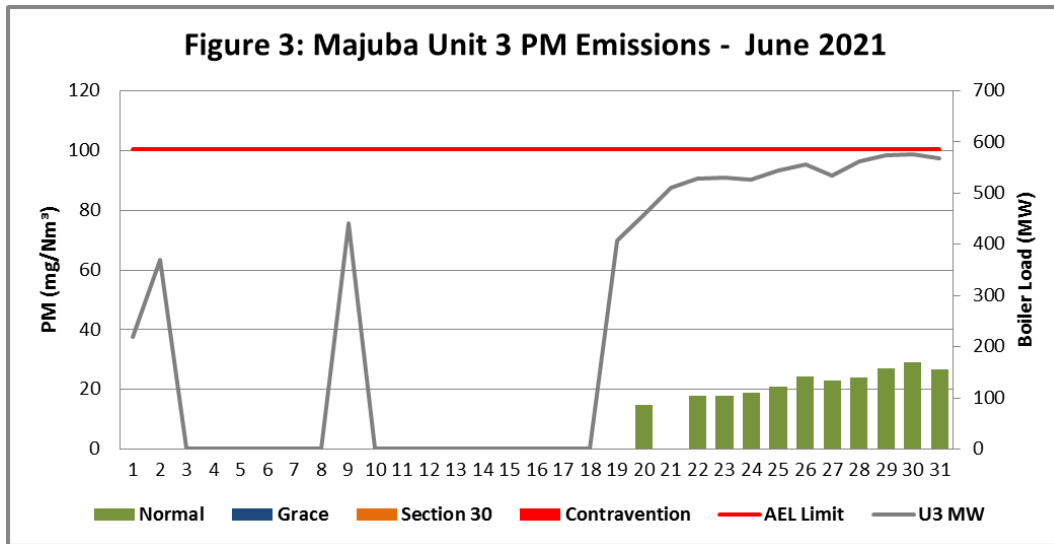


Figure 3. Particulate Matter emissions (daily averages) for the month of June 2021 against emission limit for Unit 3.

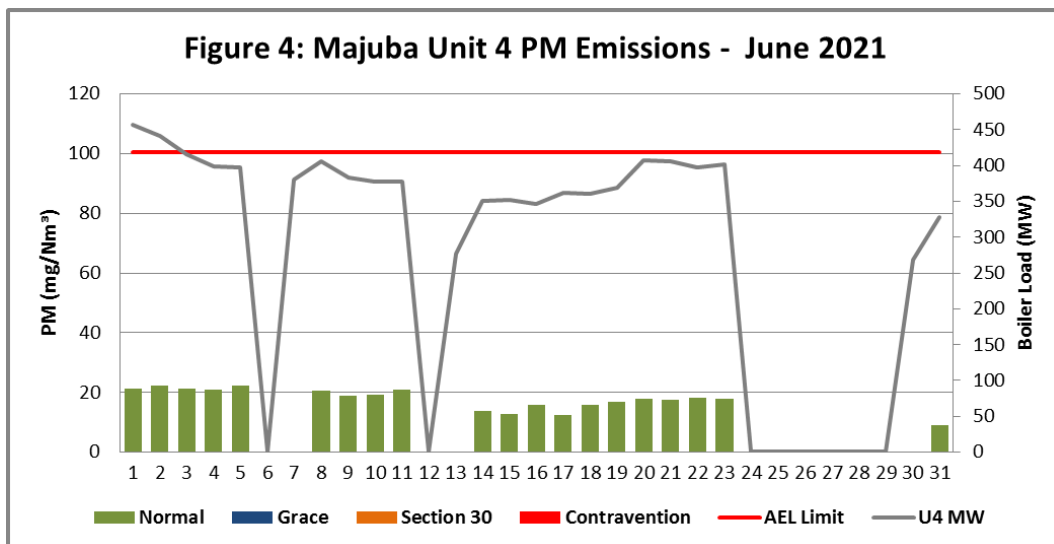


Figure 4. Particulate Matter emissions (daily averages) for the month of June 2021 against emission limit for Unit 4.

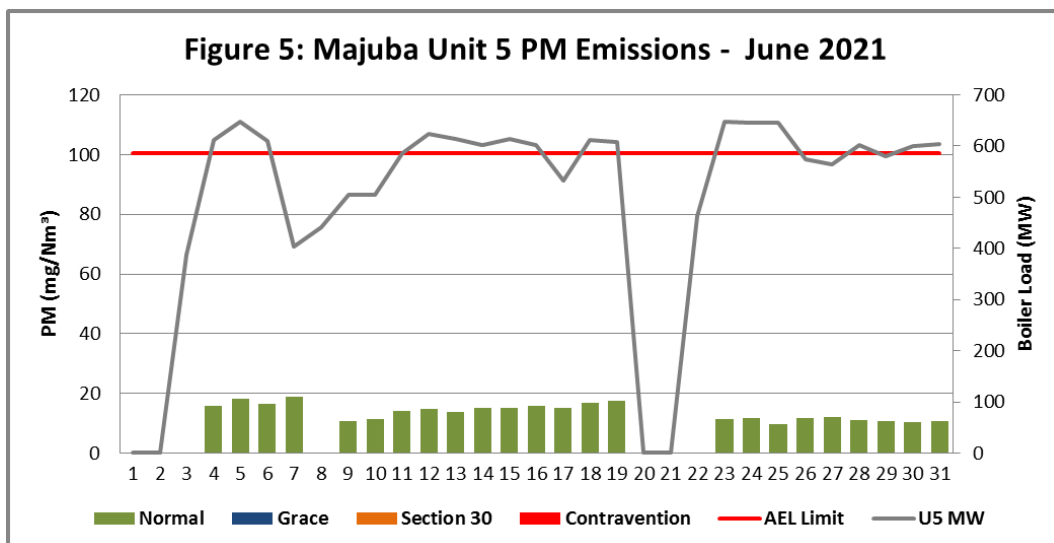


Figure 5. Particulate Matter emissions (daily averages) for the month of June 2021 against emission limit for Unit 5.

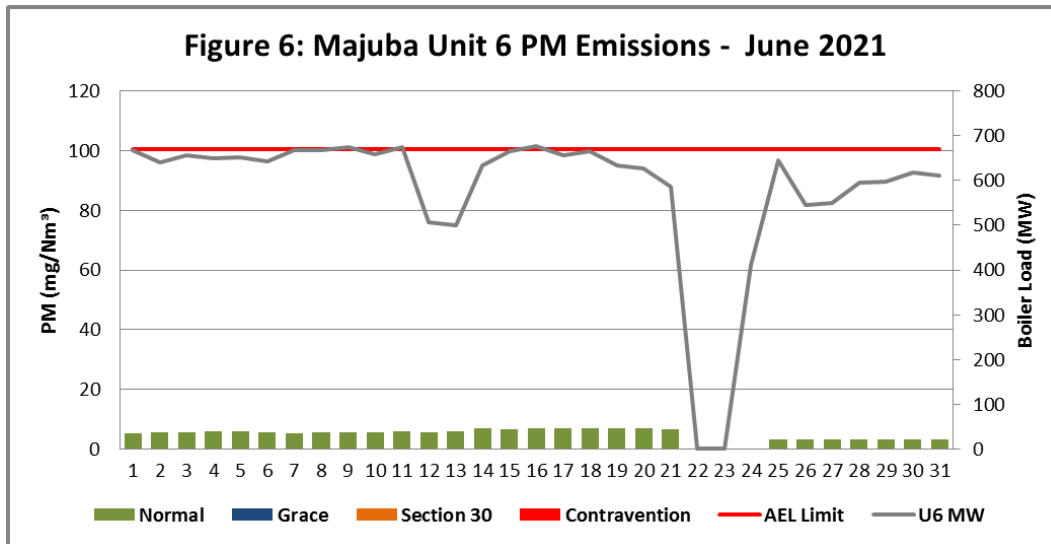


Figure 6. Particulate Matter emissions (daily averages) for the month of June 2021 against emission limit for Unit 6.

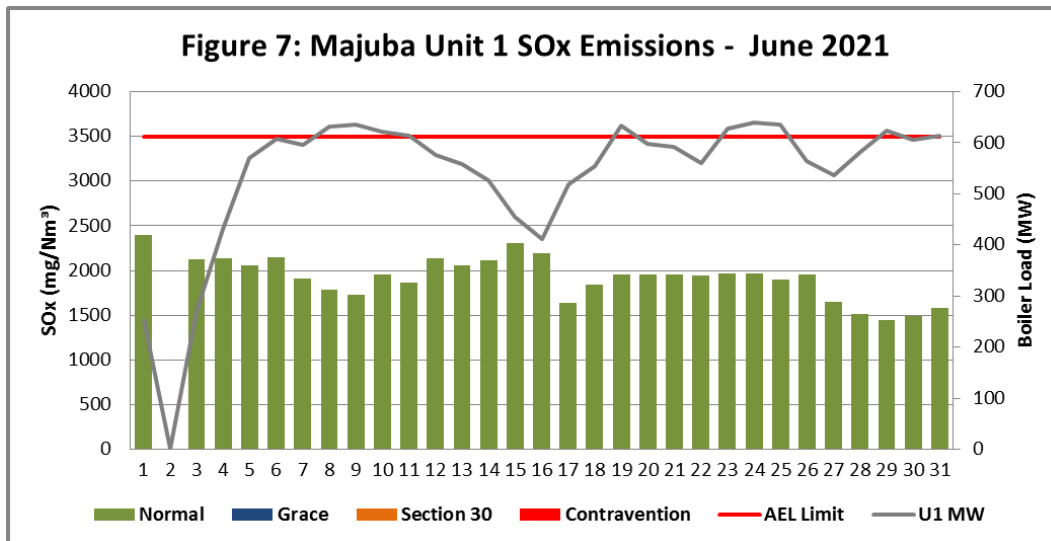


Figure 7. SOx emissions (daily averages) for the month of June 2021 against emission limit for Unit 1.

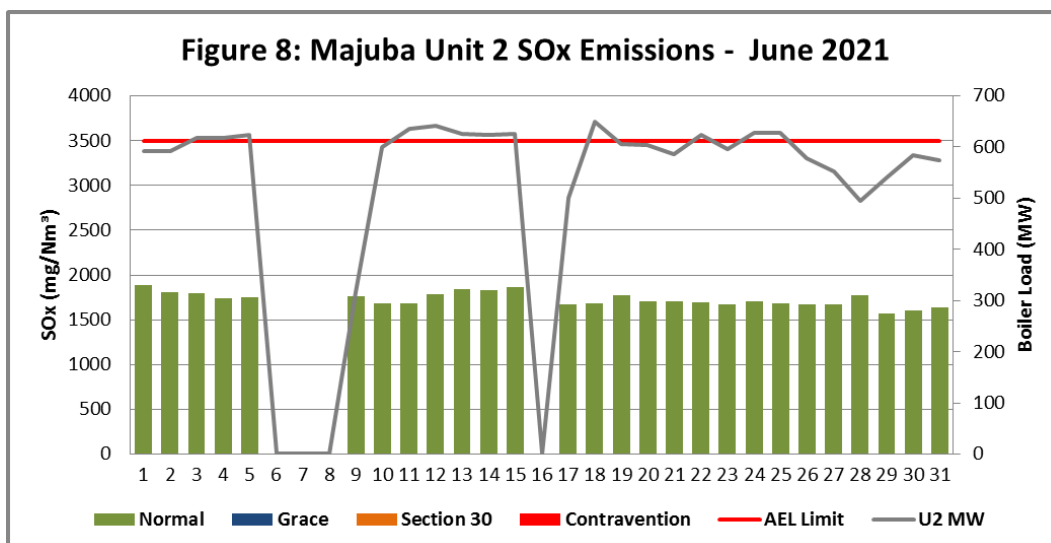


Figure 8. SOx emissions (daily averages) for the month of June 2021 against emission limit for Unit 2.

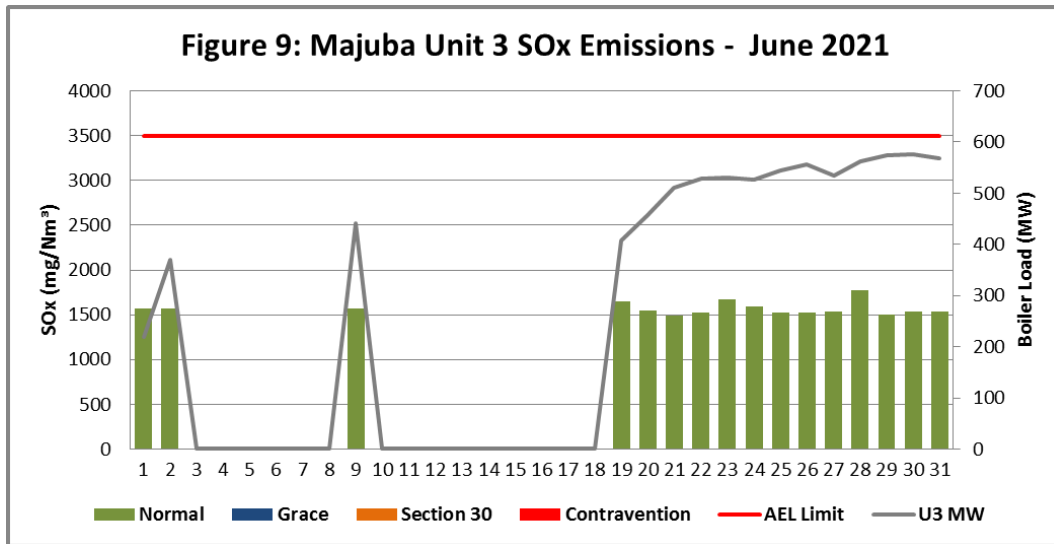


Figure 9. SOx emissions (daily averages) for the month of June 2021 against emission limit for Unit 3.

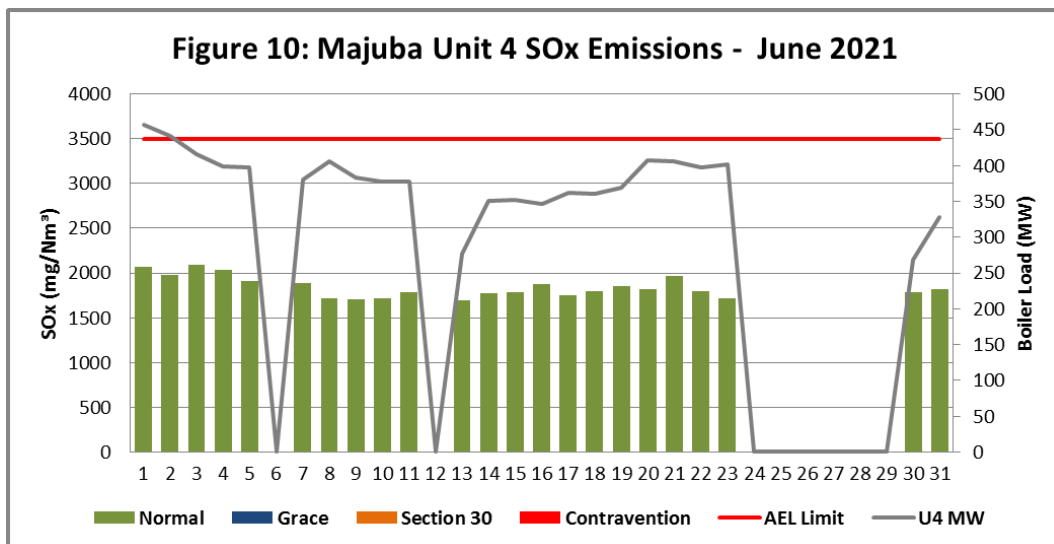


Figure 10. SOx emissions (daily averages) for the month of June 2021 against emission limit for Unit 4.

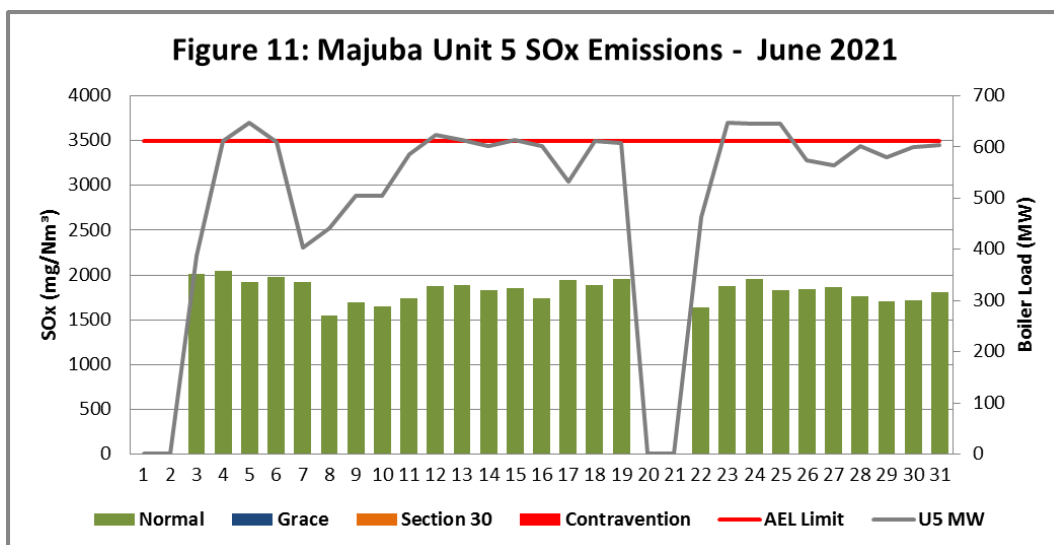


Figure 11. SOx emissions (daily averages) for the month of June 2021 against emission limit for Unit 5.

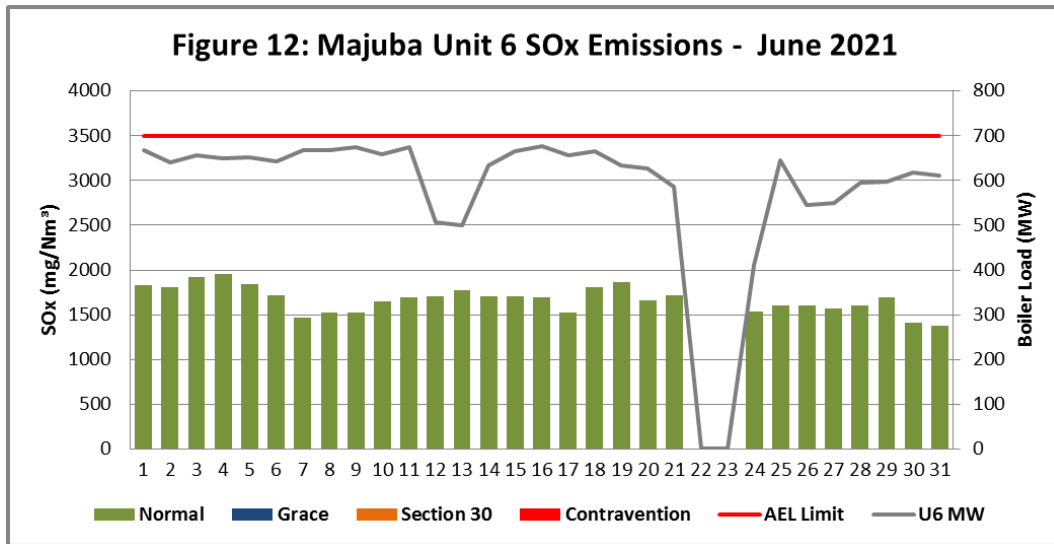


Figure 12. SOx emissions (daily averages) for the month of June 2021 against emission limit for Unit 6.

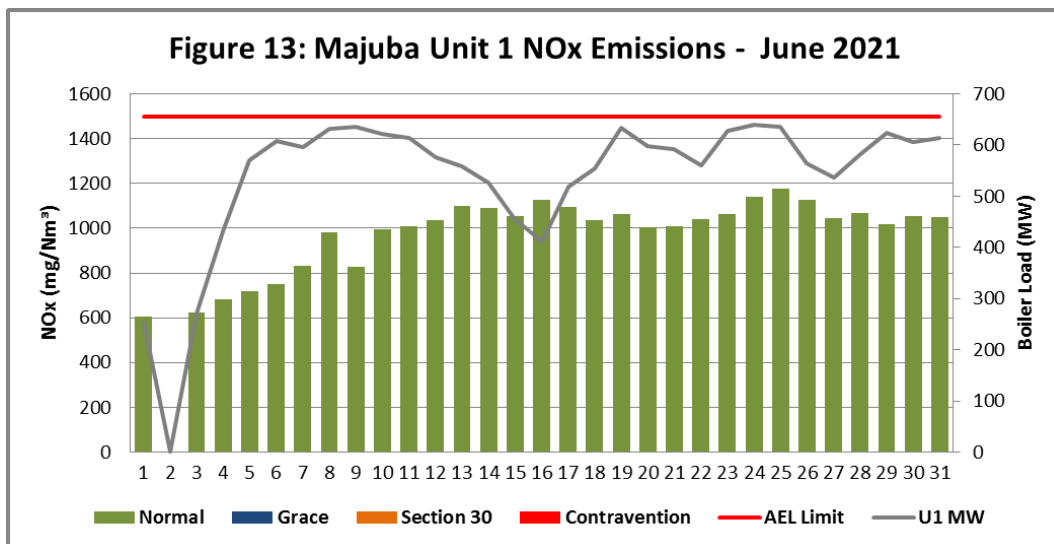


Figure 13. NOx emissions (daily averages) for the month of June 2021 against emission limit for Unit 1.

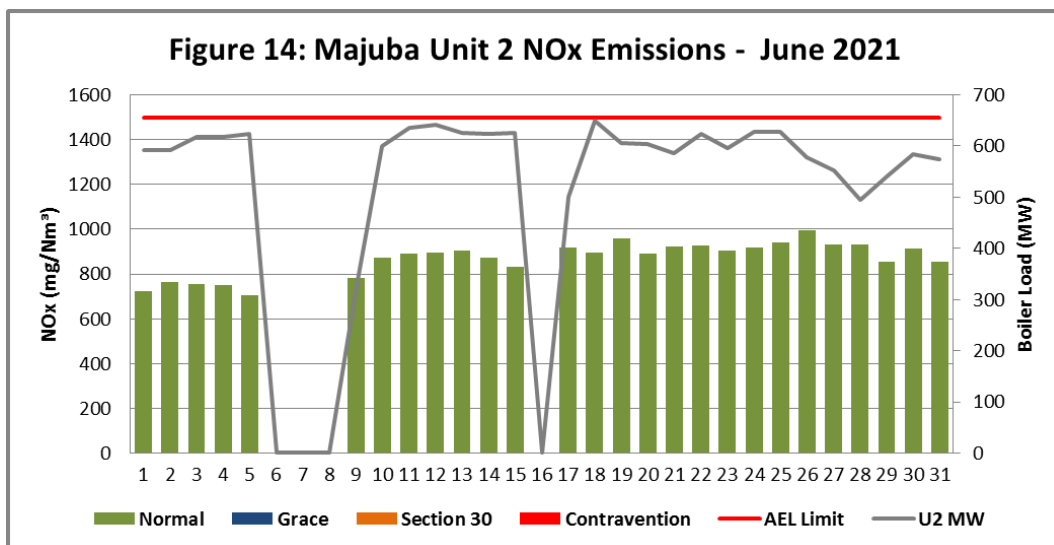


Figure 14. NOx emissions (daily averages) for the month of June 2021 against emission limit for Unit 2.

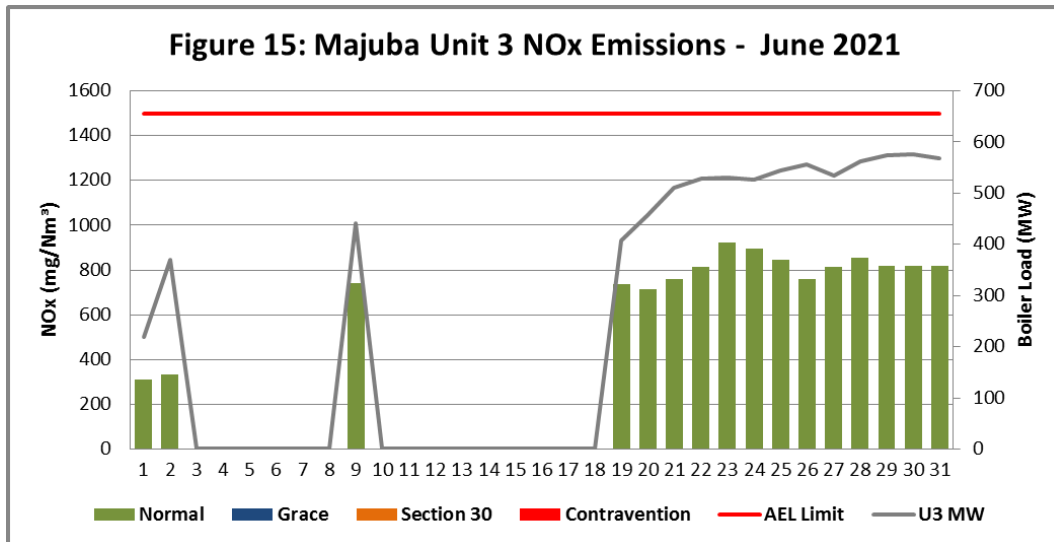


Figure 15. NOx emissions (daily averages) for the month of June 2021 against emission limit for Unit 3.

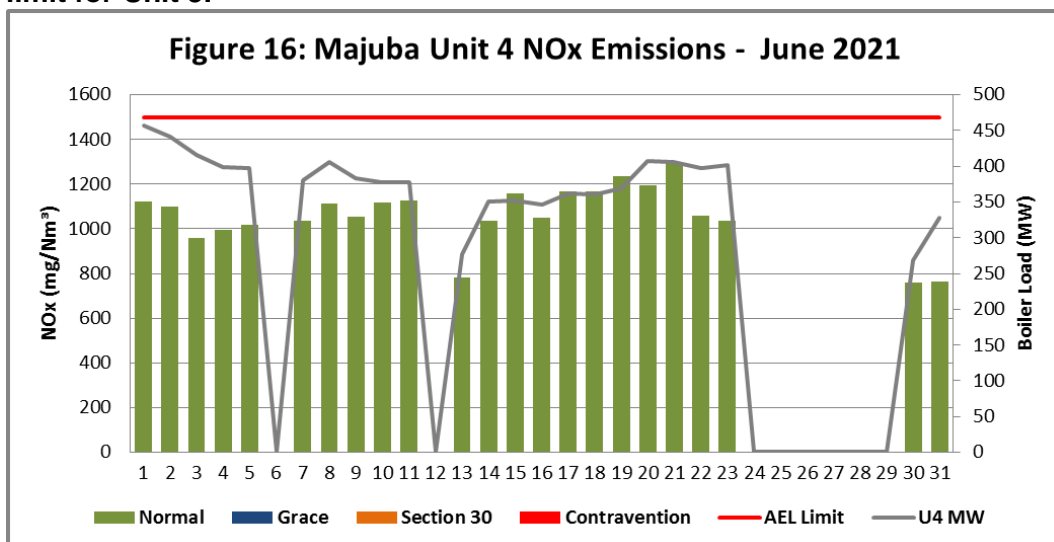


Figure 16. NOx emissions (daily averages) for the month of June 2021 against emission limit for Unit 4

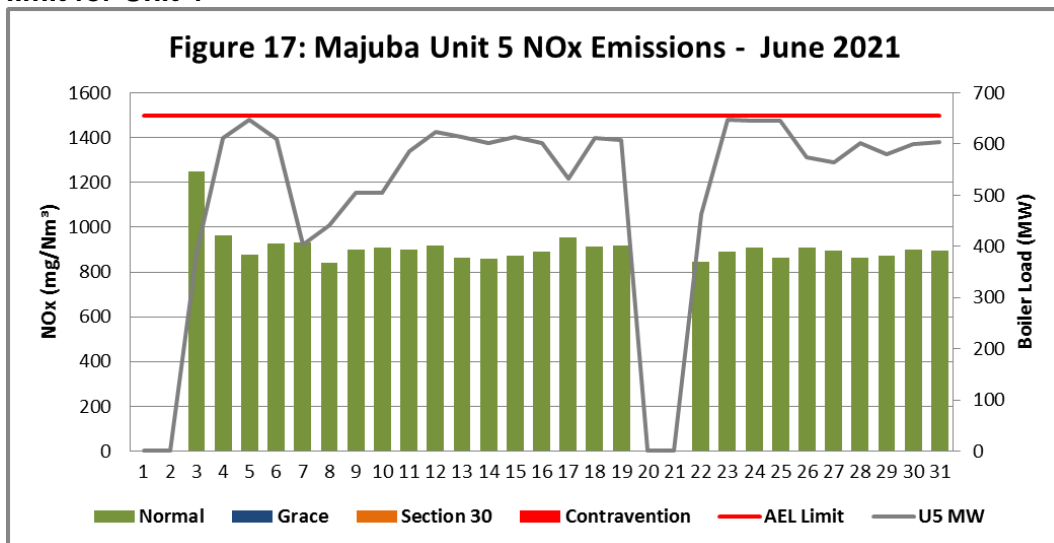


Figure 17. NOx emissions (daily averages) for the month of June 2021 against emission limit for Unit 5

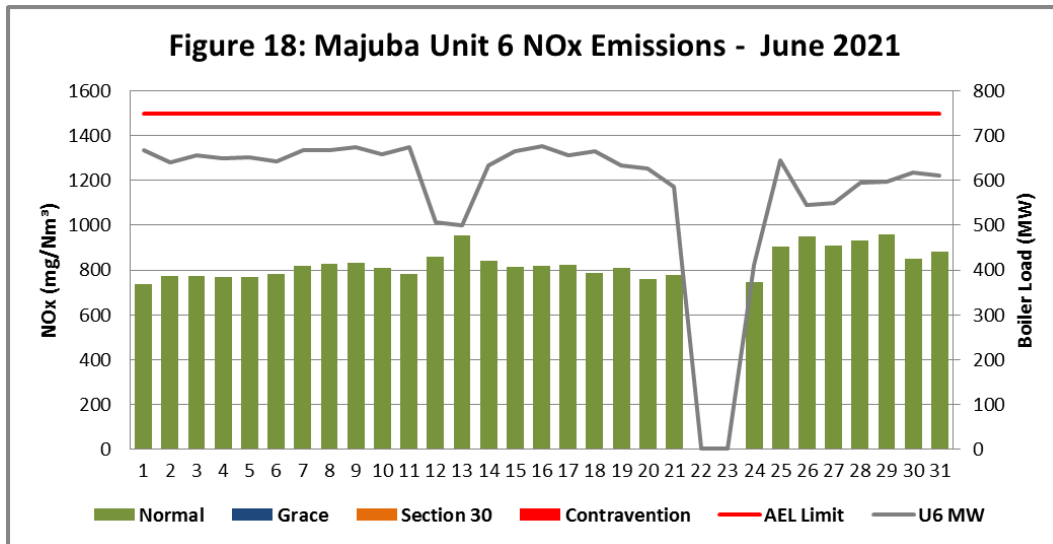


Figure 18. NOx emissions (daily averages) for the month June 2021 against emission limit for Unit 6

Table 4: Monthly tonnages for the month of June 2021

Unit	PM (tons)	SO ₂ (tons)	NO _x (tons)
1	8.8	3 894	2 049
2	23.9	2 856	1 445
3	12.8	1 086	560
4	17.6	2 090	1 232
5	23.8	3 657	1 790
6	11.3	3 532	1 730
Sum	98.2	17 116	8 805

Table 5: Average monthly concentrations (mg/Nm³) for the month of June 2021

Unit	PM (Mg/Nm ³)	SO ₂ (Mg/Nm ³)	NO ₂ (Mg/Nm ³)
1	4.3	1 934.2	978.3
2	16.4	1 730.0	871.4
3	21.8	1 572.7	742.0
4	18.3	1 842.1	1 071.6
5	13.8	1 833.8	909.2
6	5.5	1 681.7	827.4

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	30	0	0	0	0
Unit 2	27	0	0	0	0
Unit 3	16	0	0	0	0
Unit 4	23	0	0	0	0
Unit 5	27	0	0	0	0
Unit 6	29	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-Jun	8.8	11.5	7.7	8.9		12.9	13.7	9.0	12.5	11.3		7.0	22.4	20.5	20.3	20.2		19.9
02-Jun		11.4	8.9	9.0		12.7		9.3	11.6	11.2		7.5		20.7	20.5	20.1		20.2
03-Jun	7.4	11.6		8.3	8.0	12.9	12.8	9.1		11.9	12.2	7.2	20.2	20.6		20.2	20.2	20.1
04-Jun	8.5	11.6		8.0	10.9	12.8	11.6	8.9		12.2	8.7	7.3	20.1	20.4		20.2	19.6	20.1
05-Jun	10.1	11.9		8.3	11.9	12.9	9.9	8.4		11.9	7.1	7.1	19.9	20.3		20.1	19.0	19.9
06-Jun	10.6				11.5	12.9	9.5				8.2	7.3	20.1				19.7	20.2
07-Jun	10.5			8.6	9.7	12.9	9.5			11.4	10.0	7.3	20.0			20.0	19.7	20.2
08-Jun	11.1			8.4	9.9	12.8	8.6			11.7	9.2	7.4	19.7			20.1	19.0	20.2
09-Jun	11.2	8.2		8.3	10.5	12.9	8.7	12.0	10.8	11.9	8.9	7.3	19.9	20.1	10.8	20.1	19.4	20.2
10-Jun	10.9	11.5		8.0	10.3	12.9	9.5	9.2		12.4	8.9	7.1	20.3	20.7		20.4	19.1	20.0
11-Jun	10.6	11.8		8.0	11.3	13.0	9.2	9.1		12.3	7.7	7.0	19.8	20.9		20.3	19.0	20.0
12-Jun	10.1	11.9			11.8	11.9	9.8	9.1			7.8	8.3	19.9	21.0			19.6	20.3
13-Jun	9.8	11.7		8.1	11.9	11.7	10.1	9.3		11.8	7.3	8.9	19.9	21.0		19.9	19.2	20.6
14-Jun	9.7	11.8		8.3	11.9	12.7	10.3	9.2		12.0	6.9	7.6	20.0	20.9		20.3	18.8	20.3
15-Jun	8.9	12.1		7.6	12.0	12.9	12.1	8.8		12.8	7.0	7.2	21.0	20.8		20.4	19.0	20.1
16-Jun	8.5			7.6	12.0	12.9	11.7			12.7	7.3	7.1	20.2			20.3	19.3	20.0
17-Jun	9.4	10.2		7.4	11.1	12.9	10.6	9.9		13.0	8.2	7.1	20.0	20.1		20.4	19.2	20.0
18-Jun	10.0	12.0		7.4	12.1	13.1	9.9	8.3		13.0	7.8	7.4	19.9	20.3		20.4	19.8	20.4
19-Jun	11.0	11.5	9.5	7.5	11.6	13.0	8.9	9.0	11.1	13.1	8.2	7.6	19.9	20.5	20.7	20.6	19.9	20.6
20-Jun	10.9	11.8	10.4	8.0		12.9	8.9	8.6	10.1	12.3		7.6	19.7	20.4	20.5	20.3		20.5
21-Jun	10.5	11.2	11.1	7.9		12.6	9.3	9.3	9.5	13.0		7.8	19.8	20.5	20.6	20.9		20.4
22-Jun	10.2	11.7	10.7	8.2	10.1		9.7	8.6	10.1	11.8	8.2		19.9	20.4	20.9	20.0	18.3	
23-Jun	10.8	11.2	10.6	8.4	12.0		8.9	9.1	10.6	11.5	7.4		19.7	20.2	21.2	19.8	19.4	
24-Jun	11.1	11.7	10.5		11.9	10.2	8.6	8.8	10.3		7.9	9.1	19.7	20.4	20.8		19.8	19.3
25-Jun	10.9	11.5	10.8		12.0	12.6	8.9	8.8	9.7		7.2	7.5	19.8	20.3	20.5		19.2	20.1
26-Jun	9.8	11.1	11.3		11.2	11.4	10.3	9.5	9.4		8.2	9.2	20.1	20.6	20.7		19.4	20.6
27-Jun	9.8	11.1	11.1		11.3	11.4	10.0	9.4	9.9		8.4	9.3	19.8	20.4	21.0		19.7	20.7
28-Jun	10.5	10.5	11.5		11.6	11.9	9.2	9.9	9.3		7.2	8.7	19.7	20.4	20.7		18.8	20.6
29-Jun	11.0	11.0	11.3		11.4	12.2	8.6	9.0	9.0		7.3	8.3	19.7	20.0	20.4		18.8	20.6
30-Jun	10.7	11.4	11.4	8.0	11.6	12.5	9.0	9.2	9.2	12.3	7.6	7.8	19.7	20.6	20.5	20.2	19.1	20.2
Totals	10.1	11.3	10.5	8.1	11.2	12.5	9.9	9.2	10.2	12.1	8.1	7.7	20.0	20.5	20.7	20.2	19.3	20.2

Calculation: CO₂% + O₂% = 19.5-21.5%

Table 7: CO₂ and O₂ deviations of the Month of June 2021

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

Emergency Generation

Table 8: Emergency Generation for the month of June 2021

	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 month and was off for one day. No fabric filter bags were replaced this month.

UNIT 2

The unit base loaded for most of the month and was off for four days. Twelve fabric filter bags were replaced this month.

UNIT 3

The unit came back from outage and base loaded from 19 – 31 June 2021. No fabric filter bags were replaced this month.

UNIT 4

The unit base loaded for most of the month and was off for eight days. Twenty-one fabric filter bags were replaced this month.

UNIT 5

The unit base loaded for most of the month and was off for four days. Three fabric filter bags were replaced this month.

UNIT 6

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

Complaints Register

Table 9: Complaints for the month of June 2021

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 was received during the month of June 2021				

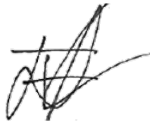
General

There was a decline in fuel oil consumption for the month of June 2021 compared to the previous two months. However, fuel oil used exceeded the authorised limit of 6000 tons/month with the June 2021 usage recorded as 6 413.29 tons. The station continues to implement measures to improve fuel oil consumption.

The coal Sulphur content for the month of June 2021 was 1.0% which exceeded the AEL limit of 0.94%. The station will investigate and identify the root cause to prevent reoccurrence.

Yours sincerely

Report compiled by:



Faith Kagoda
ENVIRONMENTAL MANAGER: (MAJUBA)

Date 12/07/2021

Report verified by:



Lindani Madonsela
BOILER ENGINEERING MANAGER: (MAJUBA)

Date 12/07/2021

Report approved by:



Londi Mthembu
ENGINEERING MANAGER: (MAJUBA)

2021/07/12

Date