Eskom

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MAJUBA POWER STATION'S MONTHLY EMISSIONS REPORT FOR THE MONTH OF MAY 2024

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 May 2024. Verified emissions of particulates are included. SO_2 and NOx (as NO_2) emissions are included for all units. Greenhouse gasses are excluded as per the agreement reached between Eskom and the Department of Forestry, Fisheries and the Environmental 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 May 2024

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption/ Rate in Month of May 2024
	Coal	Tons/month	1 800 000	1 136 577
	Fuel Oil	Tons/month	6 000	3 174.4
Production Rates	**Product/ By-Product Name**	**Unit**	**Maximum Production Rate Permitted (Quantity)**	**Production Rate in Month of May 2024**
	Energy	*GWh	*3 058	1 928.01
	Ash	Tons/month	Not stated in the license	344 155.40

*Majuba AEL stipulates a maximum production capacity of 4110 MW. This equates to a production rate of 3058 GWh per month when converted, as indicated above. This is to align to the monthly production rates reported.

Abatement Technology

Table 2. Abatement Equipment Control Technology for the month of May 2024

Associated Unit	Technology Type	Actual Utilisation (%) for the month of May 2024	*Minimum Control Efficiency (%)
Unit 1	Fabric Filter Plant	100	99.98
Unit 2	Fabric Filter Plant	100	99.85
Unit 3	Fabric Filter Plant	100	99.97
Unit 4	Fabric Filter Plant	100	99.93
Unit 5	Fabric Filter Plant	100	99.88
Unit 6	Fabric Filter Plant	100	99.84

*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 May 2024

Characteristic	Stipulated Limit (Unit)	Monthly Average Content
Sulphur Content	*0.94%*	*0.76*
Ash Content	*30%*	*30.28*

Emissions Reporting

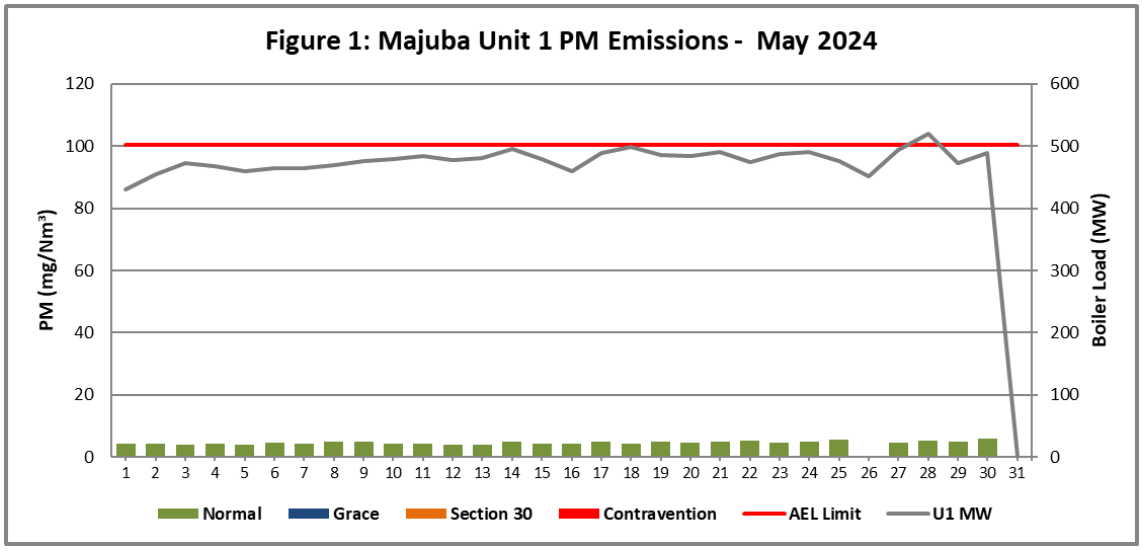


Figure 1. Particulate Matter emissions (daily averages) for the month of May 2024 against emission limit for Unit 1.

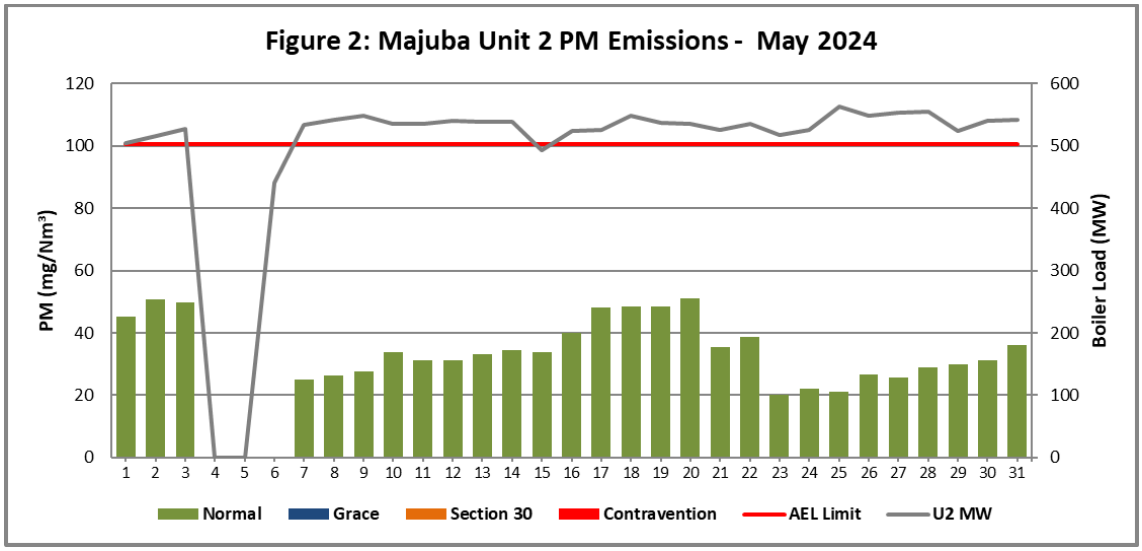


Figure 2. Particulate Matter emissions (daily averages) for the month of May 2024 against emission limit for Unit 2.

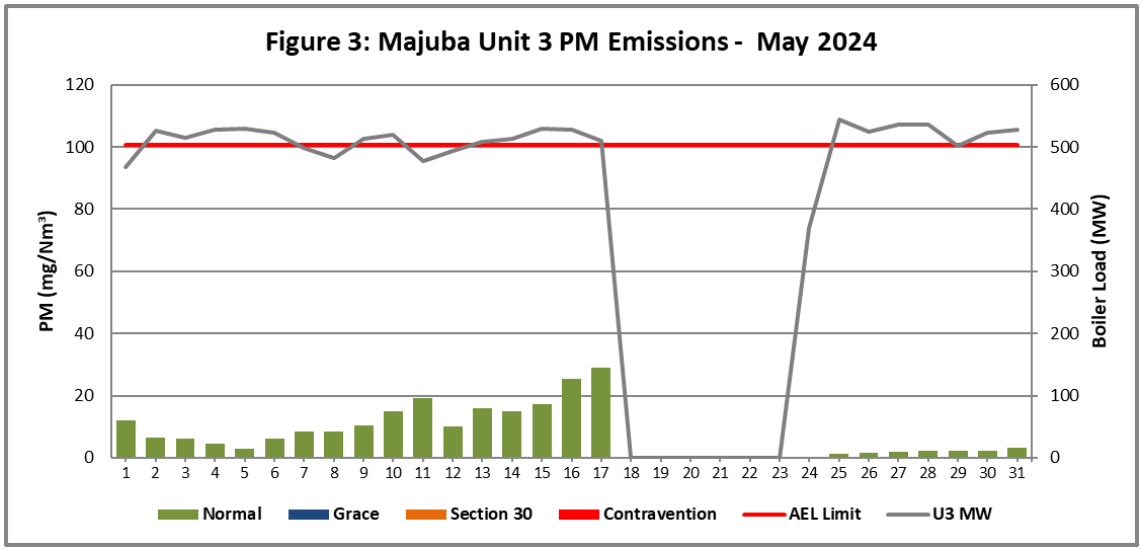


Figure 3. Particulate Matter emissions (daily averages) for the month of May 2024 against emission limit for Unit 3.

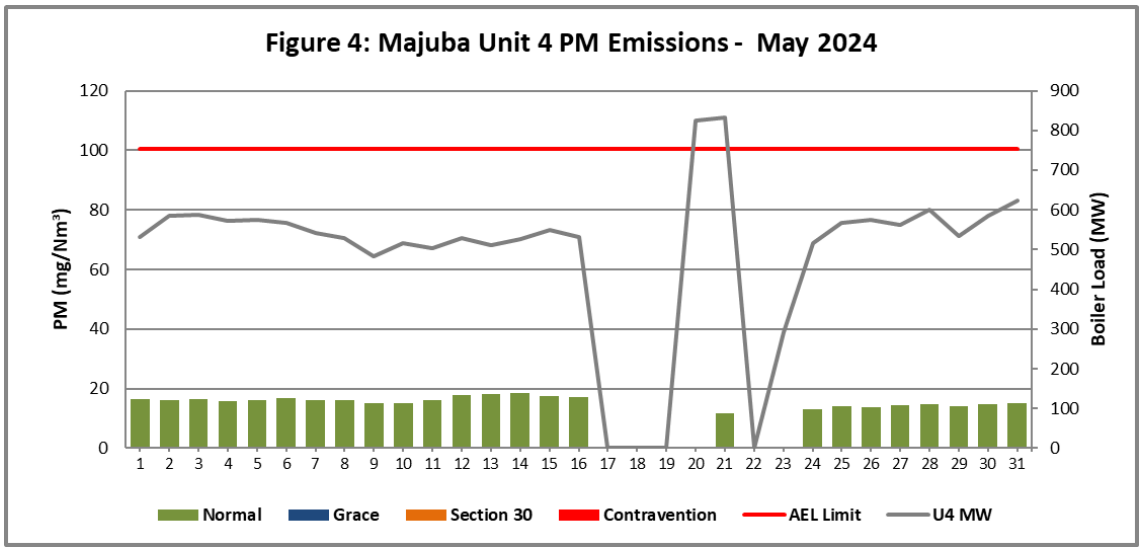


Figure 4. Particulate Matter emissions (daily averages) for the month of May 2024 against emission limit for Unit 4.

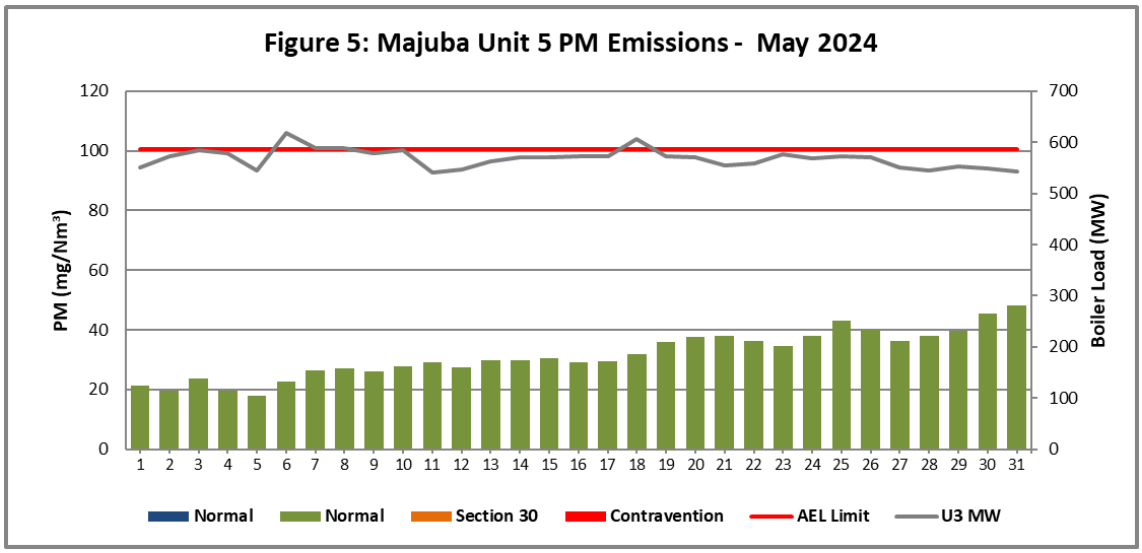


Figure 5. Particulate Matter emissions (daily averages) for the month of May 2024 against emission limit for Unit 5.

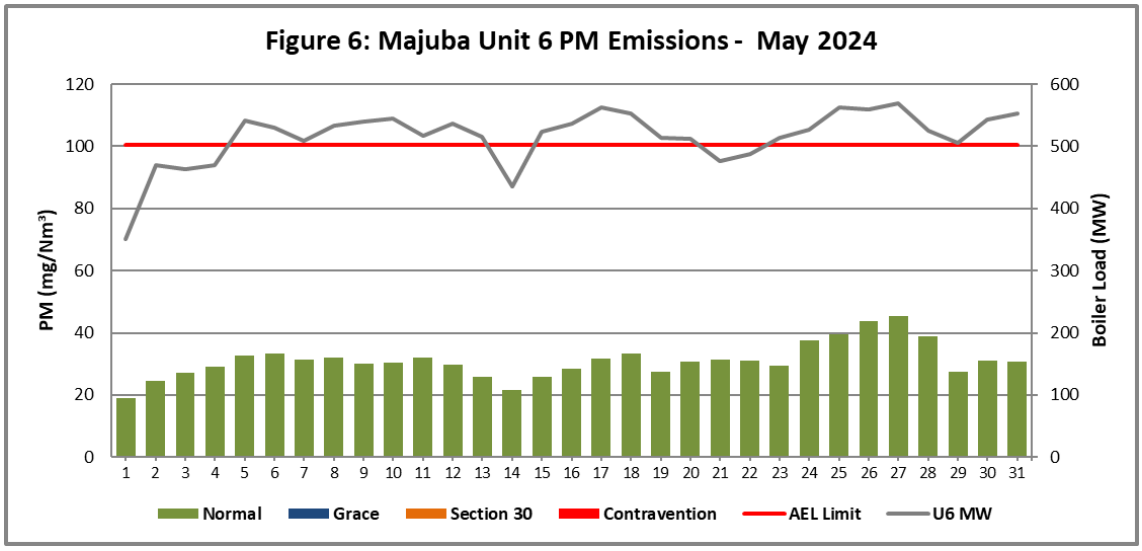


Figure 6. Particulate Matter emissions (daily averages) for the month of May 2024 against emission limit for Unit 6.

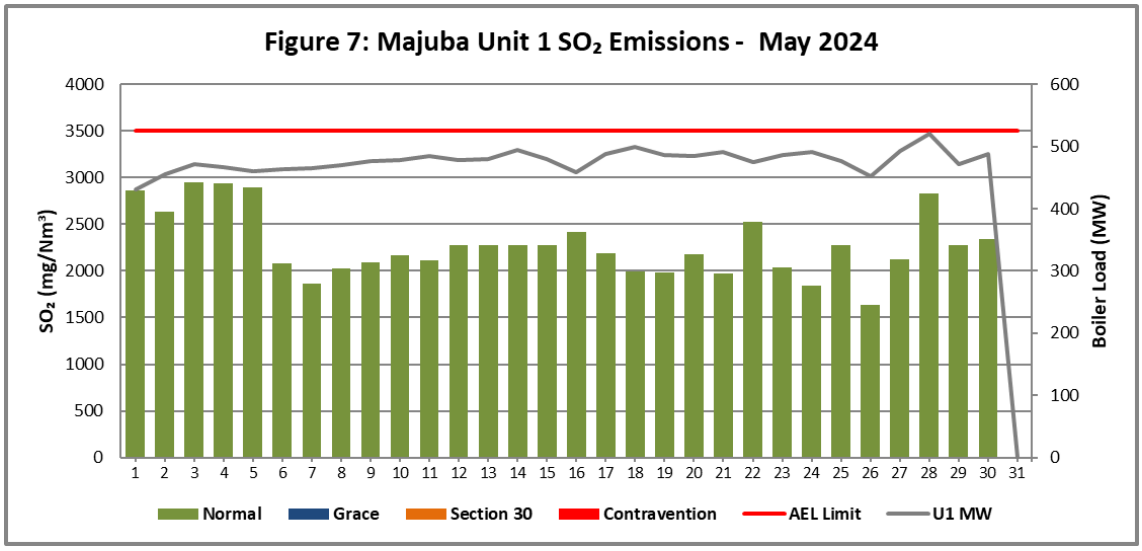


Figure 7. SO_2 emissions (daily averages) for the month of May 2024 against emission limit for Unit 1.

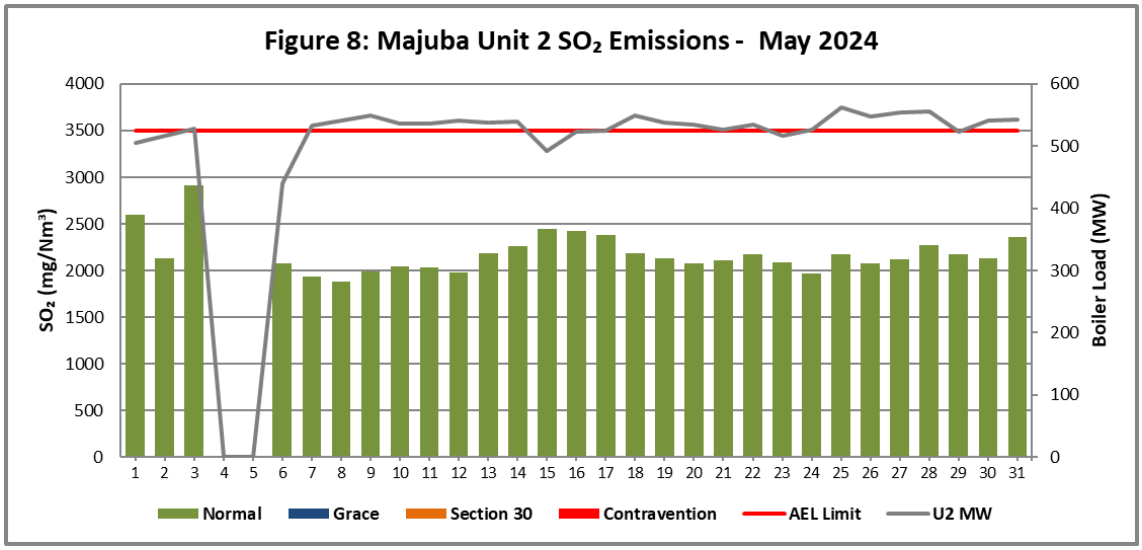


Figure 8. SO_2 emissions (daily averages) for the month of May 2024 against emission limit for Unit 2.

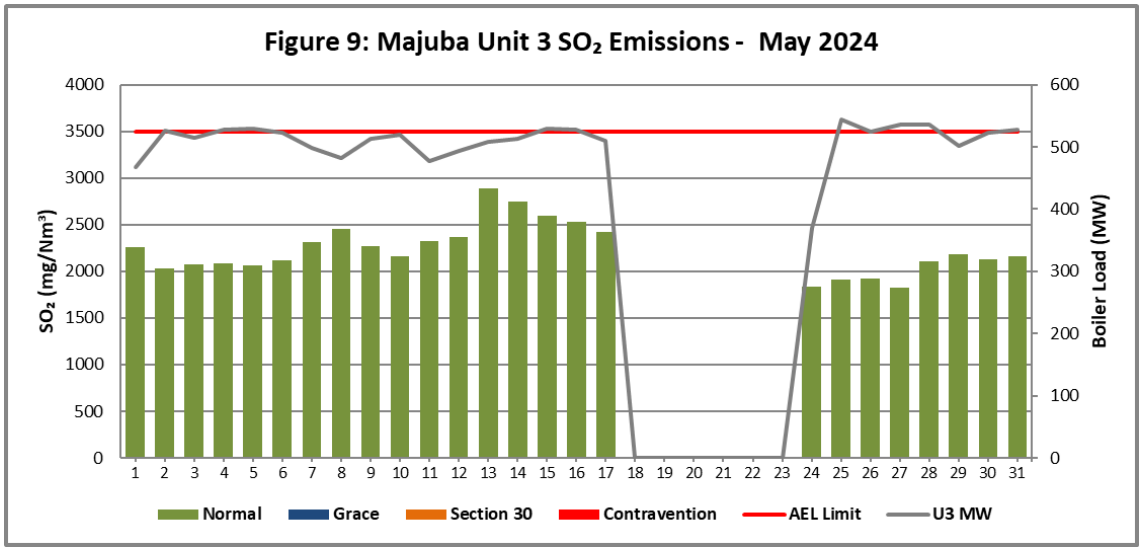


Figure 9. SO_2 emissions (daily averages) for the month of May 2024 against emission limit for Unit 3.

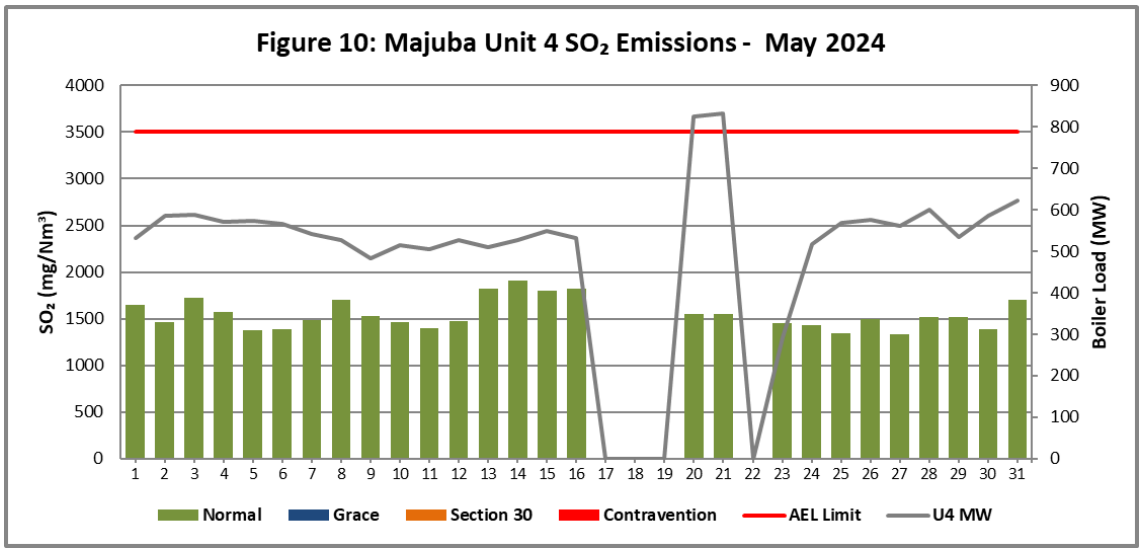


Figure 10. SO_2 emissions (daily averages) for the month of May 2024 against emission limit for Unit 4.

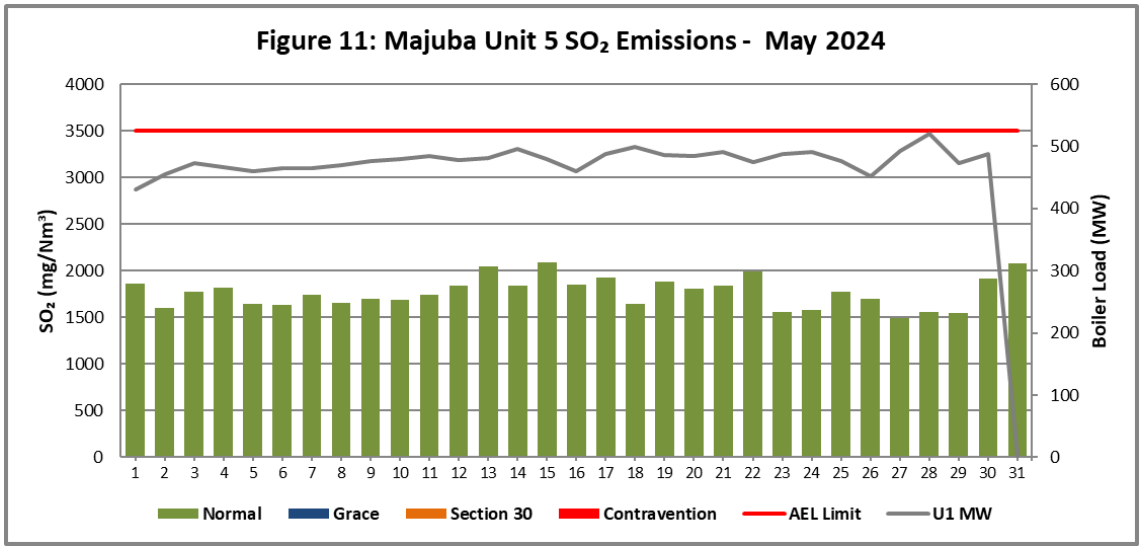


Figure 11. SO_2 emissions (daily averages) for the month of May 2024 against emission limit for Unit 5

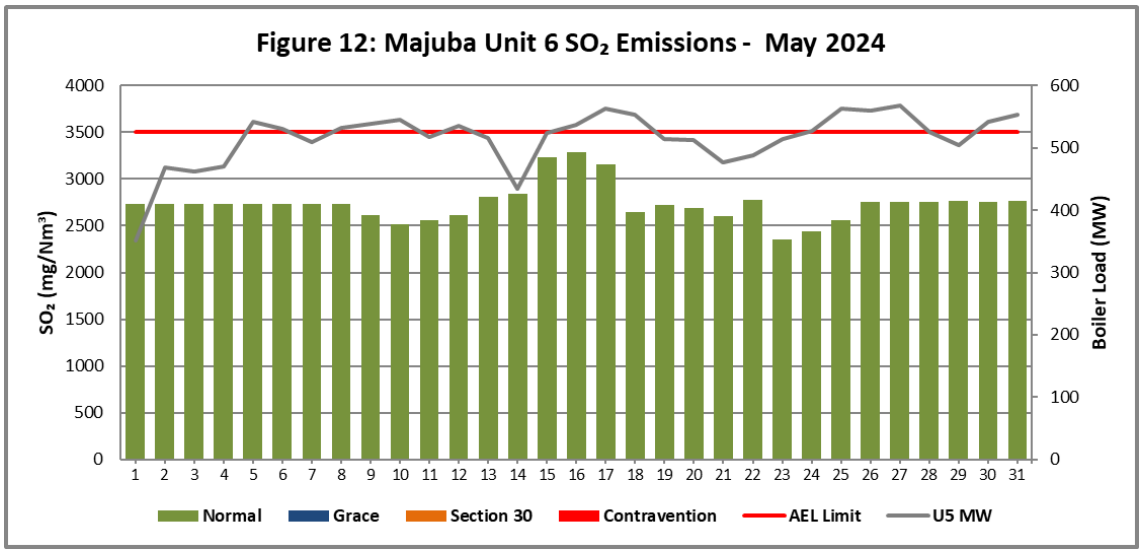


Figure 12. SO_2 emissions (daily averages) for the month of May 2024 against emission limit for Unit 6.

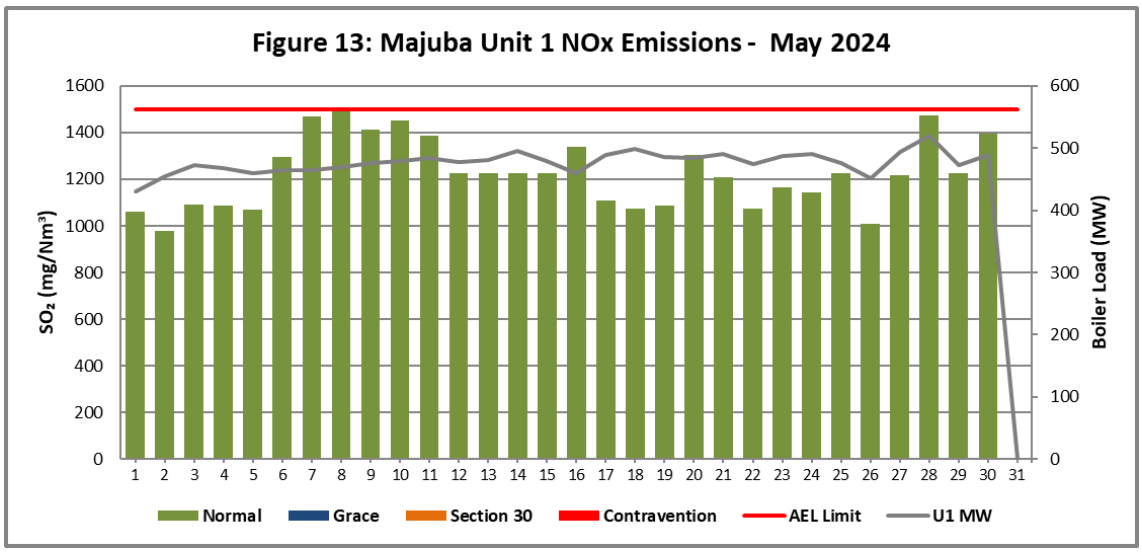


Figure 13. NOx emissions (daily averages) for the month of May 2024 against emission limit for Unit 1.

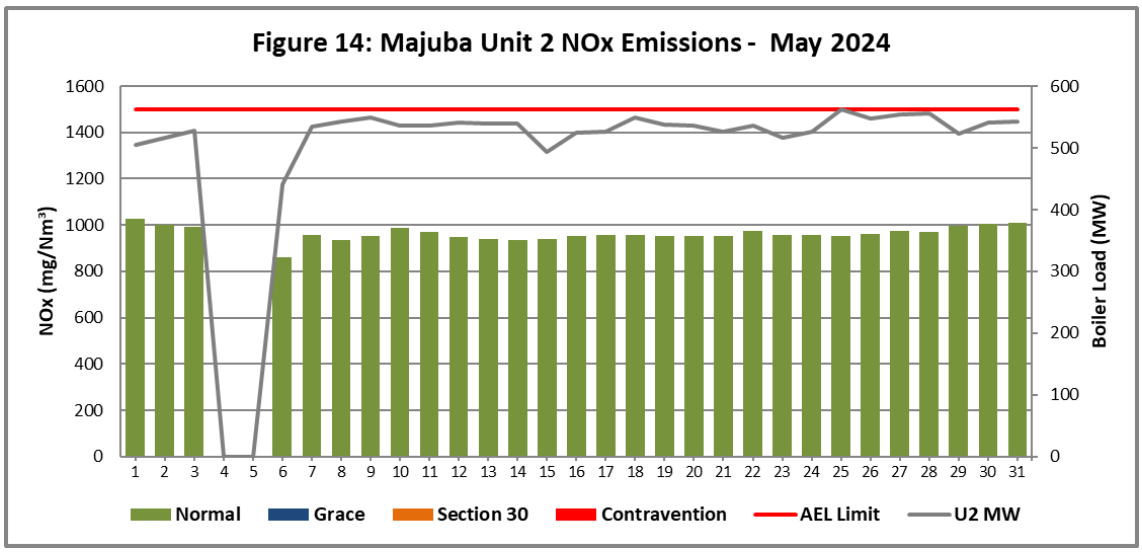


Figure 14. NOx emissions (daily averages) for the month of May 2024 against emission limit for Unit 2.

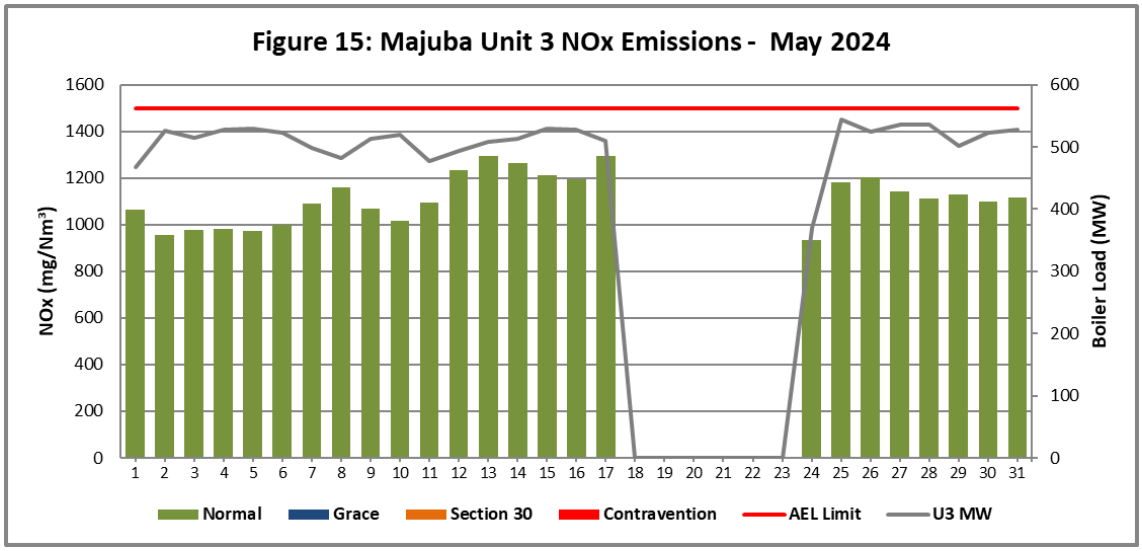


Figure 15. NOx emissions (daily averages) for the month of May 2024 against emission limit for Unit 3.

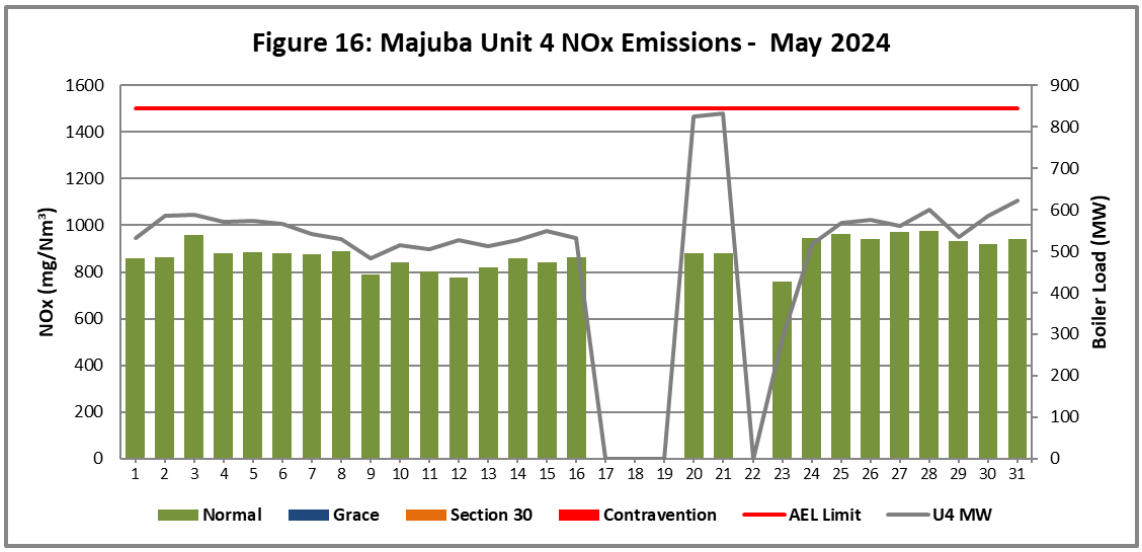


Figure 16. NOx emissions (daily averages) for the month of May 2024 against emission limit for Unit 4

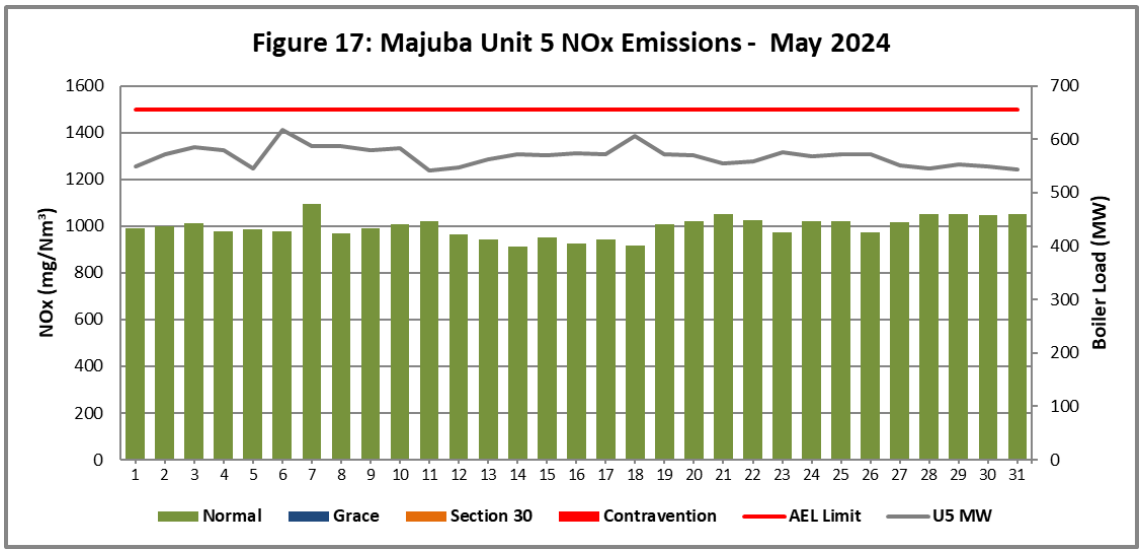


Figure 17. NOx emissions (daily averages) for the month of May 2024 against emission limit for Unit 5

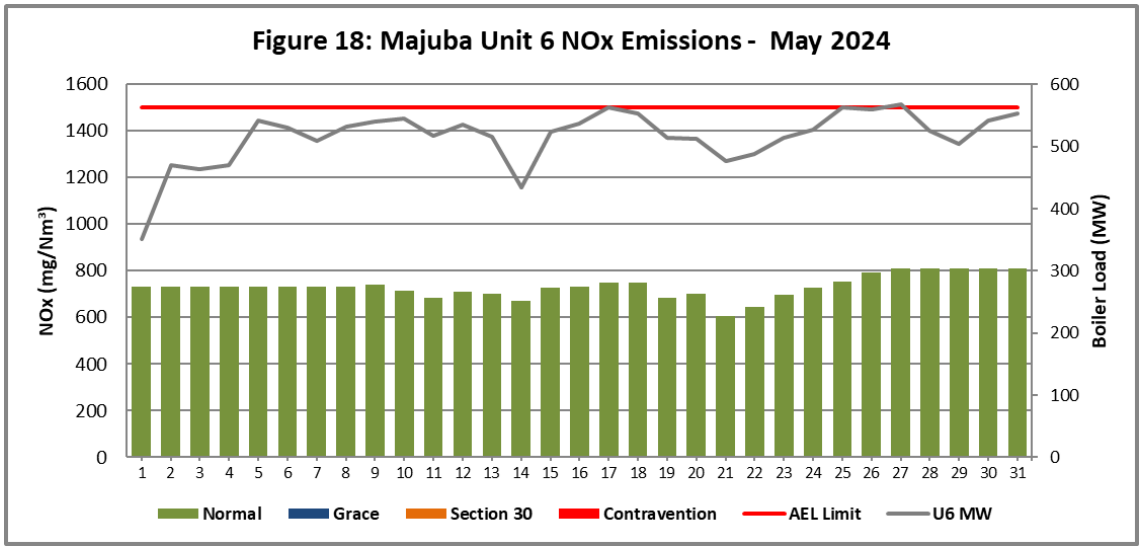


Figure 18. NOx emissions (daily averages) for the month May 2024 against emission limit for Unit 6

Table 4: Monthly tonnages for the month of May 2024

Unit	PM (tons)	SO_2 (tons)	NOx (tons)
Unit 1	7.9	4 031	2 160
Unit 2	79.7	5 154	2 282
Unit 3	15.6	3 902	1 945
Unit 4	30.2	3 415	1 959
Unit 5	76.8	4 377	2 465
Unit 6	86.2	7 811	2 090

Table 5: Average monthly concentrations (mg/Nm^3) for the month of May 2024

Unit	PM (Mg/Nm^3)	SO_2 (Mg/Nm^3)	NOx (Mg/Nm^3)
1	4.6	2 279.3	1 224.4
2	35.0	2 183.0	963.7
3	9.5	2 230.6	1 111.7
4	15.7	1 549.8	881.4
5	31.8	1 767.6	996.4
6	31.2	2 738.3	731.8

Table 6: Each unit and respective days operating in compliance to the AEL Emission Limits (SO_2, NOx, and PM)

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance
Unit 1	29	0	0	0	0
Unit 2	28	0	0	0	0
Unit 3	24	0	0	0	0
Unit 4	25	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_2	NOx	O_2
Unit 1	100.0	100.0	100.0	75.7
Unit 2	100.0	100.0	100.0	100.0
Unit 3	67.9	100.0	100.0	98.9
Unit 4	99.8	92.4	92.4	92.4
Unit 5	100.0	100.0	100.0	100.0
Unit 6	100.0	72.7	72.7	99.5

Table 8: CO_2 and O_2 deviations of the Month of May 2024

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

CO_2 and O_2 Relationship

2024/06/10	CO_2 (Actual Dry %)						Final O_2 CEMS Data (%)						SUM CO_2 + O_2 CEMS Data (%)					
Date	U1	U2	U3	U4	U5	U6	U1	U2	U3	U4	U5	U6	U1	U2	U3	U4	U5	U6
2024/05/01	8.9	10.7	8.9	9.2	10.2	10.0	11.9	10.0	11.9	10.5	9.9	9.1	20.8	20.7	20.9	19.7	20.0	19.1
2024/05/02	9.4	10.6	9.7	9.3	10.2	12.1	11.1	9.1	10.9	10.2	10.1	9.1	20.5	19.8	20.6	19.4	20.3	21.2
2024/05/03	9.6	10.6	9.5	9.3	10.2	12.0	12.1	9.7	11.1	10.8	9.9	9.1	21.7	20.4	20.7	20.1	20.1	21.1
2024/05/04	9.6		9.5	9.2	10.2	12.0	12.1		11.2	9.6	9.5	9.1	21.7		20.7	18.9	19.7	21.1
2024/05/05	9.4		9.6	9.3	10.2	12.5	11.9		11.1	9.8	9.9	9.1	21.3		20.8	19.0	20.0	21.6
2024/05/06	9.7	10.4	9.5	9.3	10.3	12.3	11.9	9.5	11.4	9.8	9.0	9.1	21.6	19.9	20.9	19.1	19.3	21.4
2024/05/07	9.5	10.5	8.9	9.3	10.2	11.9	12.3	9.0	12.1	10.4	9.7	9.1	21.9	19.5	21.1	19.7	19.9	21.0
2024/05/08	9.5	10.5	8.4	9.3	10.2	12.5	12.5	8.7	12.7	11.0	9.3	9.1	22.0	19.2	21.1	20.2	19.5	21.6
2024/05/09	9.8	10.6	8.9	9.1	10.2	12.2	12.2	8.8	12.0	10.8	9.5	9.1	22.0	19.4	20.8	19.8	19.7	21.3
2024/05/10	9.5	10.6	9.3	9.2	10.3	12.1	12.2	9.0	11.5	10.8	9.7	9.1	21.8	19.6	20.8	20.1	20.0	21.2
2024/05/11	9.8	10.7	8.9	9.3	10.2	11.9	11.9	9.0	12.2	10.4	10.1	9.1	21.6	19.7	21.1	19.7	20.3	21.0
2024/05/12	9.7	10.5	9.1	9.2	10.1	12.2	11.7	8.8	11.9	9.9	9.6	9.1	21.4	19.3	21.0	19.1	19.7	21.3
2024/05/13	9.7	10.5	9.1	9.1	10.1	12.0	11.7	8.7	11.8	10.4	9.5	9.1	21.4	19.2	20.9	19.5	19.6	21.1
2024/05/14	9.7	10.5	9.2	9.1	10.0	11.4	11.7	8.7	11.6	10.4	9.4	9.1	21.4	19.2	20.8	19.5	19.4	20.5
2024/05/15	9.7	10.4	9.5	9.1	10.1	12.4	11.7	9.3	11.3	10.0	9.4	9.1	21.4	19.8	20.8	19.1	19.5	21.5
2024/05/16	9.6	10.5	9.5	9.1	10.1	12.3	11.2	8.9	11.3	10.5	9.3	9.1	20.9	19.4	20.8	19.6	19.4	21.4
2024/05/17	10.0	10.6	9.2		10.2	12.5	10.8	8.8	11.5		9.4	9.1	20.8	19.4	20.7		19.6	21.6
2024/05/18	10.1	10.6			10.2	12.3	10.7	8.9			9.1	9.1	20.8	19.5			19.3	21.4
2024/05/19	9.8	10.5			10.1	11.7	10.7	9.2			9.9	9.1	20.5	19.7			20.1	20.8
2024/05/20	9.6	10.5		7.0	10.1	11.7	12.4	9.4		10.3	9.9	9.1	21.9	19.9		17.2	20.1	20.8
2024/05/21	9.6	10.5		6.9	10.1	11.0	11.5	9.4		10.3	10.3	9.1	21.2	19.9		17.2	20.4	20.1
2024/05/22	9.1	10.6			10.1	11.2	11.3	9.3			10.0	9.1	20.4	19.8			20.1	20.3
2024/05/23	9.6	10.4		8.5	10.1	11.9	11.0	9.4		12.4	9.3	9.1	20.6	19.8		21.0	19.4	21.0
2024/05/24	9.6	10.5	8.2	9.1	10.1	12.1	10.9	9.2	11.7	10.5	9.6	9.1	20.6	19.7	19.9	19.7	19.7	21.2
2024/05/25	9.7	10.5	9.8	9.1	10.1	12.5	11.7	8.9	10.4	10.0	9.6	9.1	21.4	19.3	20.2	19.1	19.7	21.6
2024/05/26	9.3	10.6	9.5	9.2	10.1	12.6	10.0	8.9	11.1	10.0	9.3	9.1	19.3	19.4	20.6	19.2	19.3	21.7
2024/05/27	9.8	10.5	9.7	9.1	10.0	12.8	12.2	9.1	10.9	10.0	9.7	9.1	22.1	19.6	20.6	19.1	19.7	21.9
2024/05/28	10.1	10.5	9.7	9.2	10.0	12.3	13.3	8.9	10.9	9.6	10.0	9.1	23.4	19.5	20.7	18.8	20.0	21.4
2024/05/29	9.7	10.5	9.5	9.1	10.1	12.2	11.7	9.2	11.2	10.0	9.8	9.1	21.4	19.7	20.7	19.1	19.9	21.3
2024/05/30	9.7	10.6	9.7	9.2	10.1	12.1	12.8	9.1	10.9	9.3	9.9	9.1	22.5	19.7	20.6	18.5	20.0	21.2
2024/05/31		10.6	9.7	9.3	10.1	12.2		8.8	11.0	9.3	9.9	9.1		19.4	20.7	18.7	20.0	21.3

Calculation: CO_2% + O_2% = 19.5-21.5%

Emergency Generation
Table 9: Emergency Generation for the month of May 2024

	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 one day. Thirty-four fabric filter bags were replaced during the month.

UNIT 2

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

UNIT 3

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

UNIT 5

The unit base loaded for all of the days of the month. No fabric filter bag was replaced during the month.

UNIT 6

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

Complaints Register

Table 10: Complaints for the month of May 2024

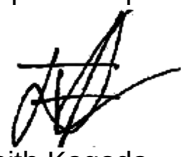
Source Code/ Name	Root Cause Analysis	Calculation of Impacts/ emissions associated with the incident	Dispersion modelling of pollutants where applicable	Measures implemented to prevent reoccurrence	Date by which measure will be implemented
	No complaints were received during the month of May 2024.				

General

The ash content for the month of May was slightly above the limit at 30.28%. The Station will be monitoring it closely. The Unit 3 PM and Unit 1 O_2 monitors reliability was below 80%. The Original Equipment Manufacturer has been called to site for the servicing and calibration of these monitors. Unit 6 NOx and SO_2 monitors were reading 0 at the beginning of the month when the unit came back from an outage, hence the reliability of 72.7%. The monitors were reset and are now at 100% reliability.

Yours sincerely

Report compiled by:



Faith Kagoda Date 10/06/2024
ENVIRONMENTAL MANAGER: (MAJUBA)

Report verified by:

Lindani Madonsela Date 11/06/2024
BOILER ENGINEERING MANAGER: (MAJUBA)

Report approved by:

Johan Swanepoel Date 2024/06/11
ENGINEERING MANAGER: (MAJUBA)