

Mr Dan Hlanyane
 Director Planning and Services
 Gert Sibande District Municipality
 PO BOX 3016
 ERMELO
 2350

Date: 14 March 2019

Enquiries:

Dear Mr. Hlanyane

MAJUBA POWER STATION'S REVISED MONTHLY EMISSIONS REPORT FOR THE MONTH OF NOVEMBER 2018

This serves as the monthly report required in terms of Majuba Power Station's Atmospheric Emission License (MPS/0014/2014/F01) under section 7 routine reporting and record keeping. The emissions are for the month of November 2018. Verified emissions of particulates are included. SO₂ and NO_x (as NO₂) emissions are included for all units.

Raw Materials and Products

Table 1. Quantity of Raw Materials and Products used/produced for the month of November 2018

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption/ Rate in Month of November 2018
	Coal	Tons/month	1 800 000	1231941
	Fuel Oil	Tons/month	6000	2 282.40
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity - MW)	Production Rate in Month of November 2018
	Energy	GWh	4110	2355.37
	Ash	Tons/month	Not stated in the license	364654.5

Abatement Technology

Table 2. Abatement Equipment Control Technology for the month of November 2018

Associated Unit	Technology Type	*Minimum Control Efficiency (%)	Actual Utilisation (%) for the month of November 2018
Unit 1	Fabric Filter Plant	100	99.89%
Unit 2	Fabric Filter Plant	100	99.87%
Unit 3	Fabric Filter Plant	100	99.63%
Unit 4	Fabric Filter Plant	100	99.75%
Unit 5	Fabric Filter Plant	100	99.95%
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

Generation Division (Operating Unit Coal 2)

Majuba Power Station

Between Amersfoort and Volksrust

Private Bag x9001 Volksrust 2470 SA

Tel +27 17 799 2100 Fax +27 17 799 3615 www.eskom.co.za

Eskom Holdings SOC Ltd Reg No 2002/015527/30

Energy Source Characteristics

Table 3. Energy Source Material Characteristics for the month of November 2018

Characteristic	Stipulated Range (Unit)	Monthly Average Content
CV Content	<i>Not stipulated</i>	
Sulphur Content	0.6 to >0.94%	0.82
Ash Content	28 to >30%	29.6%

Emissions Reporting

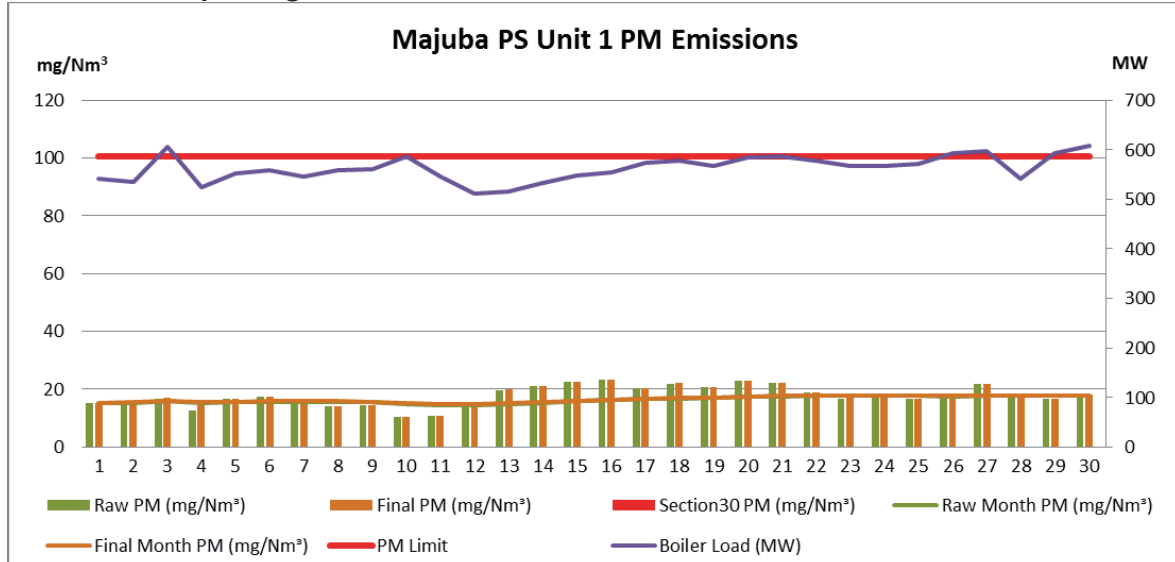


Figure 1. Particulate Matter emissions (daily averages) for the month of November 2018 against emission limit for Unit 1

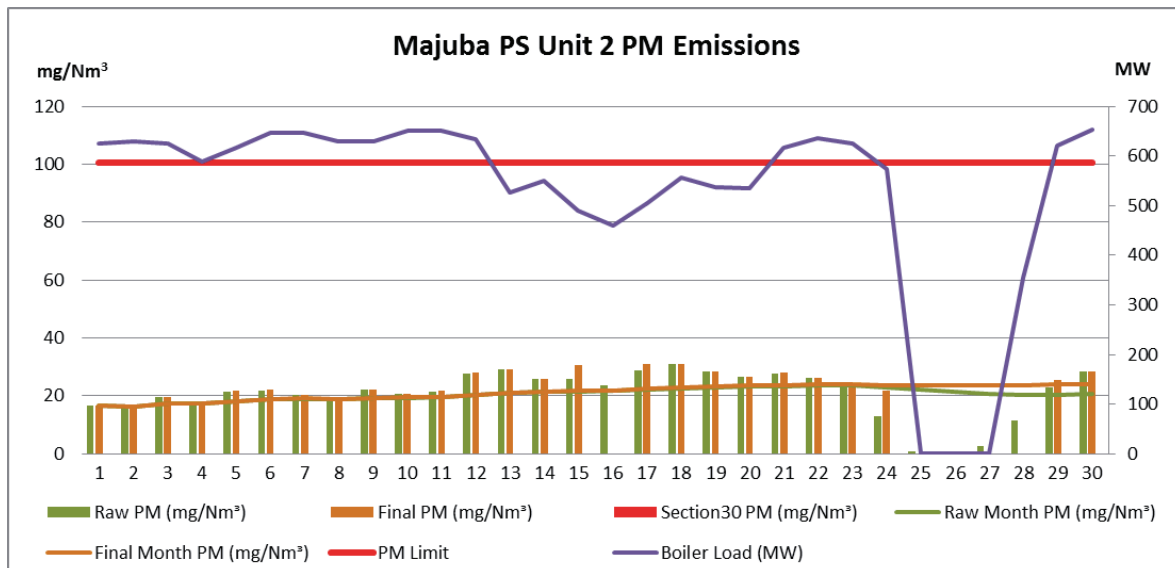


Figure 2. Particulate Matter emissions (daily averages) for the month of November 2018 against emission limit for Unit 2

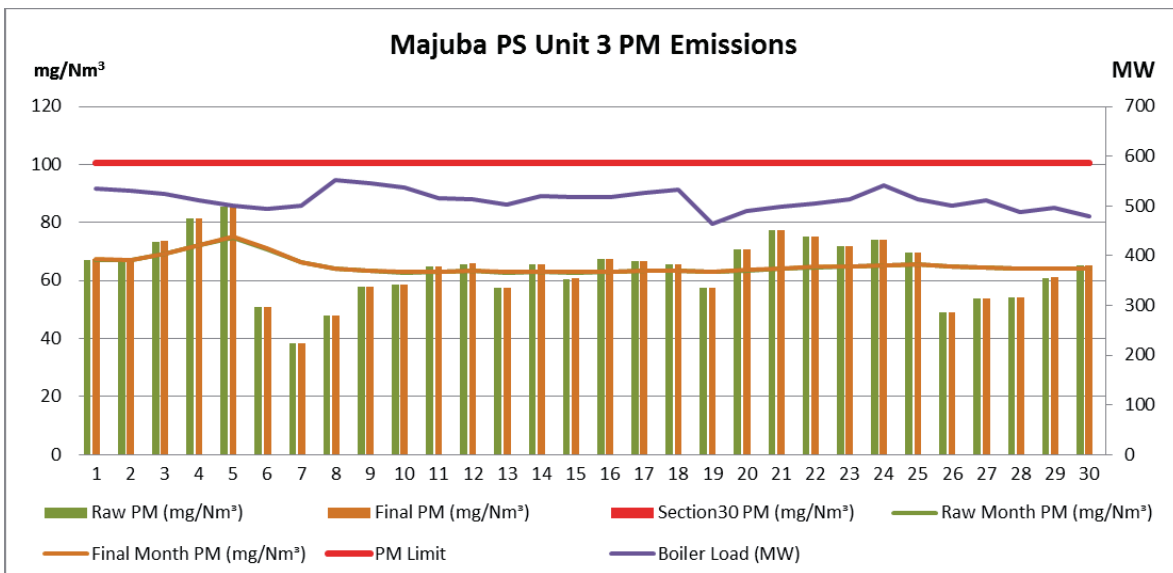


Figure 3. Particulate Matter emissions (daily averages) for the month of November 2018 against emission limit for Unit 3

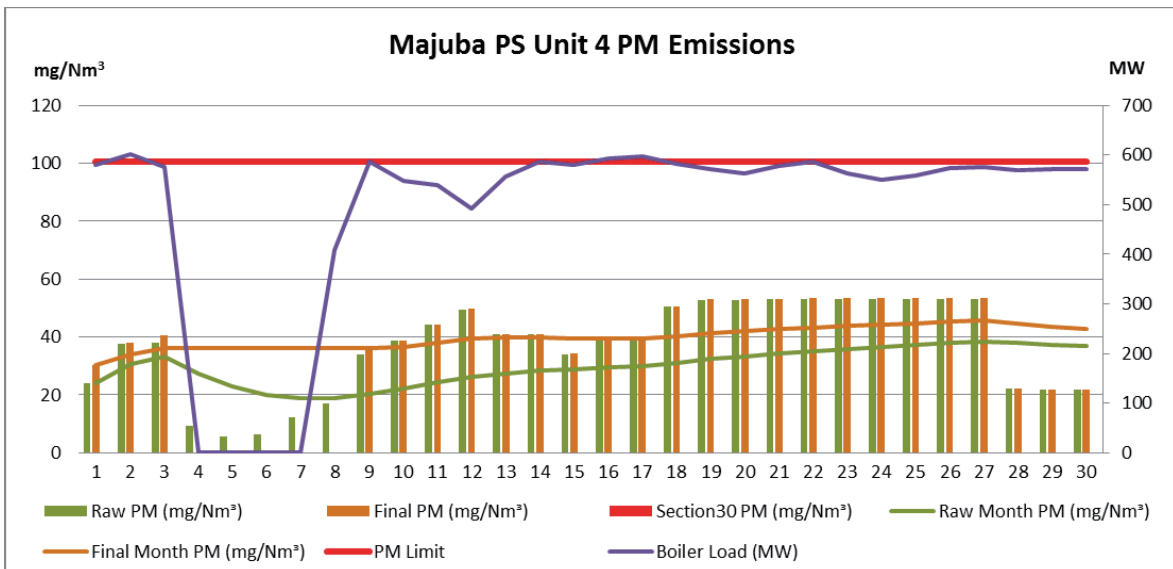


Figure 4. Particulate Matter emissions (daily averages) for the month of November 2018 against emission limit for Unit 4

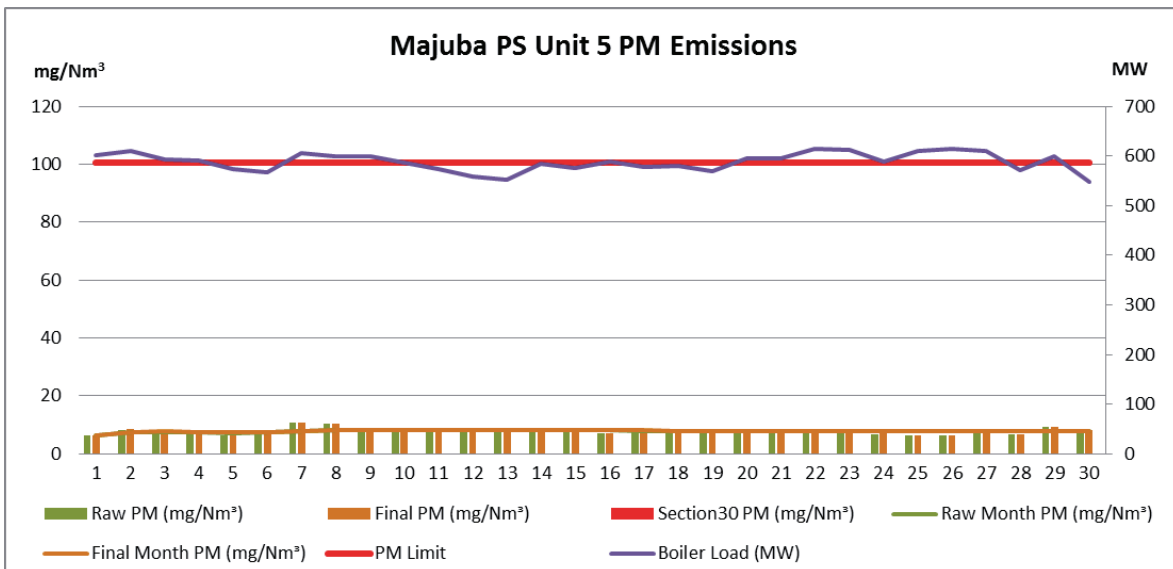


Figure 5. Particulate Matter emissions (daily averages) for the month of November 2018 against emission limit for Unit 5

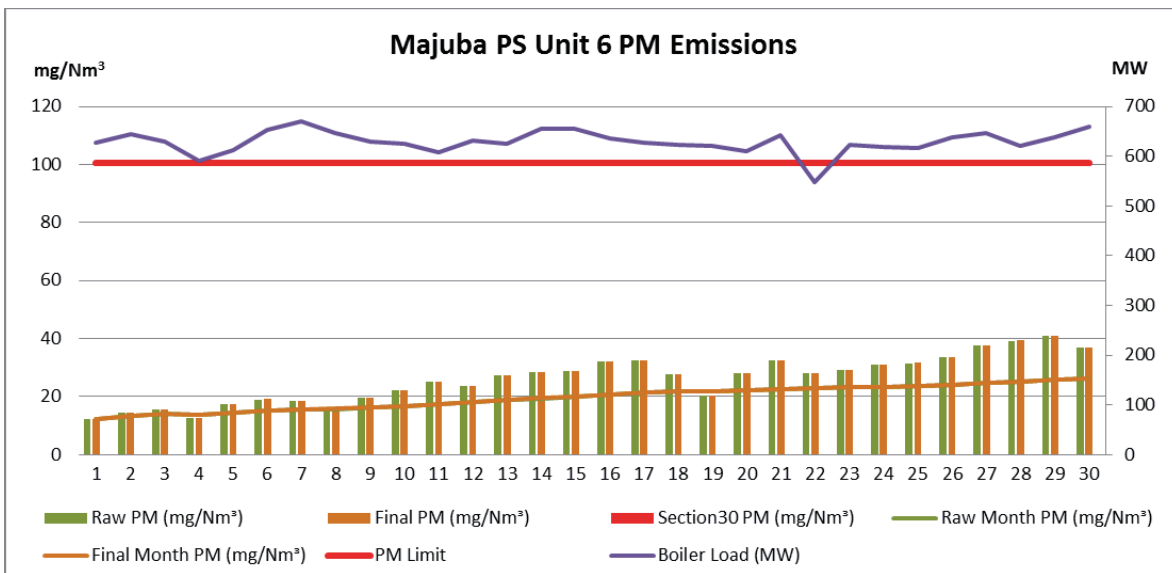


Figure 6. Particulate Matter emissions (daily averages) for the month of November 2018 against emission limit for Unit 6

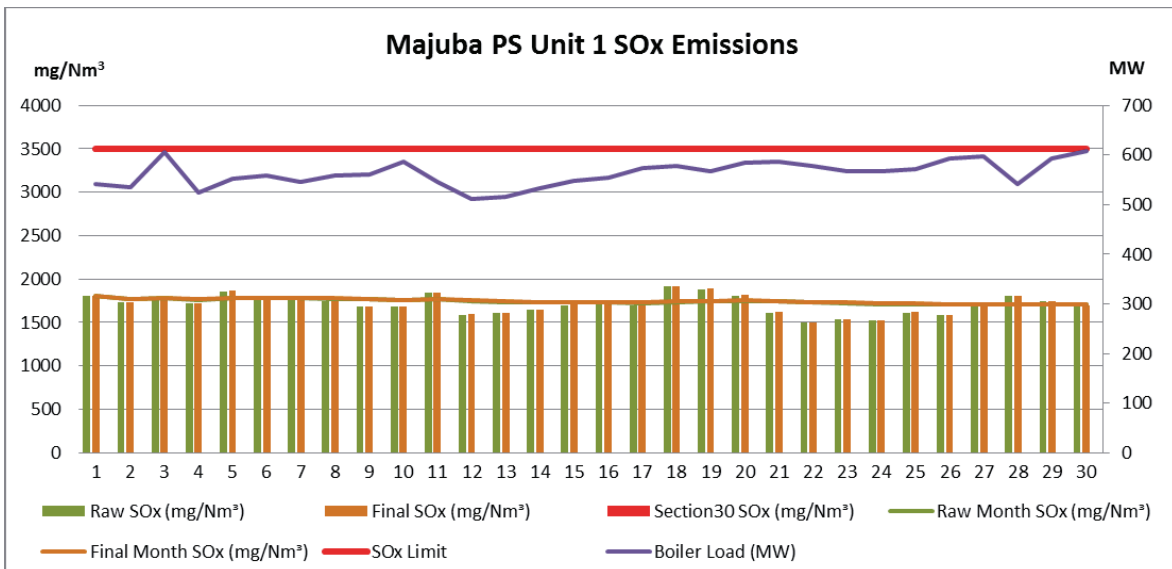


Figure 7. SOx emissions (daily averages) for the month of November 2018 against emission limit for Unit 1

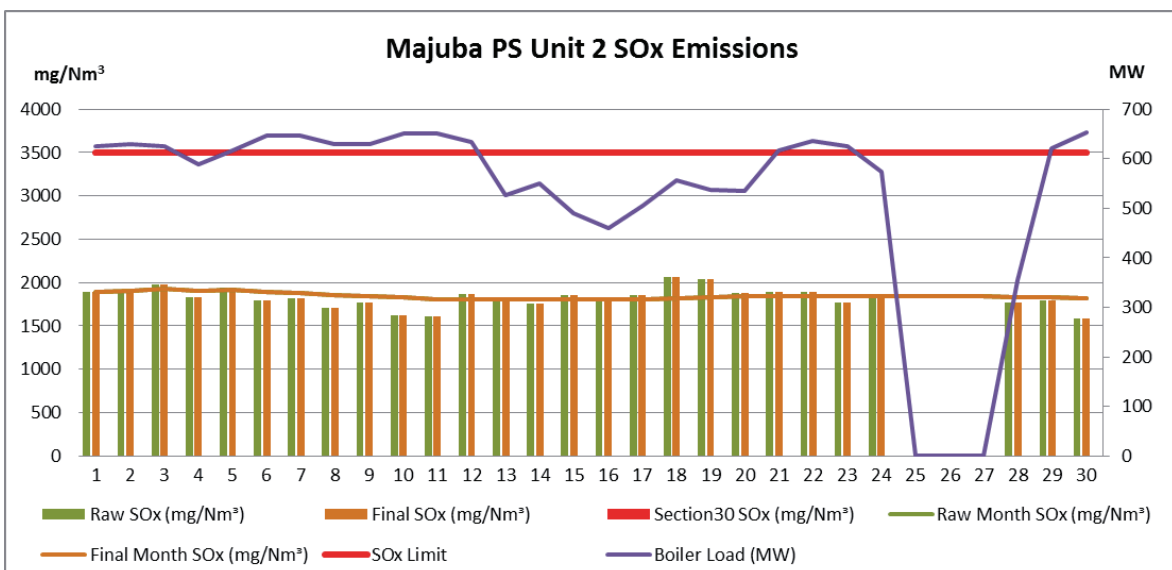


Figure 8. Sox emissions (daily averages) for the month of November 2018 against emission limit for Unit 2

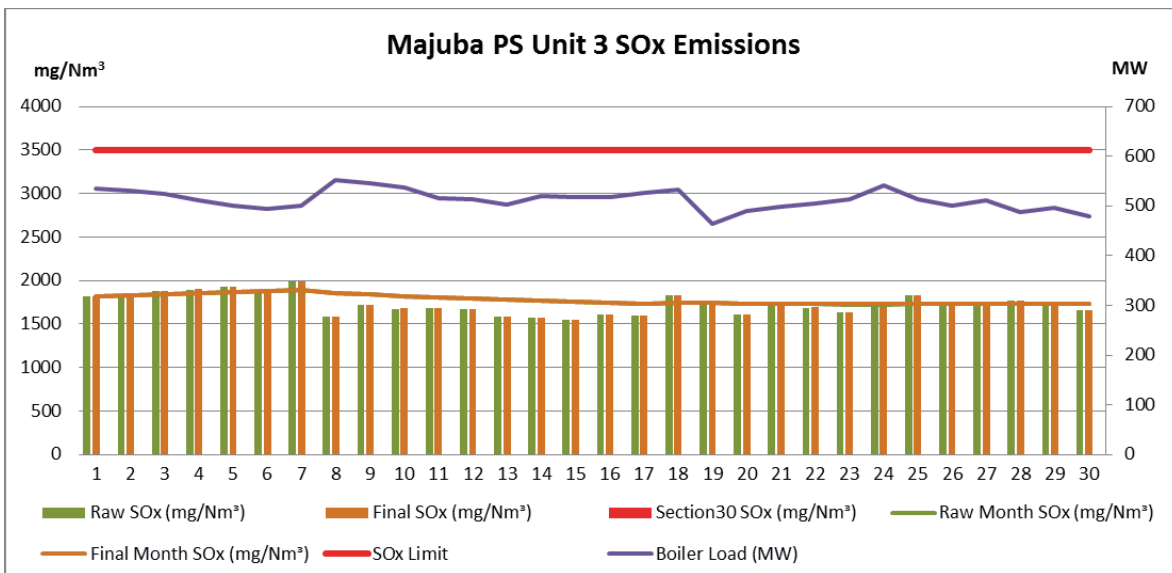


Figure 9. Sox emissions (daily averages) for the month of November 2018 against emission limit for Unit 3

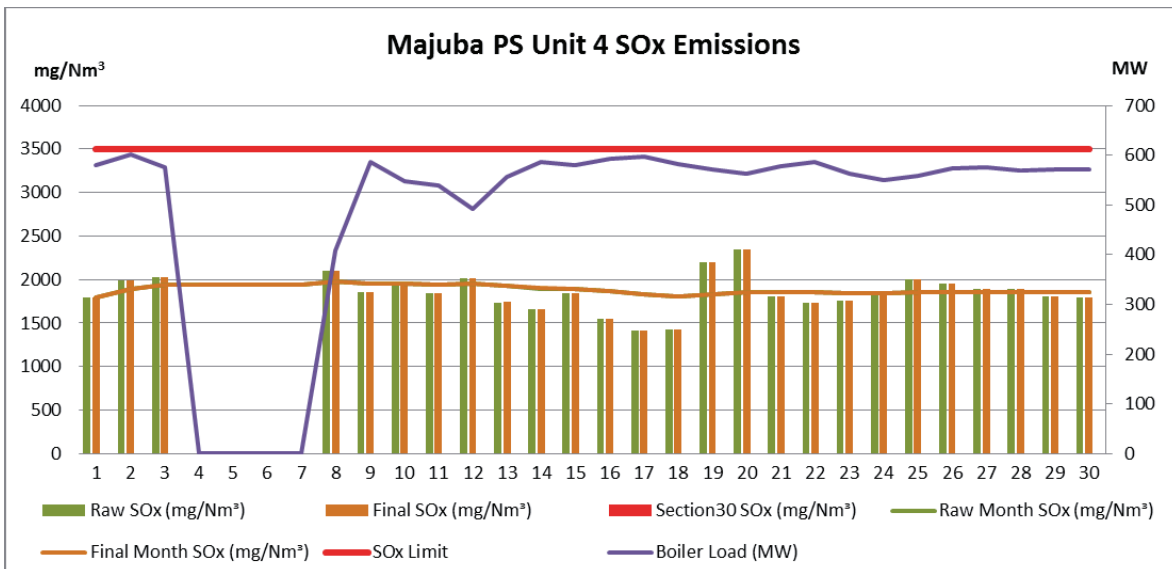


Figure 10. Sox emissions (daily averages) for the month of November 2018 against emission limit for Unit 4

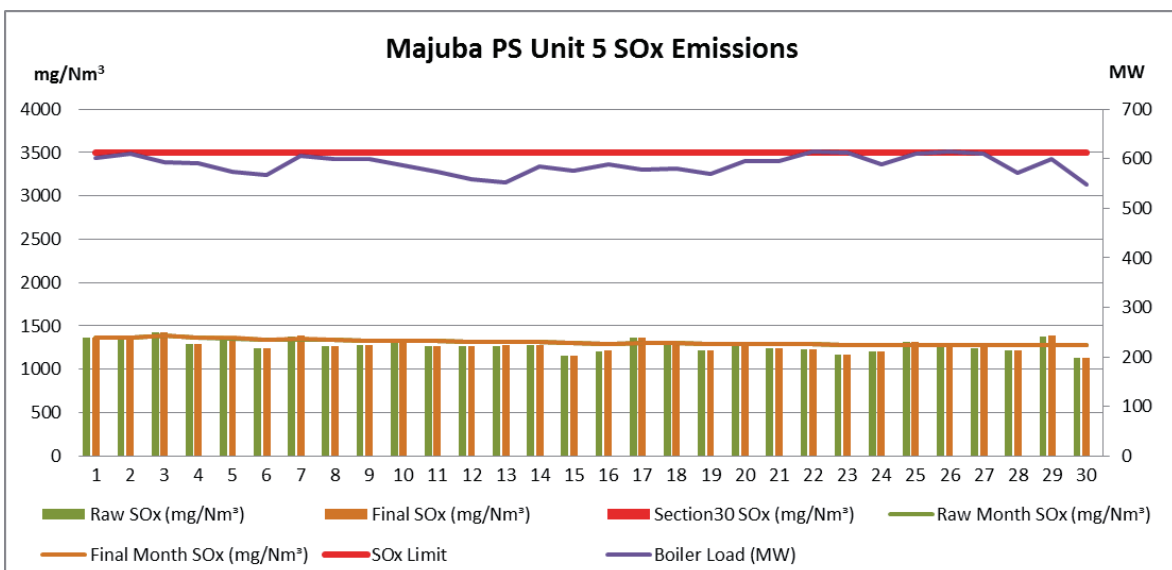


Figure 11. Sox emissions (daily averages) for the month of November 2018 against emission limit for Unit 5

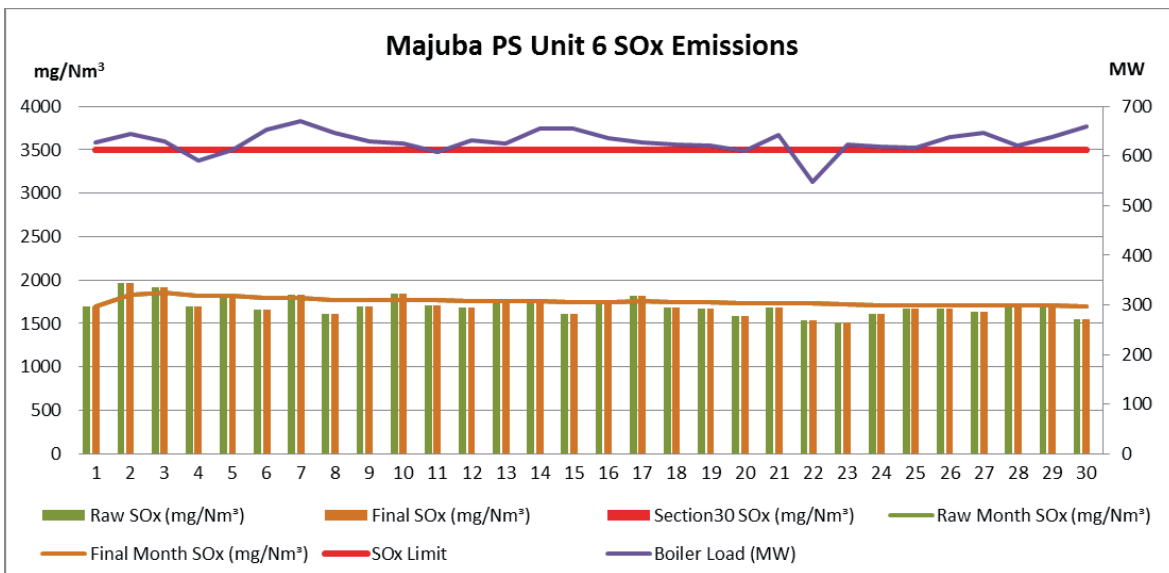


Figure 12. Sox emissions (daily averages) for the month of November 2018 against emission limit for Unit 6

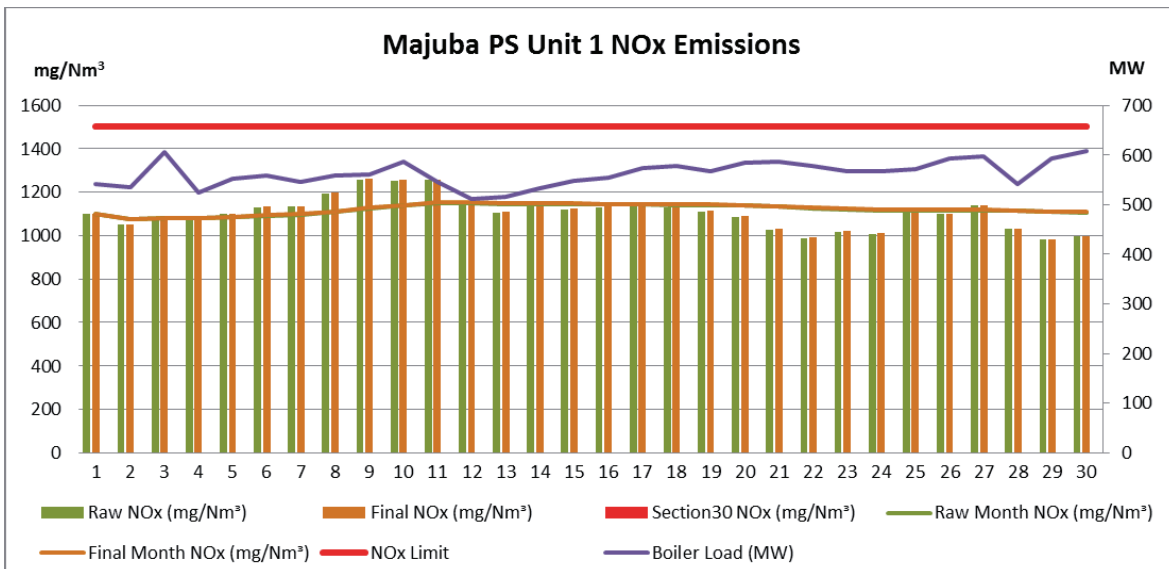


Figure 13. Nox emissions (daily averages) for the month of November 2018 against emission limit for Unit

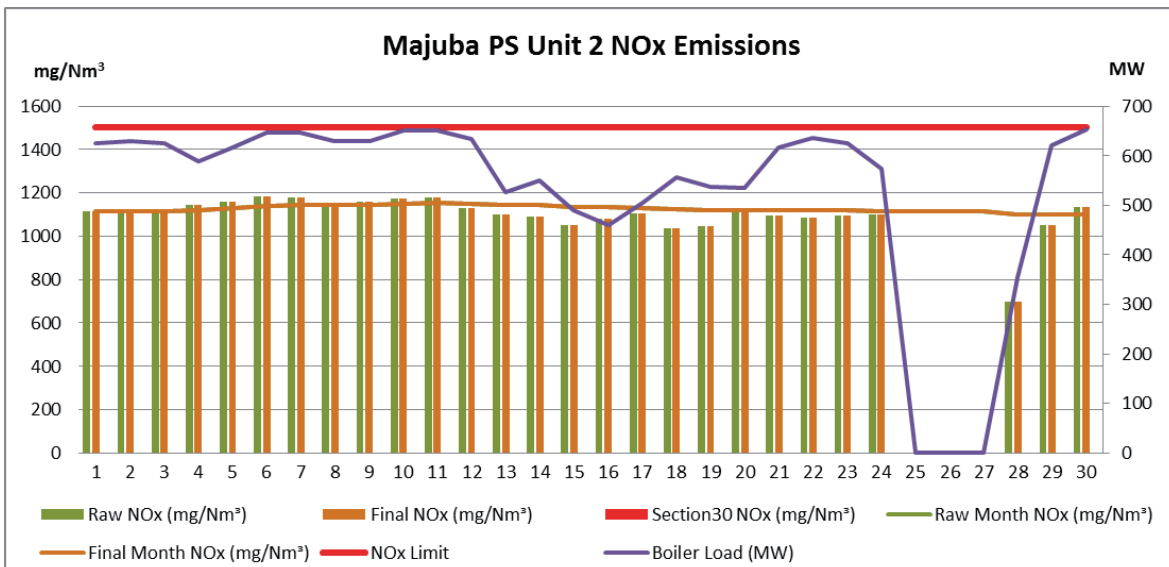


Figure 14. Nox emissions (daily averages) for the month of November 2018 against emission limit for Unit 2

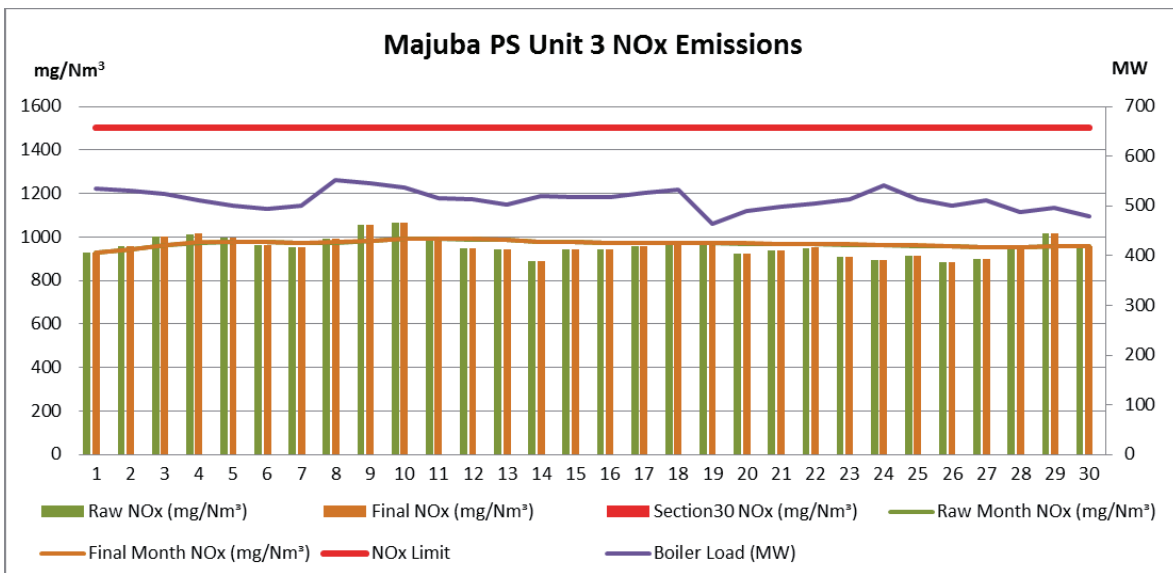


Figure 15. Nox emissions (daily averages) for the month of November 2018 against emission limit for Unit 3

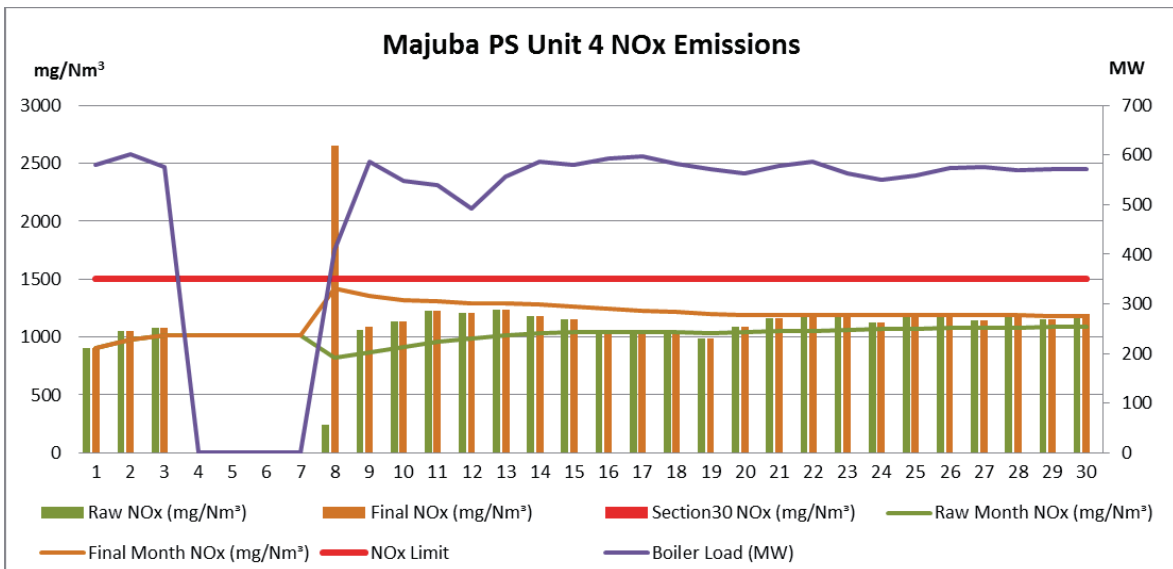


Figure 16. Nox emissions (daily averages) for the month of November 2018 against emission limit for Unit 4

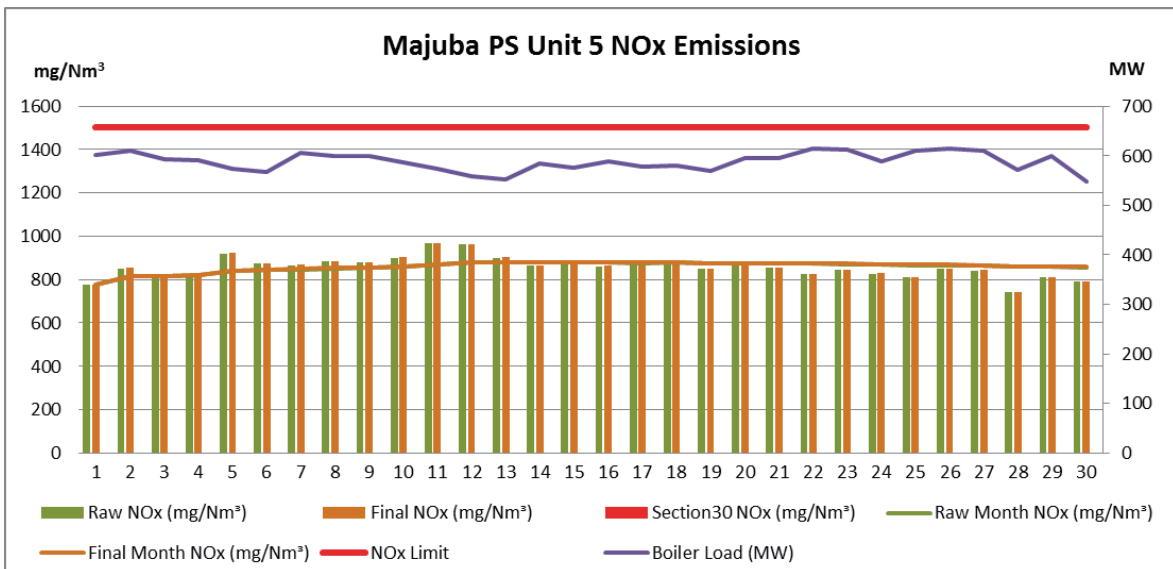


Figure 17. Nox emissions (daily averages) for the month of November 2018 against emission limit for Unit 5

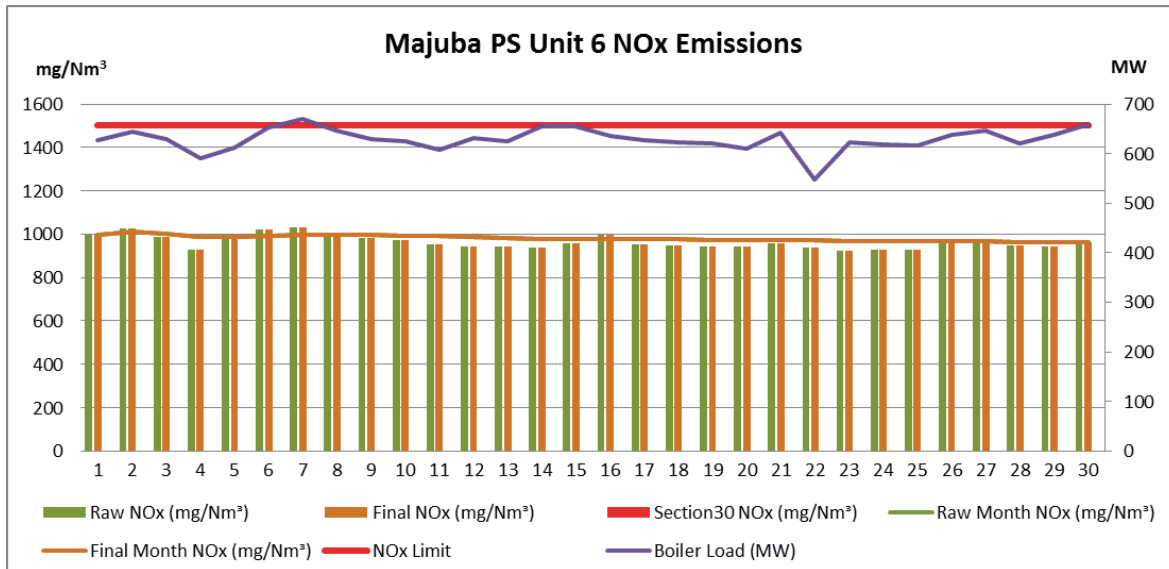


Figure 18. Nox emissions (daily averages) for the month November 2018 against emission limit for Unit 6

Table 4: Monthly tonnages for the month of November 2018

Unit	PM (tons)	SO ₂ (tons)	NO _x (tons)	CO ₂ (tons)
1	41.5	4 101	2 651	
2	45.4	3 814	2 330	
3	128.9	3 474	1 923	
4	76.6	3 508	2 171	
5	19.1	3 136	2 105	
6	66.0	4 286	2 429	
Sum	377.5	22 319	13 609	

Table 5: Average monthly concentrations (mg/Nm³) for the month of November 2018

Unit	PM (Mg/Nm ³)	SO ₂ (Mg/Nm ³)	NO ₂ (Mg/Nm ³)	CO ₂ (Mg/Nm ³)
1	17.78	1713	1108	
2	24.03	1825	1099	
3	64.11	1731	957	
4	42.73	1856	1184	
5	7.77	1278	858	
6	26.10	1701	964	

Table 6: Each unit and respective days operating under normal operation, days in grace period, and section 30 days respectively

Unit	Operating Days (DD:HH:MM)			
	Normal operation	In grace period	Under S30	Unit off load
1	29:21:45	00:00:00	00:00:00	00:02:15
2	25:09:45	00:00:00	00:00:00	04:14:15
3	30:00:00	00:00:00	00:00:00	00:00:00
4	25:06:05	00:00:00	00:00:00	04:17:55
5	29:23:35	00:00:00	00:00:00	00:00:25
6	30:00:00	00:00:00	00:00:00	00:00:00

CO₂ and O₂ Relationship

Calculation: CO₂% + O₂% = 19.5-21.5%

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
31-Oct							8.2	7.7	8.5	10.1	6.8	6.7						
01-Nov							7.9	7.5	8.5	8.3	6.8	6.7						
02-Nov							8.0	7.6	8.6	8.9	6.8	6.7						
03-Nov							7.3	7.7	8.5	9.0	6.8	6.7						
04-Nov							8.1	7.8	8.3		6.8	6.7						
05-Nov							7.8	7.6	9.1		6.8	6.7						
06-Nov							7.7	7.4	9.2		6.7	6.7						
07-Nov							7.8	7.4	9.2		6.7	6.7						
08-Nov							7.9	7.5	8.8	9.6	6.7	6.7						
09-Nov							7.5	7.6	8.4	8.8	6.7	6.7						
10-Nov							7.1	7.5	8.4	10.1	6.8	6.7						
11-Nov							7.6	7.5	8.7	10.0	6.8	6.7						
12-Nov							8.1	7.7	8.8	11.0	6.8	6.6						
13-Nov							7.8	8.7	8.9	9.8	6.7	6.6						
14-Nov							7.6	8.0	8.3	9.4	6.8	6.6						
15-Nov							7.5	8.6	8.6	9.4	6.7	6.6						
16-Nov							7.6	9.3	8.3	7.9	6.7	6.6						
17-Nov							7.5	8.8	8.2	8.1	6.7	6.6						
18-Nov							7.5	8.0	8.5	8.1	6.8	6.6						
19-Nov							7.6	8.2	10.1	8.2	6.8	6.6						
20-Nov							7.4	9.0	9.1	8.5	6.8	6.6						
21-Nov							7.4	7.9	8.7	8.2	6.8	6.6						
22-Nov							7.4	7.8	8.5	8.3	6.8	6.6						
23-Nov							7.7	8.1	9.1	8.7	6.8	6.6						
24-Nov							7.5	8.6	8.4	8.7	6.8	6.6						
25-Nov							7.6		9.0	8.9	6.8	6.6						
26-Nov							7.2		8.9	8.8	6.8	6.6						
27-Nov							7.3		8.9	8.2	6.8	6.6						
28-Nov							7.7	9.9	9.1	8.5	6.7	6.6						
29-Nov							7.2	7.5	8.9	8.5	6.8	6.6						
30-Nov							7.4	7.2	9.2	8.4	6.7	6.6						
Totals							7.6	8.0	8.8	8.9	6.8	6.6						

Table 7: CO₂ and O₂ deviations of the Month of November 2018

*Blank spaces indicate that the unit was offline during that period except for Unit 5&6 CO₂ monitors which were faulty.

Comments on the performance and availability of each unit

UNIT 1

The unit base loaded for all of the days during the 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 off for four days. No fabric filter bags were replaced during the month.

UNIT 3

The unit base loaded for all of the days during the month. One-hundred and two 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. Sixty-eight fabric filter bags were replaced during the month.

UNIT 5

The unit base loaded for all of the days during the month. Seven fabric filter bags were replaced during the month. Unit CO₂ monitor was faulty throughout the month. Monitor could not be replaced on site and has been sent back to Germany.

UNIT 6

The unit base loaded for all of the days during the month. Twenty-five filter bags were replaced during the month. Unit CO₂ monitor was faulty throughout the month. Monitor could not be replaced on site and has been sent back to Germany.

Emergency Generation

Table 8: Emergency Generation for the month of November 2018

	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

Complaints Register

Table 9: Complaints for the month of November 2018

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

General

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

Report compiled by

ENVIRONMENTAL MANAGER: (MAJUBA)

Date 14/03/2019

Report verified by:

BOILER ENGINEERING MANAGER: (MAJUBA)

Date 19/03/2019

Hoping the above will meet your satisfaction.

Yours sincerely

SENIOR ENGINEERING MANAGER (Acting): (MAJUBA)

Date 19/03/2019