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 Gert Sibande District Municipality
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Date: 11 February 2022

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Dear Mr. Hlanyane

MAJUBA POWER STATION'S MONTHLY EMISSIONS REPORT FOR THE MONTH OF JANUARY 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 January 2022. 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 January 2022

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption/ Rate in Month of January 2022
	Coal	Tons/month	1 800 000	980 451.68
	Fuel Oil	Tons/month	6 000	10 550.3
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity - MW)	Production Rate in Month of January 2022
	Energy	GWh	4 110	1 776.24
	Ash	Tons/month	Not stated in the license	270 604.66

Abatement Technology

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

Associated Unit	Technology Type	Actual Utilisation (%) for the month of January 2022	*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	99.94%
Unit 4	Fabric Filter Plant	100	99.99%
Unit 5	Fabric Filter Plant	100	99.95%
Unit 6	Fabric Filter Plant	100	99.99%

*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 January 2022

Characteristic	Stipulated Range (Unit)	Monthly Average Content
Sulphur Content	0.6 to >0.94%	0.9%
Ash Content	28 to >30%	27.6%

Emissions Reporting

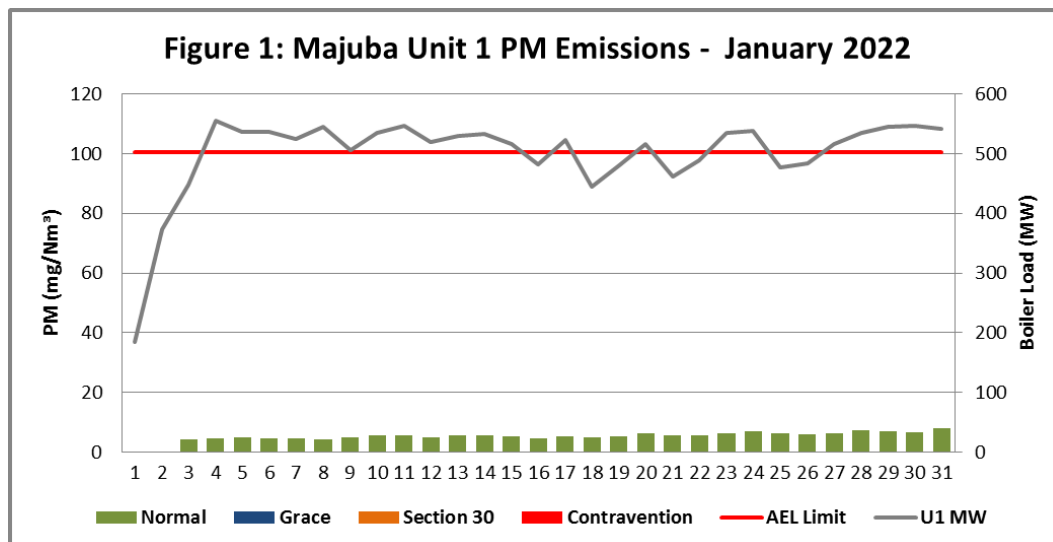


Figure 1. Particulate Matter emissions (daily averages) for the month of January 2022 against emission limit for Unit 1.

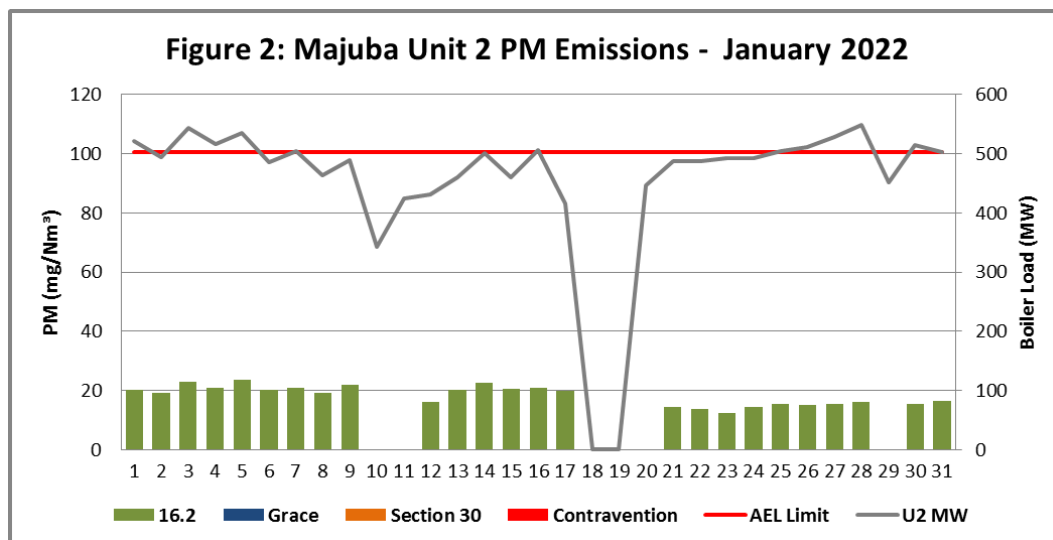


Figure 2. Particulate Matter emissions (daily averages) for the month of January 2022 against emission limit for Unit 2.

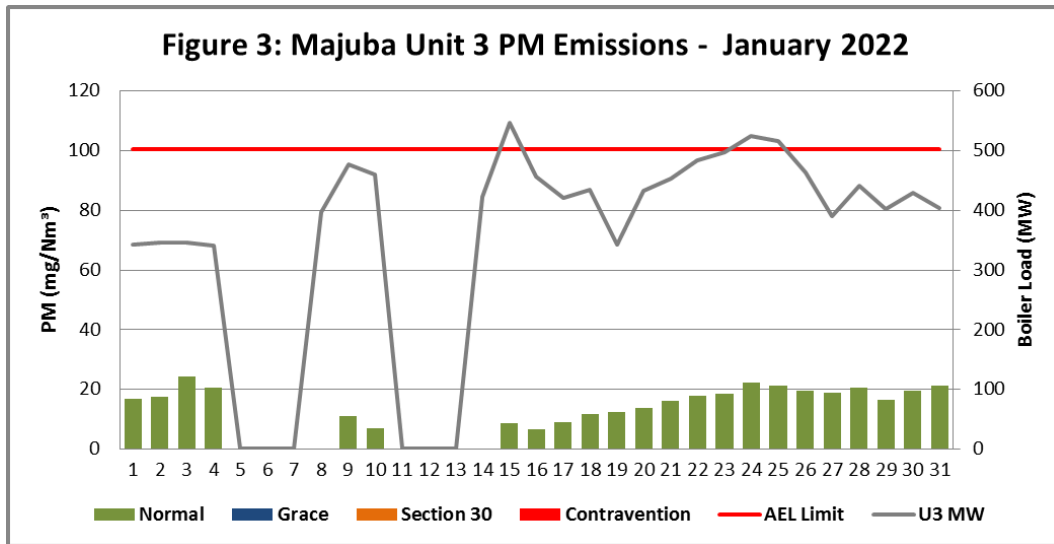


Figure 3. Particulate Matter emissions (daily averages) for the month of January 2022 against emission limit for Unit 3.

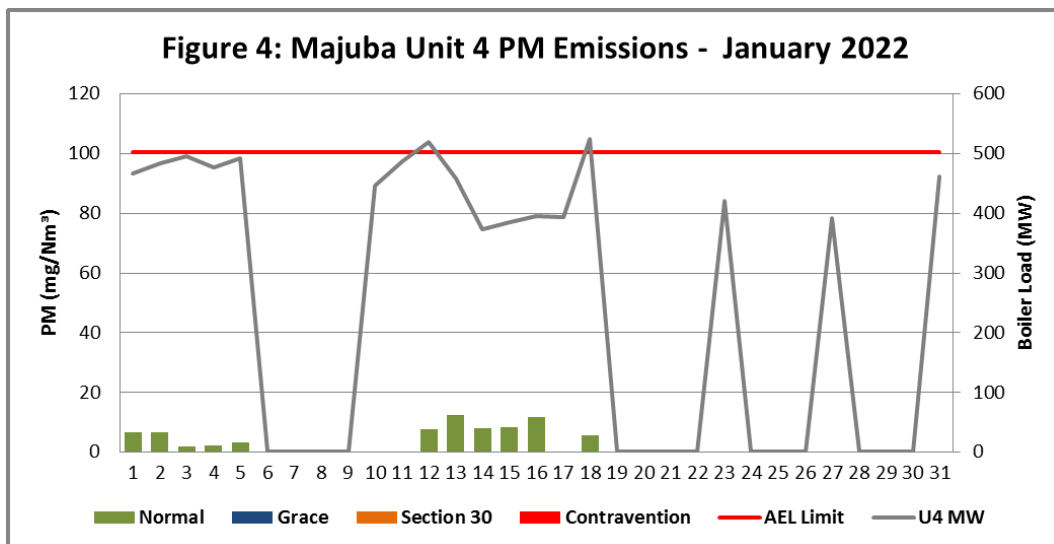


Figure 4. Particulate Matter emissions (daily averages) for the month of January 2022 against emission limit for Unit 4.

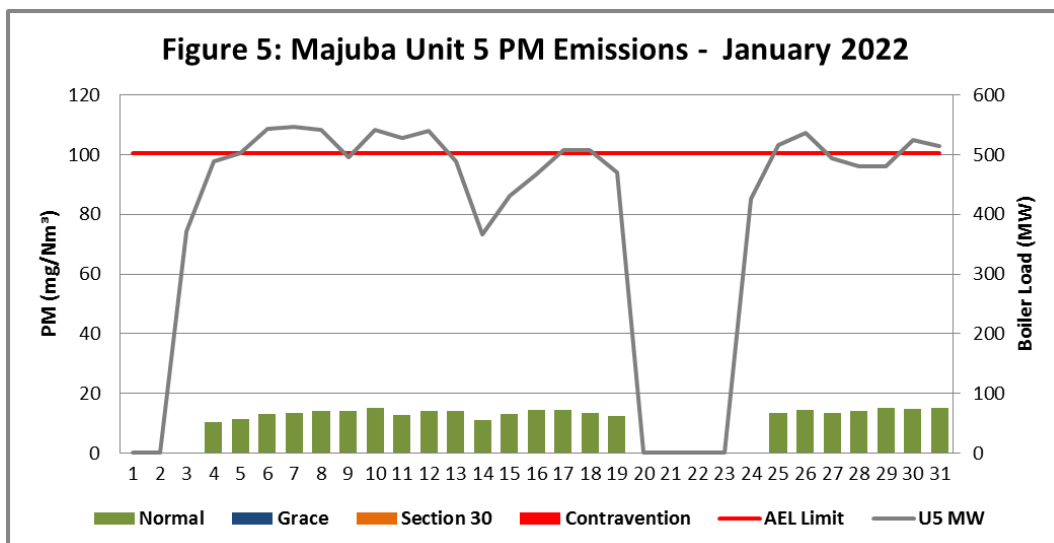


Figure 5. Particulate Matter emissions (daily averages) for the month of January 2022 against emission limit for Unit 5.

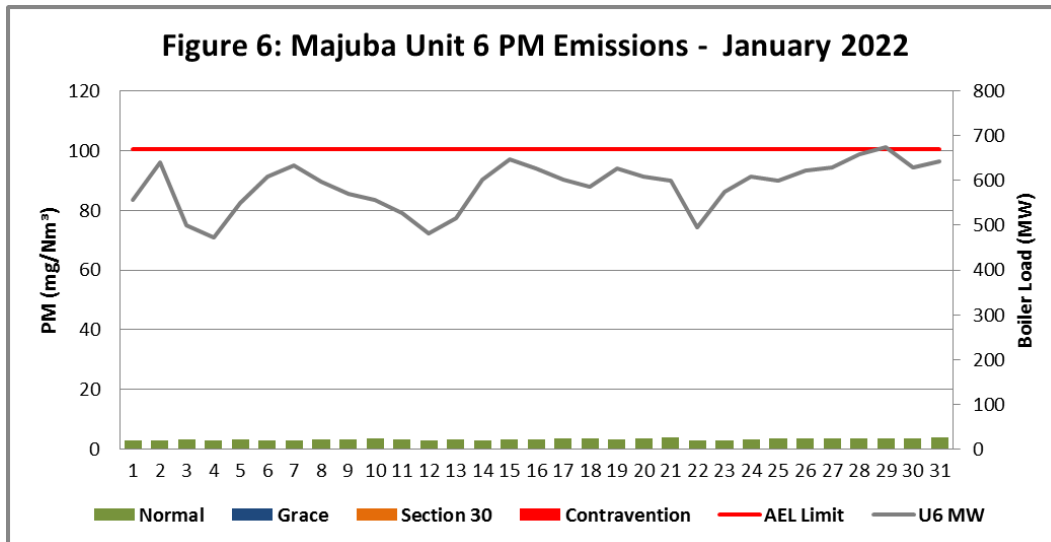


Figure 6. Particulate Matter emissions (daily averages) for the month of January 2022 against emission limit for Unit 6.

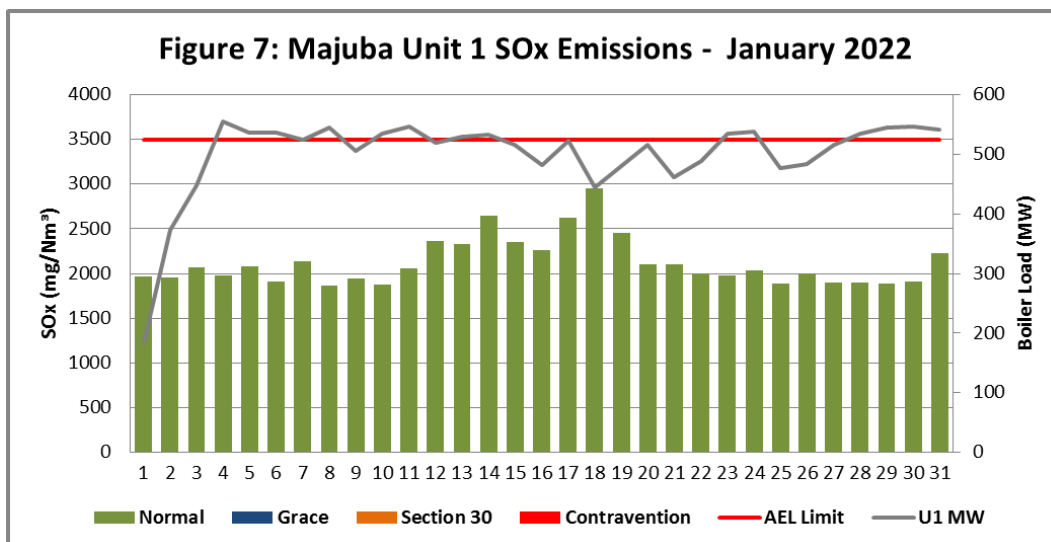


Figure 7. SOx emissions (daily averages) for the month of January 2022 against emission limit for Unit 1.

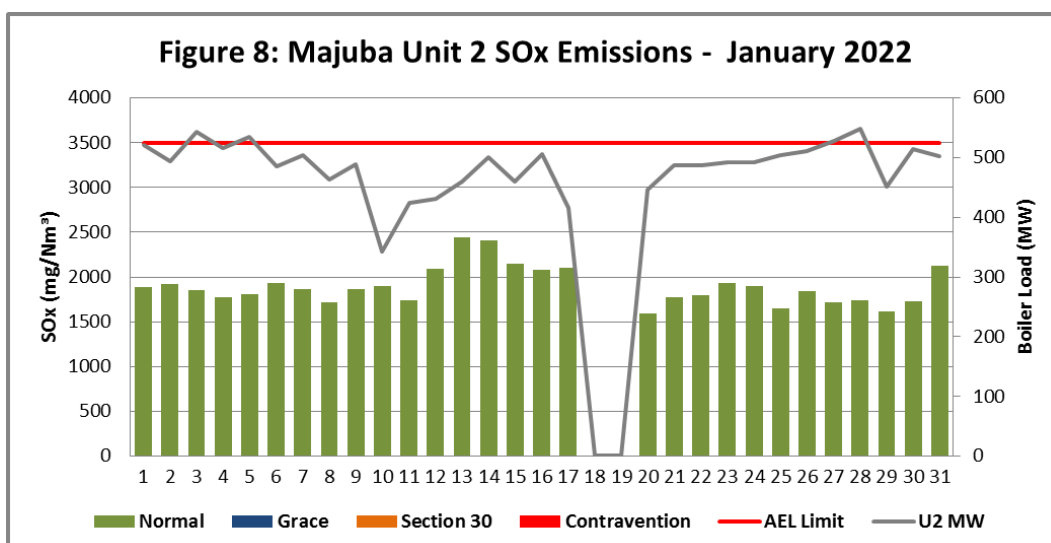


Figure 8. SOx emissions (daily averages) for the month of January 2022 against emission limit for Unit 2.

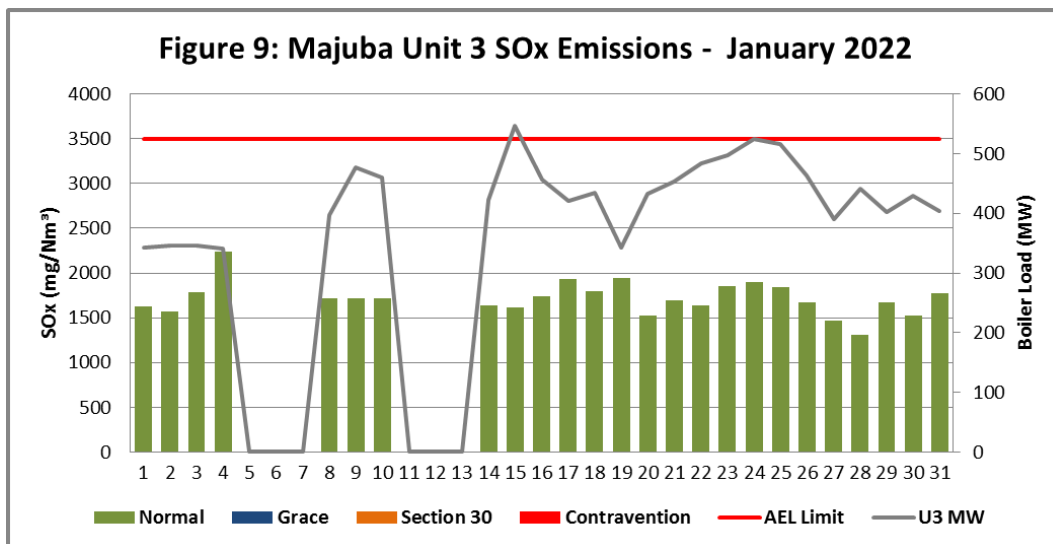


Figure 9. SOx emissions (daily averages) for the month of January 2022 against emission limit for Unit 3.

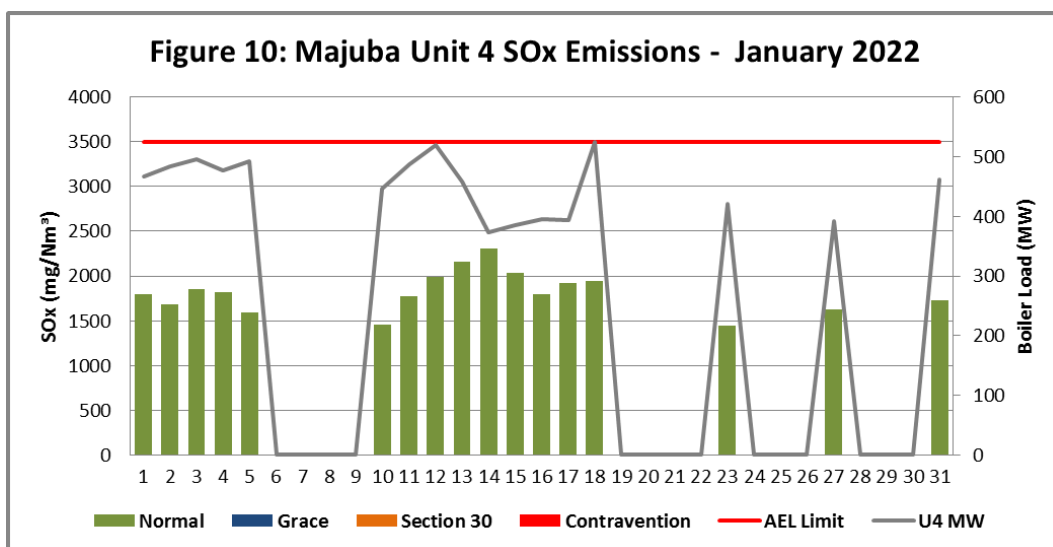


Figure 10. SOx emissions (daily averages) for the month of January 2022 against emission limit for Unit 4.

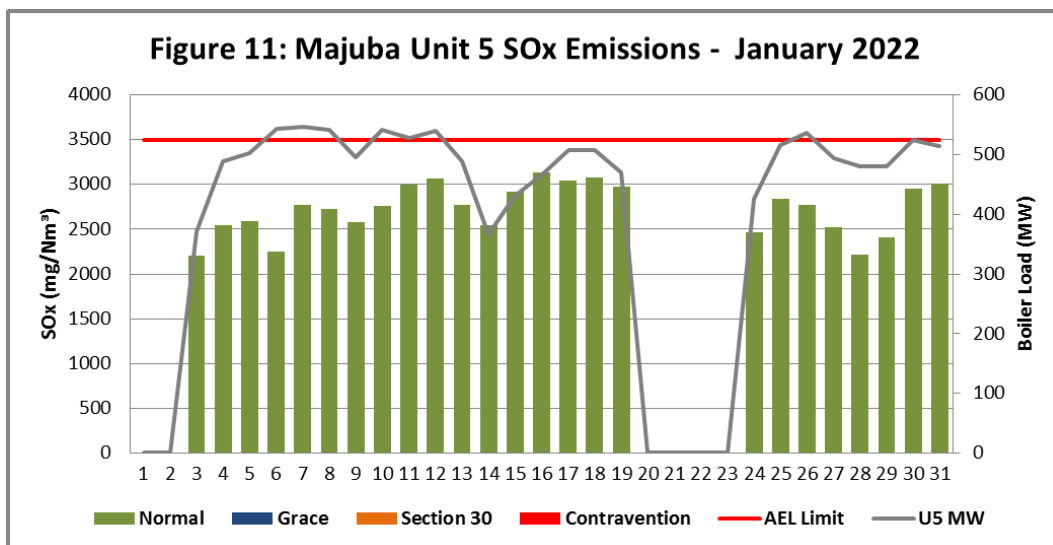


Figure 11. SOx emissions (daily averages) for the month of January 2022 against emission limit for Unit 5.

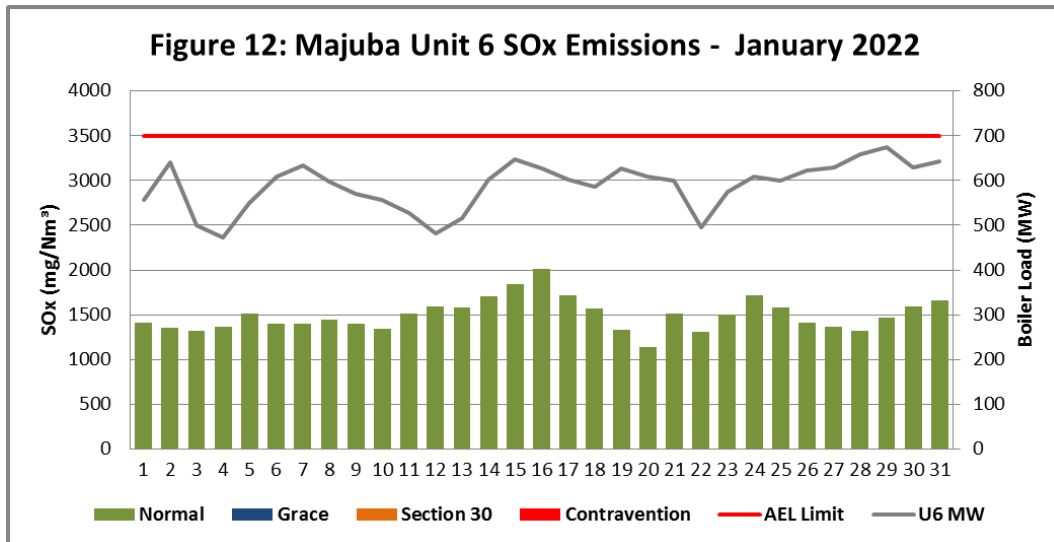


Figure 12. SOx emissions (daily averages) for the month of January 2022 against emission limit for Unit 6.

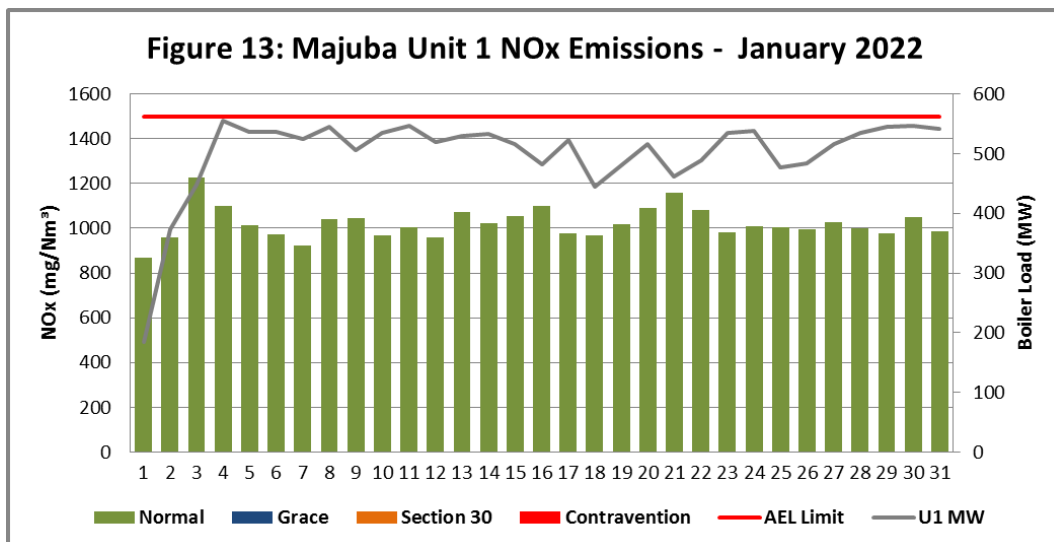


Figure 13. NOx emissions (daily averages) for the month of January 2022 against emission limit for Unit 1.

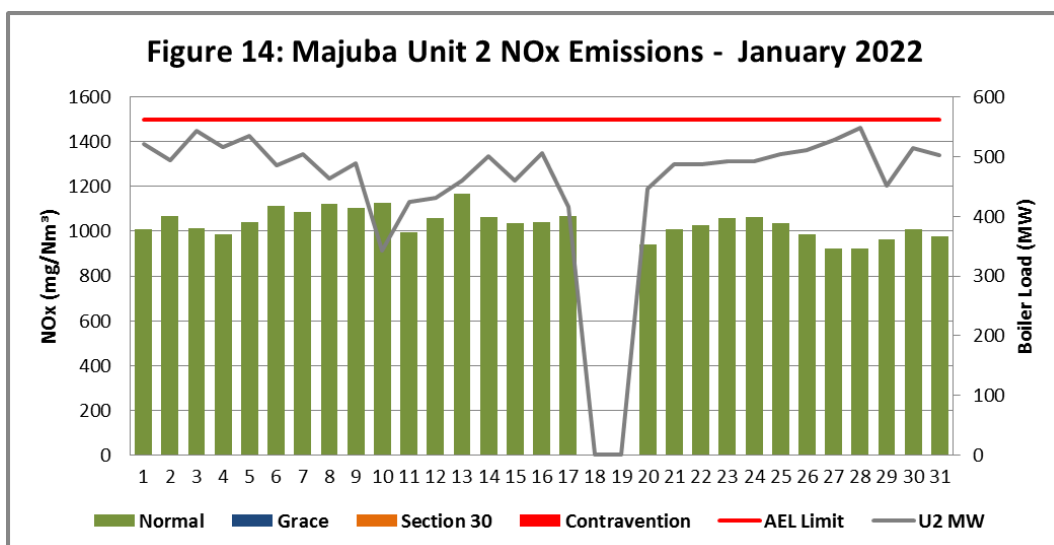


Figure 14. NOx emissions (daily averages) for the month of January 2022 against emission limit for Unit 2.

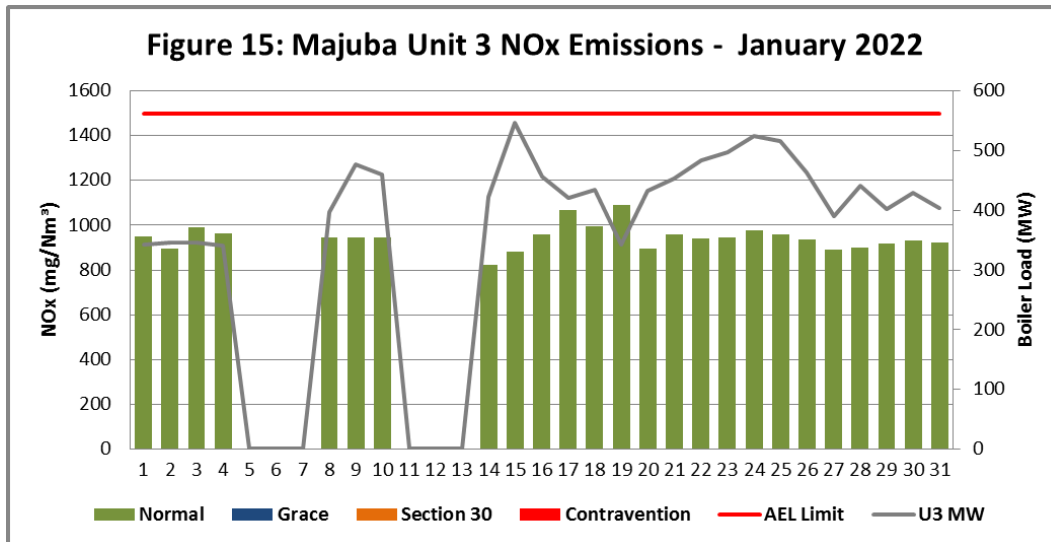


Figure 15. NOx emissions (daily averages) for the month of January 2022 against emission limit for Unit 3.

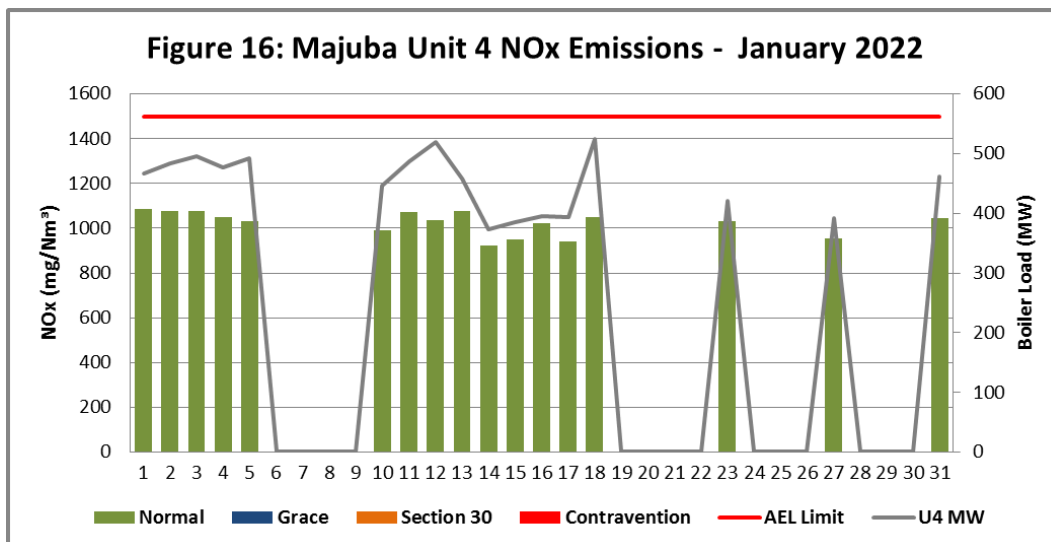


Figure 16. NOx emissions (daily averages) for the month of January 2022 against emission limit for Unit 4

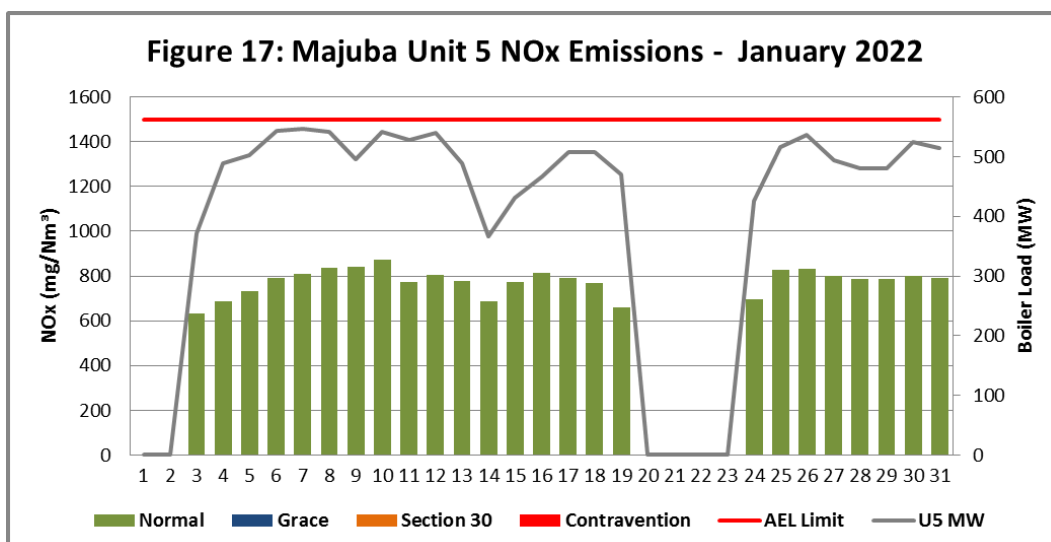


Figure 17. NOx emissions (daily averages) for the month of January 2022 against emission limit for Unit 5

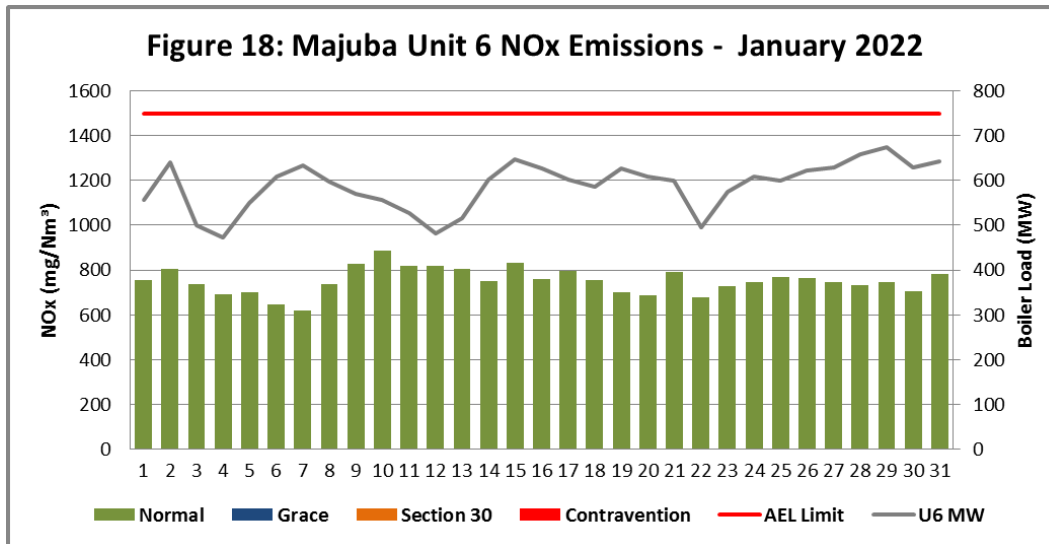


Figure 18. NOx emissions (daily averages) for the month January 2022 against emission limit for Unit 6

Table 4: Monthly tonnages for the month of January 2022

Unit	PM (tons)	SO ₂ (tons)	NO _x (tons)
1	10.0	3 999	1 936
2	24.1	2 899	1 577
3	18.6	2 118	1 176
4	2.6	1 487	834
5	21.0	4 686	1 340
6	8.0	3 662	1 838
Sum	84.4	18 850	8 700

Table 5: Average monthly concentrations (mg/Nm³) for the month of January 2022

Unit	PM (Mg/Nm ³)	SO ₂ (Mg/Nm ³)	NO ₂ (Mg/Nm ³)
1	5.6	2 120.5	1 020.5
2	18.4	1 895.6	1 034.4
3	16.2	1 715.2	945.2
4	6.7	1 817.7	1 023.6
5	13.5	2 723.6	774.5
6	3.3	1 496.5	752.0

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	31	0	0	0	0
Unit 2	29	0	0	0	0
Unit 3	25	0	0	0	0
Unit 4	17	0	0	0	0
Unit 5	25	0	0	0	0
Unit 6	31	0	0	0	0

Table 7: MONITOR RELIABILITY (%)

Associated Unit/Stack	PM	SO ₂	NO	CO ₂
Unit 1	100.0	100.0	96.3	96.3
Unit 2	100.0	100.0	100.0	99.8
Unit 3	100.0	83.2	83.5	99.7
Unit 4	85.2	97.3	98.2	98.2
Unit 5	100.0	100.0	100.0	99.7
Unit 6	100.0	100.0	100.0	100.0

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-Jan		9.9	7.7	9.6		11.4	14.7	10.4	12.8	10.9		8.4	14.7	20.4	20.4	20.5		19.8
02-Jan	8.2	9.5	8.0	10.0		12.0	12.0	11.3	12.5	10.7		8.4	20.1	20.8	20.5	20.7		20.5
03-Jan	8.7	10.1	9.0	10.5	9.7	10.8	12.3	10.4	11.6	10.0	9.6	8.4	21.0	20.5	20.6	20.5	19.3	19.1
04-Jan	10.1	10.0	8.6	10.4	10.1	10.5	10.3	10.6	12.1	10.1	10.4	8.3	20.4	20.6	20.7	20.6	20.5	18.8
05-Jan	9.9	10.2		11.1	10.3	11.1	10.2	10.6		9.6	10.4	8.4	20.0	20.8		20.7	20.8	19.5
06-Jan	9.8	9.7			11.2	11.7	10.8	11.2			9.7	8.4	20.7	20.9			21.0	20.2
07-Jan	10.0	9.8			11.0	11.9	10.4	10.9			10.3	8.4	20.4	20.7			21.3	20.3
08-Jan	10.2	9.5	9.7		11.2	11.9	10.2	11.5	10.6		10.3	8.4	20.4	20.9	20.4		21.5	20.3
09-Jan	9.6	9.7	10.5		10.9	11.4	11.1	11.1	9.8		10.3	8.4	20.7	20.8	20.4		21.2	19.8
10-Jan	9.8	8.2	10.3	10.4	11.7	11.4	11.0	12.5	9.8	9.5	10.3	8.4	20.8	20.7	20.1	20.0	22.0	19.8
11-Jan	10.2	9.2		10.8	11.3	11.0	10.3	10.6		9.4	9.6	8.4	20.5	19.9		20.2	20.9	19.4
12-Jan	9.9	9.1		11.1	11.8	10.3	10.2	11.4		9.3	10.1	8.4	20.1	20.5		20.3	21.9	18.7
13-Jan	9.8	9.3		10.2	11.0	10.9	11.3	11.9		10.0	10.3	8.4	21.1	21.2		20.2	21.3	19.2
14-Jan	9.9	10.0	10.2	9.1	9.9	11.5	11.0	10.7	10.5	11.5	10.3	8.4	20.9	20.6	20.7	20.6	20.2	19.9
15-Jan	10.1	9.6	11.5	9.4	10.7	11.9	10.6	11.2	9.0	10.8	10.3	8.4	20.6	20.8	20.5	20.2	21.0	20.3
16-Jan	9.7	10.1	10.3	9.6	11.1	11.9	10.9	10.5	10.0	11.3	10.3	8.5	20.7	20.6	20.3	20.9	21.5	20.4
17-Jan	9.8	9.9	9.3	9.7	11.1	11.8	11.1	10.8	11.1	10.1	10.4	8.2	20.9	20.7	20.4	19.8	21.4	20.0
18-Jan	9.2		10.1	11.0	10.9	11.5	11.8		10.4	9.5	10.4	7.9	20.9		20.4	20.5	21.3	19.4
19-Jan	9.5		8.6		10.1	11.7	10.9		11.7		10.6	7.7	20.3		20.3		20.7	19.4
20-Jan	9.6	9.4	9.7			11.6	11.5	9.9	10.5			7.8	21.1	19.3	20.2			19.4
21-Jan	9.1	9.7	9.6			11.6	12.0	10.7	10.7			7.8	21.1	20.4	20.3			19.4
22-Jan	9.6	9.7	10.2			10.8	11.2	10.8	10.0			8.8	20.8	20.4	20.2			19.5
23-Jan	10.0	9.5	11.1	9.1		11.5	10.2	10.9	9.2	10.7		7.8	20.2	20.5	20.2	19.8		19.4
24-Jan	10.0	9.7	11.3		10.1	11.9	10.6	11.0	9.0		10.2	7.6	20.6	20.7	20.3		20.3	19.4
25-Jan	9.6	10.0	11.2		11.4	11.6	11.1	10.8	9.0		10.3	7.8	20.6	20.7	20.2		21.6	19.4
26-Jan	9.7	10.1	10.5		11.8	11.8	10.9	10.5	9.7		10.3	7.6	20.7	20.6	20.3		22.2	19.4
27-Jan	10.1	10.4	9.4	9.9	11.4	11.9	10.8	10.0	10.9	10.0	10.3	7.5	20.8	20.4	20.3	19.9	21.7	19.4
28-Jan	10.3	10.5	10.4		10.8	12.1	10.3	9.8	9.8		10.3	7.3	20.6	20.3	20.2		21.1	19.4
29-Jan	10.5	9.4	10.0		10.7	12.2	9.6	10.0	10.0		10.3	7.2	20.1	19.4	20.0		21.0	19.4
30-Jan	10.1	10.1	10.4		11.8	11.9	10.4	10.4	9.7		10.3	7.6	20.5	20.5	20.1		22.1	19.5
31-Jan	10.0	10.1	9.5	10.4	11.4	11.7	10.2	10.3	10.7	9.6	10.3	7.7	20.1	20.4	20.2	20.0	21.7	19.5
Totals	9.8	9.7	9.9	10.1	10.9	11.5	11.0	10.8	10.4	10.2	10.2	8.1	20.7	20.5	20.3	20.3	21.2	19.6

Calculation: CO₂% + O₂% = 19.5-21.5%

Table 8: CO₂ and O₂ deviations of the Month of January 2022

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

Emergency Generation

Table 9: Emergency Generation for the month of January 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 all the days of the month. Two fabric filter bags were replaced this month.

UNIT 2

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

UNIT 3

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

UNIT 4

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

UNIT 5

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

UNIT 6

The unit base loaded for all the days of the month. Six fabric filter bags were replaced this month.

Complaints Register

Table 10: Complaints for the month of January 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 was received during the month of January 2022				

General

Correlation curves for Units 3, 4, 5, and 6 expired. Test have been completed for Unit 6, however the report is outstanding. Tests for Units 4 & 5 were started on 03 February 2022. Unit 3 correlation tests have not started due to the Unit running with fuel oil support.

Fuel oil consumption for the month of January 2022 exceeded the AEL limit of 6000/tons. An action plant to address the fuel oil consumption issues was submitted to GSDM on 31 January 2022.

Yours sincerely

Report compiled by:



Faith Kagoda
ENVIRONMENTAL MANAGER: (MAJUBA)

Date 11/02/2022

Report verified by:



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

Date 11/02/2022

Report approved by:



Sinothi Buthelezi
ENGINEERING MANAGER (A): (MAJUBA)

11/02/2022

Date