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		Review Date	September2024		

Stanley Koenaitse

Waterberg District Municipality
Private Bag X1018
Modimole
0510

skoenaite@waterberg.gov.za

Date: 2023/11/30

Enquiries: MF Dikgale
Tel: 014 762 6820

Ref: H16/1/13-AEL/M1/R1 – November 2023

Dear Mr Koenaitse

MEDUPI POWER STATION MONTHLY EMISSIONS REPORT FOR THE MONTH OF NOVEMBER 2023

This document serves as the monthly emissions report required in terms of Section 7.7.1 of Medupi Power Station Provisional Atmospheric Emission License (AEL), H16/1/13-AEL/M1/R1.

This report reflects Unit 1, 2, 3, 5 and 6 gaseous and particulate emissions performance against the AEL limit for the month of November 2023 only.

1. Raw Materials and Products


TABLE 1: QUANTITY OF RAW MATERIALS AND PRODUCTS CONSUMPTION IN NOVEMBER 2023

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption – November2023
	Coal	Tons/month	1 875 000	678 323
	Fuel Oil	Tons/month	20 000	2 701
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Production Rate in Month of November 2023
	Energy	GWh	3 571.2	1436.68
	Ash Emitted	Tons/month	not specified	150.4

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Date	Daily Reportable Hours of Operation						Coal usage	Production rate (MW)					
	U1	U2	U3	U4	U5	U6		U1	U2	U3	U4	U5	U6
01-Nov	24.0	24.0	24.0	0.0	24.0	24.0	36296	710	600	682	Off	721	794
02-Nov	24.0	24.0	24.0	0.0	24.0	24.0	35091	697	550	660	Off	721	794
03-Nov	2.0	24.0	24.0	0.0	19.1	24.0	27376	496	603	629	Off	720	793
04-Nov	0.0	24.0	24.0	0.0	0.0	24.0	20991	Off	604	634	Off	Off	794
05-Nov	0.0	24.0	24.0	0.0	0.0	24.0	21548	Off	604	616	Off	314	772
06-Nov	0.0	24.0	24.0	0.0	0.0	24.0	21844	Off	604	610	Off	454	756
07-Nov	0.0	24.0	24.0	0.0	0.0	24.0	25109	Off	604	638	Off	579	771
08-Nov	0.0	15.8	24.0	0.0	18.1	24.0	25432	Off	653	638	Off	665	736
09-Nov	0.0	0.0	24.0	0.0	24.0	24.0	20556	Off	Off	640	Off	661	743
10-Nov	0.0	0.0	24.0	0.0	24.0	24.0	20221	Off	Off	629	Off	666	699
11-Nov	0.0	0.0	24.0	0.0	14.0	24.0	17261	Off	Off	626	Off	516	761
12-Nov	0.0	0.0	24.0	0.0	0.0	0.3	9580	Off	Off	598	Off	165	607
13-Nov	0.0	0.0	24.0	0.0	14.9	0.0	12921	Off	Off	612	Off	663	Off
14-Nov	0.0	0.0	24.0	0.0	24.0	0.0	13823	Off	Off	639	Off	654	Off
15-Nov	0.0	0.0	24.0	0.0	24.0	0.0	14067	Off	Off	633	Off	684	Off
16-Nov	0.0	0.0	24.0	0.0	24.0	0.0	14992	Off	263	617	Off	673	Off
17-Nov	0.0	6.0	24.0	0.0	24.0	0.0	21809	Off	702	602	Off	678	160
18-Nov	0.0	24.0	24.0	0.0	17.9	0.7	24018	Off	757	608	Off	635	524
19-Nov	0.0	24.0	24.0	0.0	0.0	24.0	21597	Off	757	648	Off	Off	696
20-Nov	0.0	24.0	24.0	0.0	0.0	24.0	21659	Off	697	626	Off	Off	702
21-Nov	0.0	24.0	24.0	0.0	0.0	24.0	21512	Off	676	613	Off	Off	696
22-Nov	0.0	24.0	24.0	0.0	0.0	24.0	23069	Off	717	620	Off	312	641
23-Nov	0.0	24.0	24.0	0.0	10.0	24.0	27188	Off	705	624	Off	587	595
24-Nov	0.0	24.0	24.0	0.0	24.0	24.0	26850	Off	653	620	Off	615	580
25-Nov	0.0	24.0	24.0	0.0	2.7	24.0	24390	Off	700	584	Off	492	649
26-Nov	0.0	24.0	24.0	0.0	0.0	24.0	23802	Off	720	592	Off	468	599
27-Nov	0.0	24.0	24.0	0.0	0.0	24.0	23127	Off	722	577	Off	509	600
28-Nov	0.0	24.0	24.0	0.0	2.1	24.0	26159	Off	722	577	Off	603	500
29-Nov	0.0	24.0	24.0	0.0	24.0	24.0	29213	Off	722	577	Off	661	740
30-Nov	0.0	24.0	24.0	0.0	24.0	24.0	26822	off	718	594	Off	617	655

NB: Operating hours less than 24 highlighted in pink; Unit OFF highlighted in Red.

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2. Abatement Technology

Table 2: Abatement Equipment Control Technology efficiency for month of November2023

Associated Unit/Stack	Technology Type	Efficiency	FFP Utilization
Unit 1	Fabric Filter Plant (FFP)	99.918%	100%
Unit 2	Fabric Filter Plant (FFP)	99.888%	100%
Unit 3	Fabric Filter Plant (FFP)	99.895%	100%
Unit 4	Fabric Filter Plant (FFP)	Off	off
Unit 5	Fabric Filter Plant (FFP)	99.928%	100%
Unit 6	Fabric Filter Plant (FFP)	99.957%	100%

Note: FFP does not have bypass mode operation, hence plant 100% Utilised.

3. Energy Source Characteristics

TABLE 3: ENERGY SOURCE MATERIAL CHARACTERISTICS FOR THE MONTH OF NOVEMBER 2023

Characteristic	Stipulated Range (% by weight on a dry basis)	Monthly Average Content (% by weight on a dry basis)
	Coal	
Sulphur Content	1.3 - 2.2	1.29
Ash Content	35 - 39	35.16

TABLE 4: ENERGY SOURCE MATERIAL CHARACTERISTICS FOR THE MONTH OF NOVEMBER 2023

Characteristic	Stipulated Range (%)	Monthly Average Content (%)
	Oil	
Sulphur Content	0.5 - 3.5	2.4
Ash Content	0.02 - 0.1	0.035

4. Emissions Reporting

Medupi Power Station uses Continuous Emission Monitoring System which uses the extractive method for analysis.

The emission limits are as follows:

SO₂ Monthly = 3500 mg/Nm³

Dust Daily= 50 mg/Nm³

NO₂ Daily= 750 mg/Nm³

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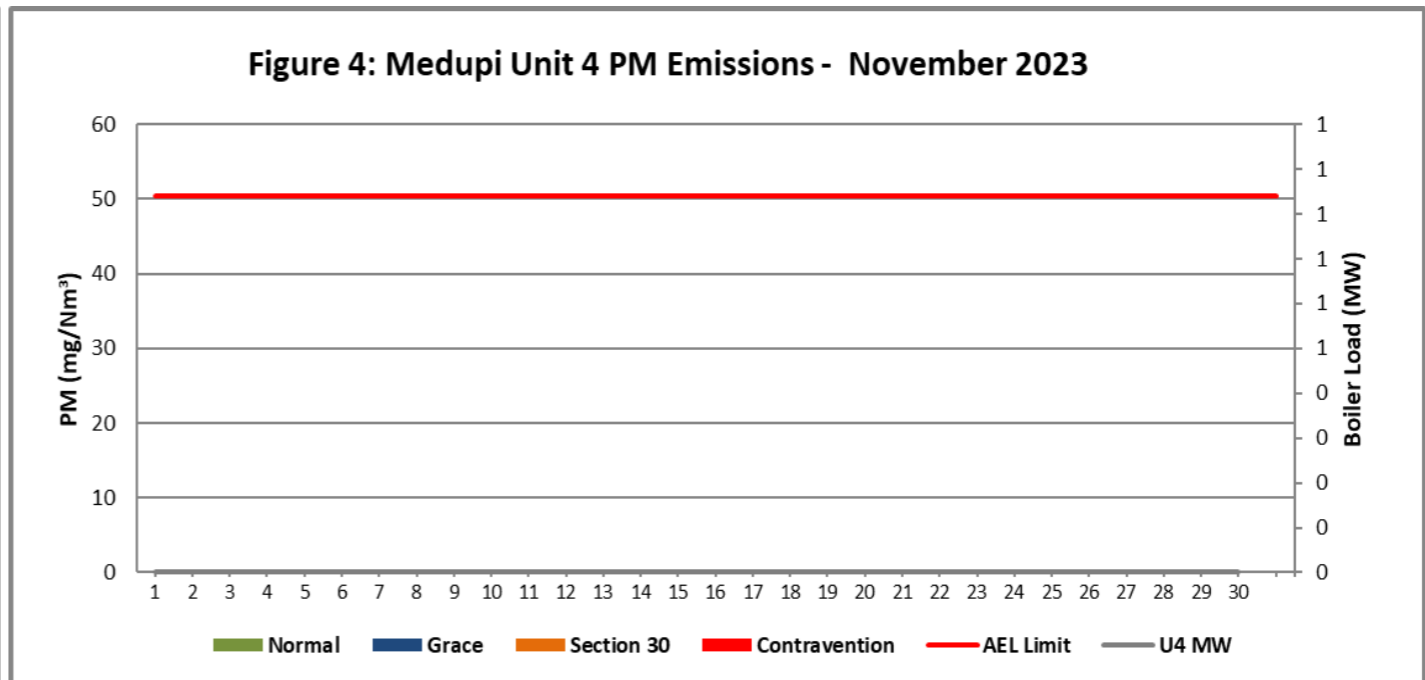
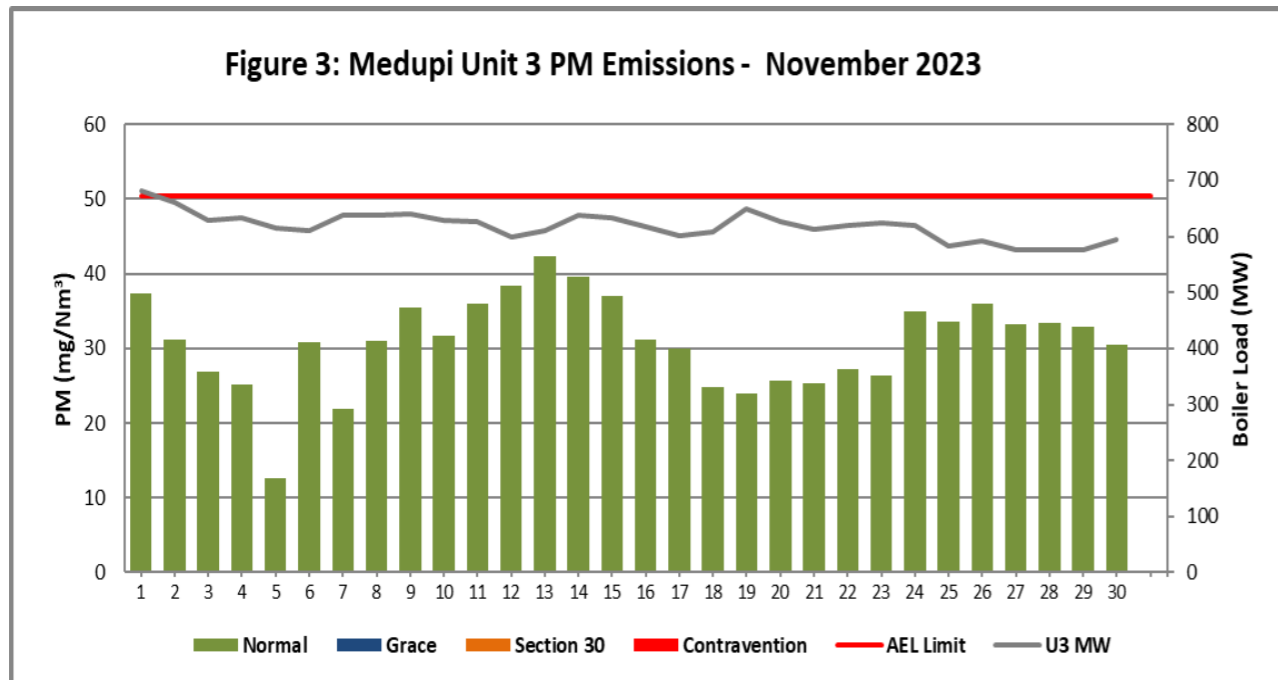
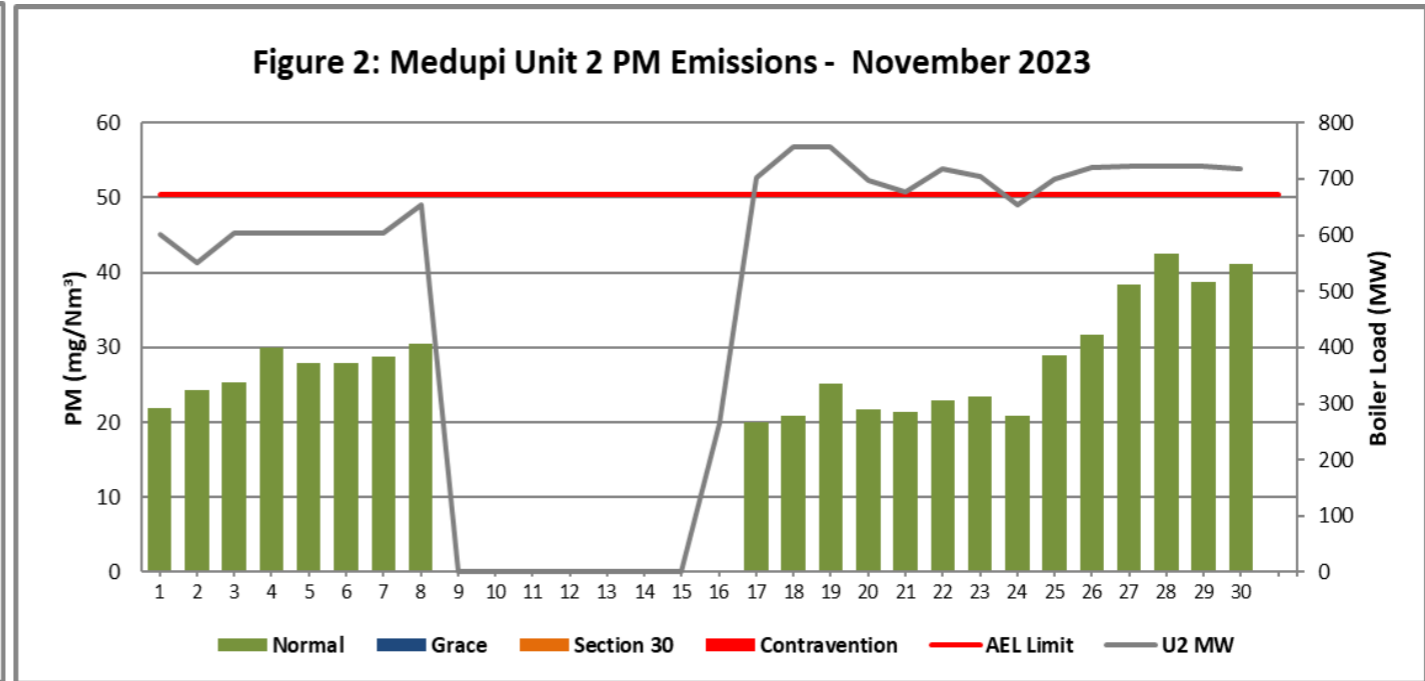
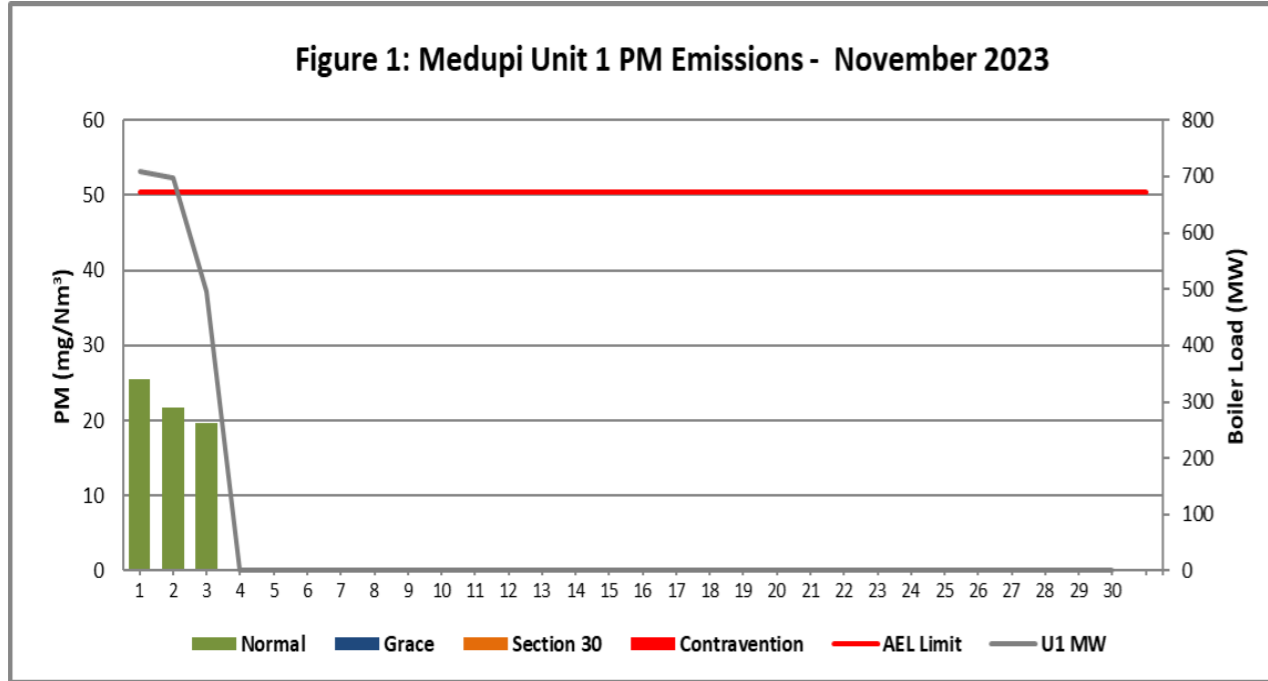
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4.1 PM Daily Averages



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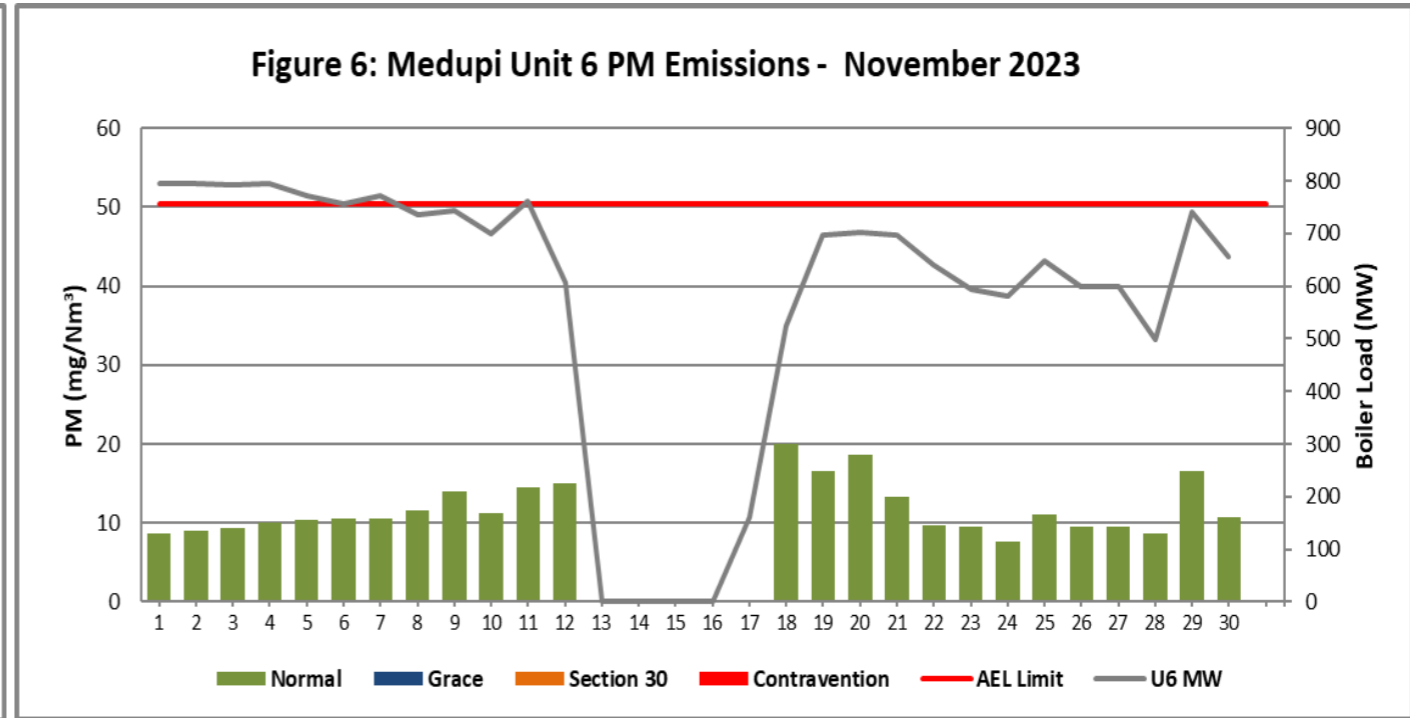
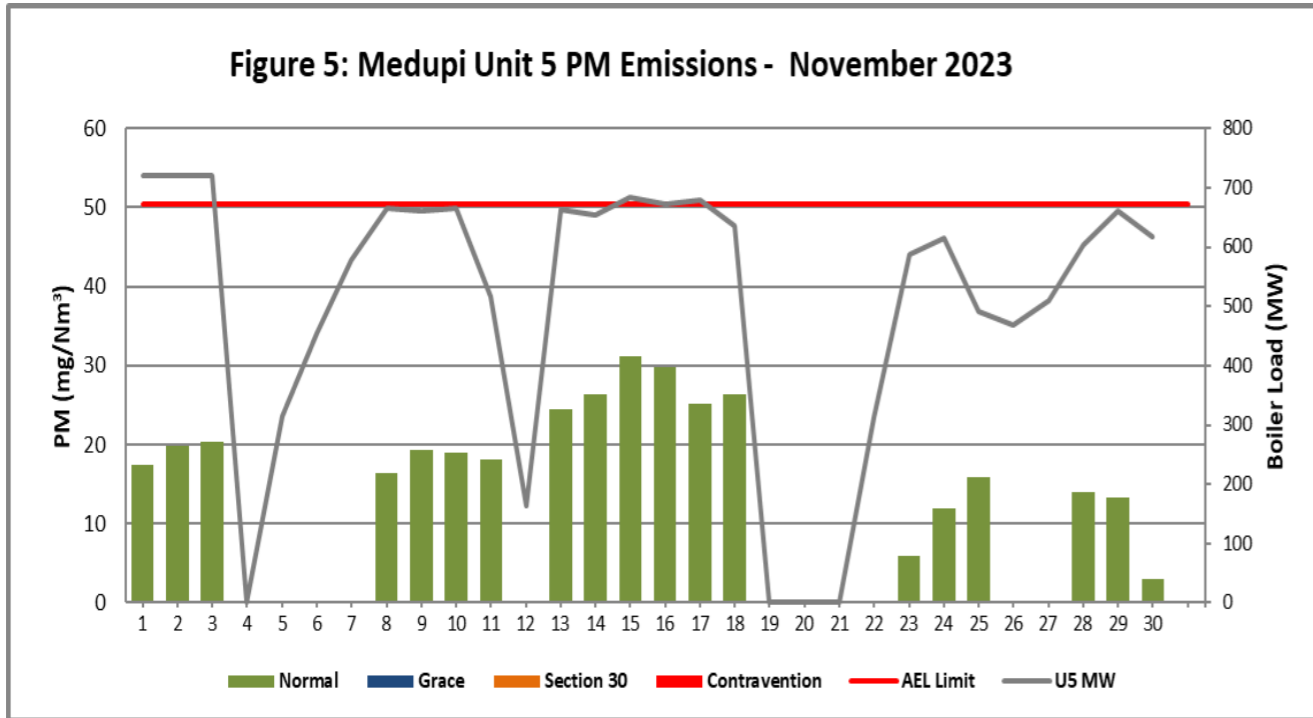
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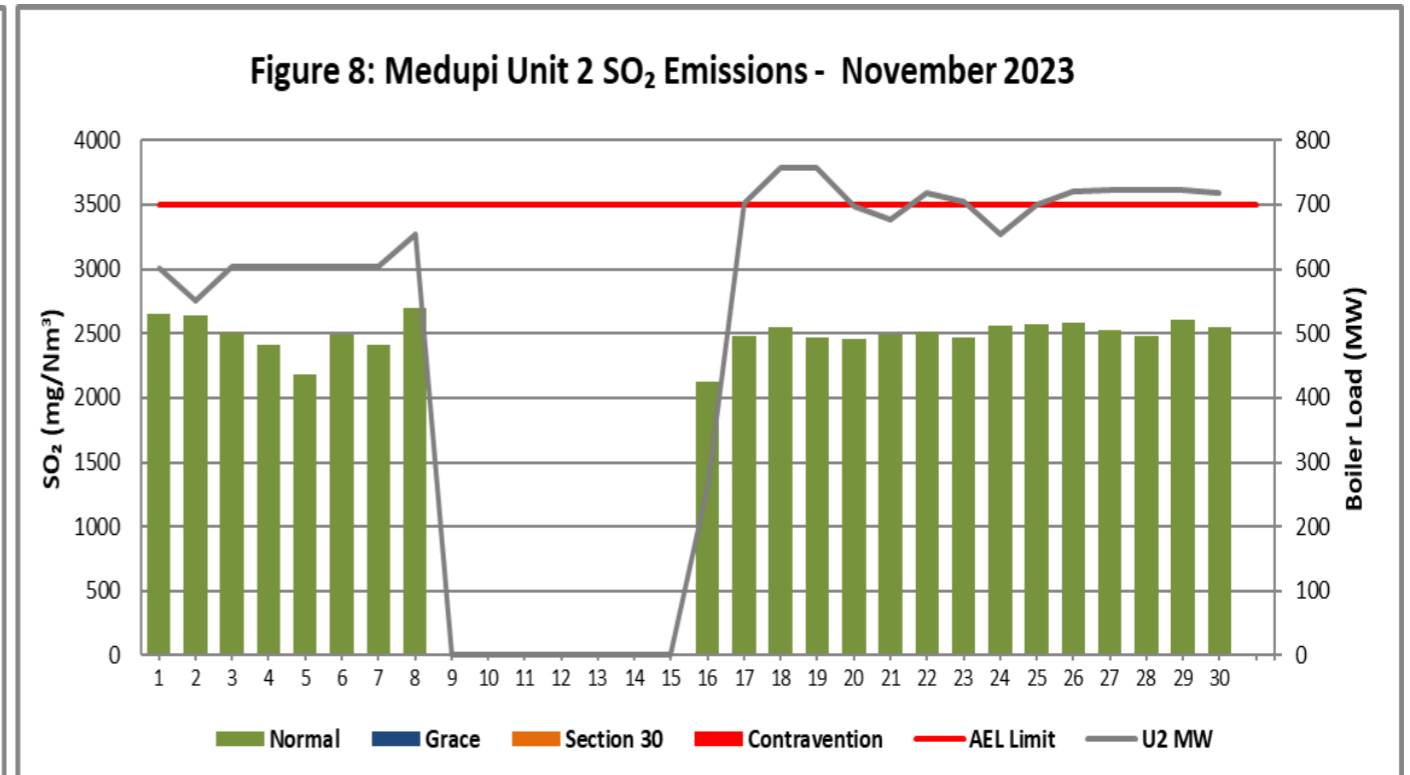
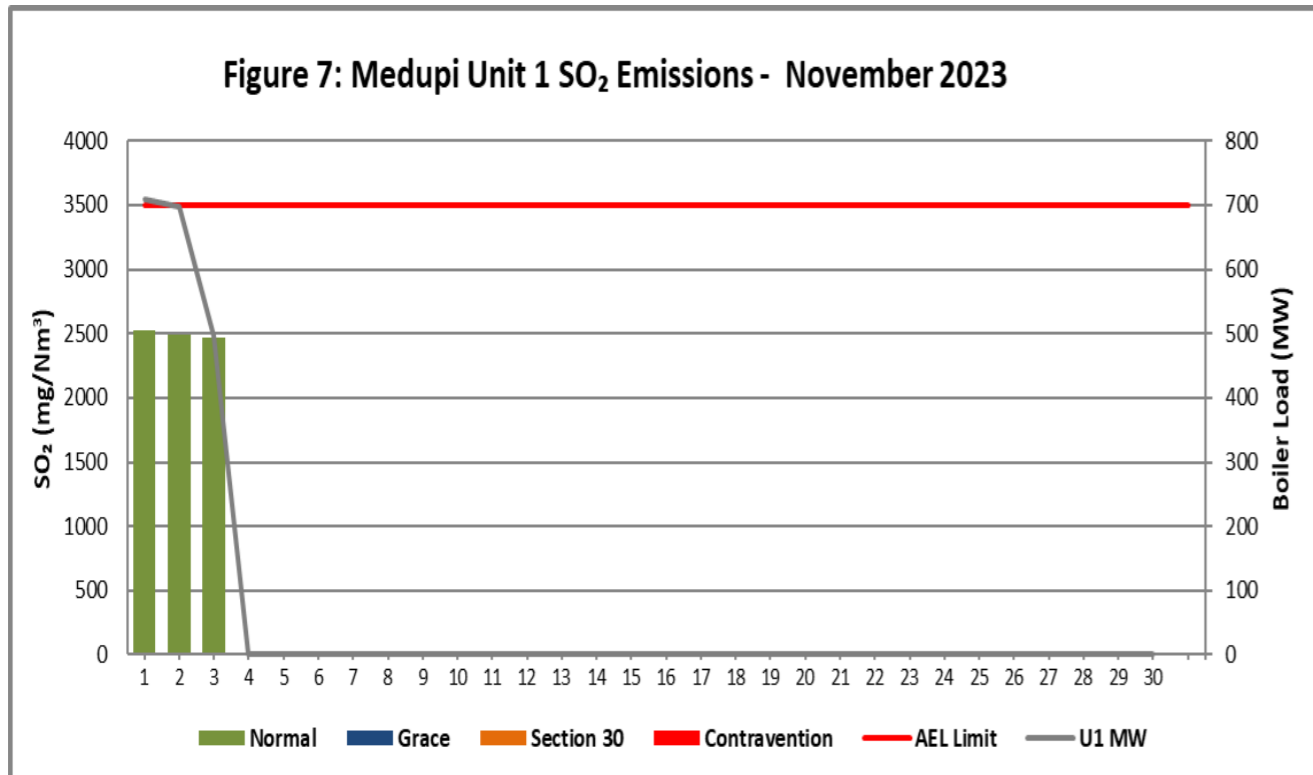


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4.2 SOx Daily Averages



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Figure 9: Medupi Unit 3 SO₂ Emissions - November 2023

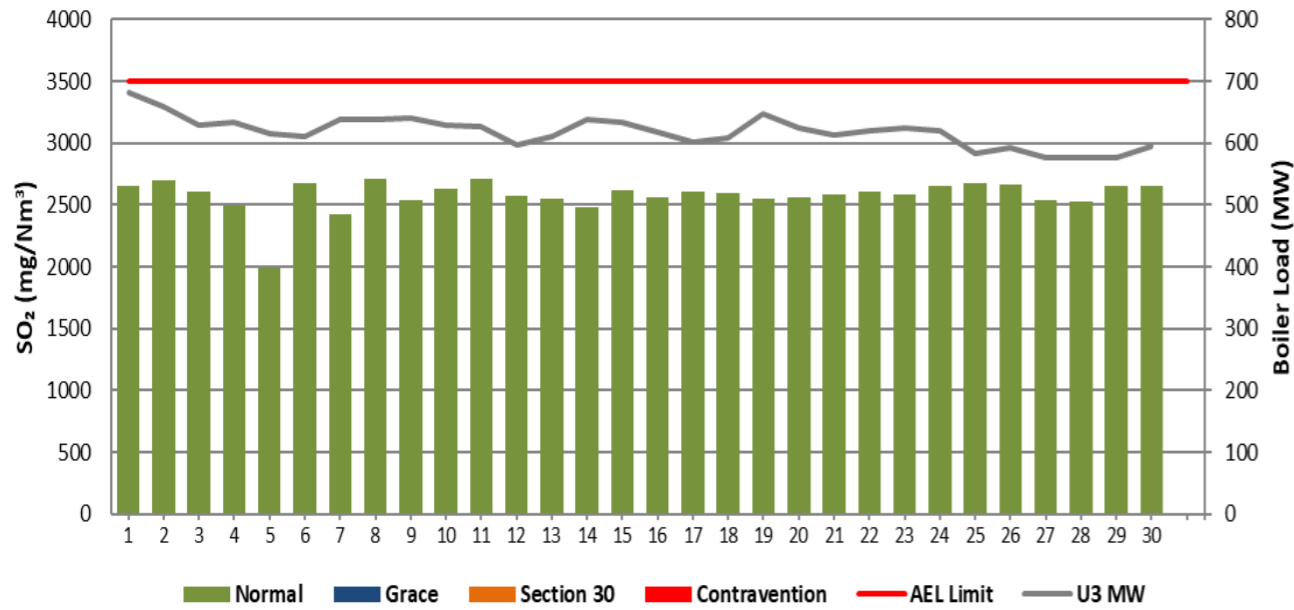


Figure 10: Medupi Unit 4 SO₂ Emissions - November 2023

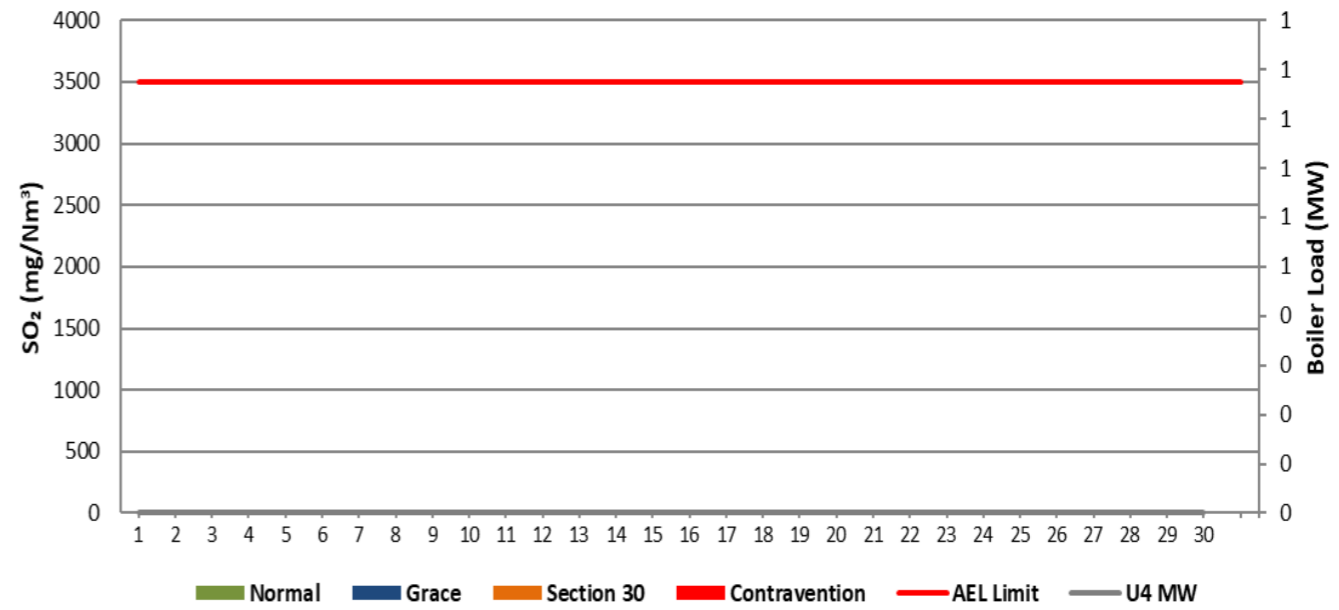


Figure 11: Medupi Unit 5 SO₂ Emissions - November 2023

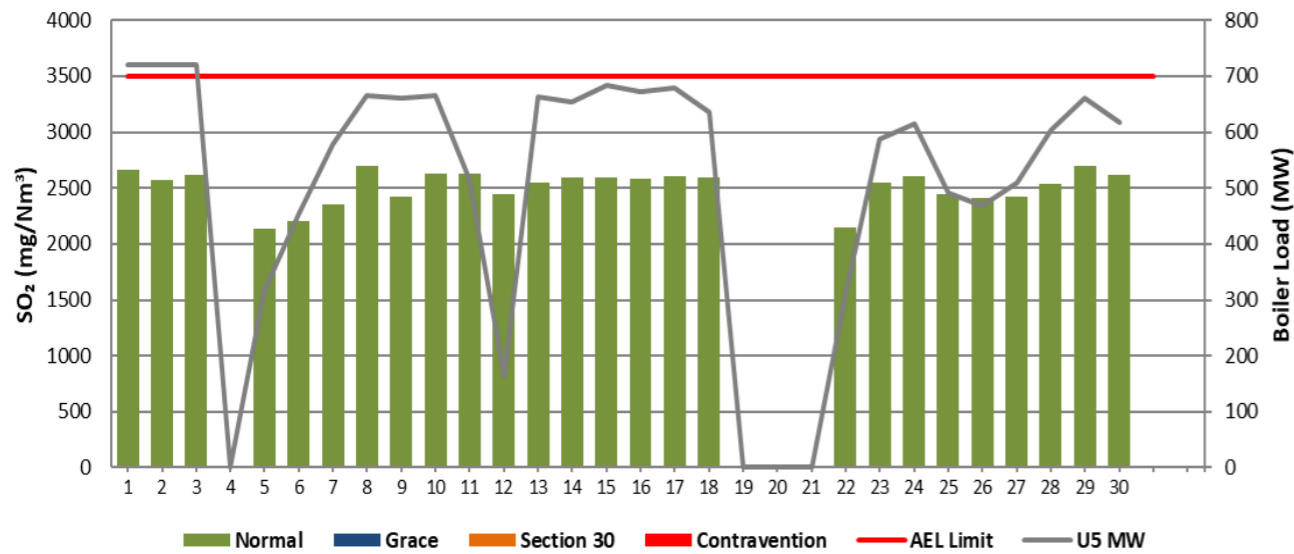
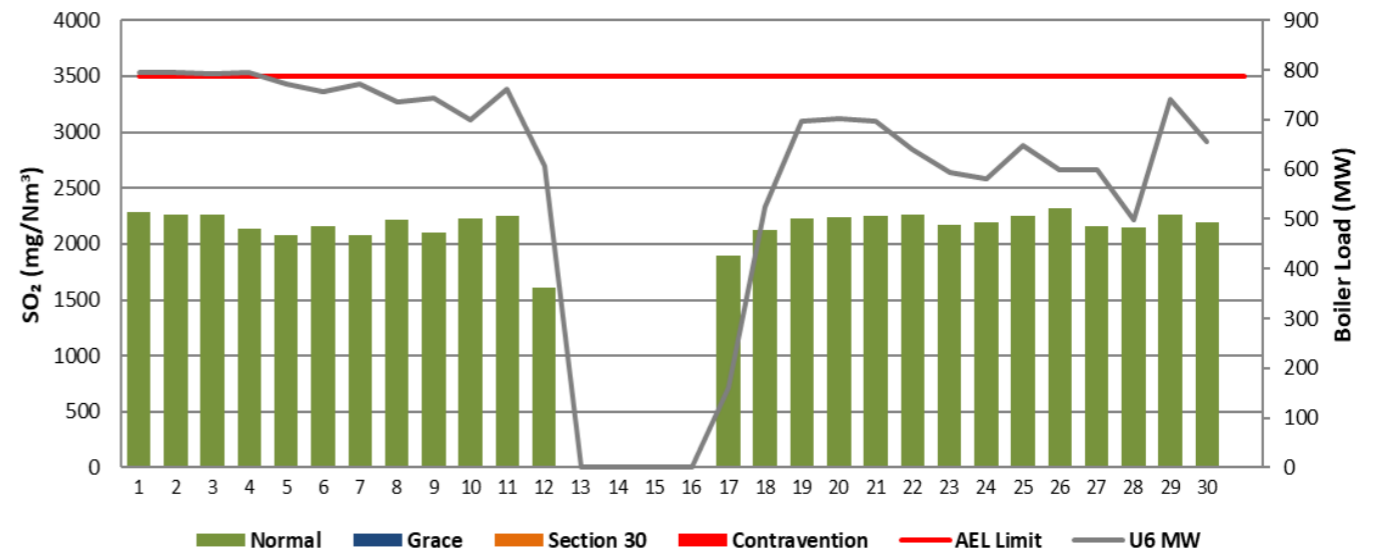


Figure 12: Medupi Unit 6 SO₂ Emissions - November 2023



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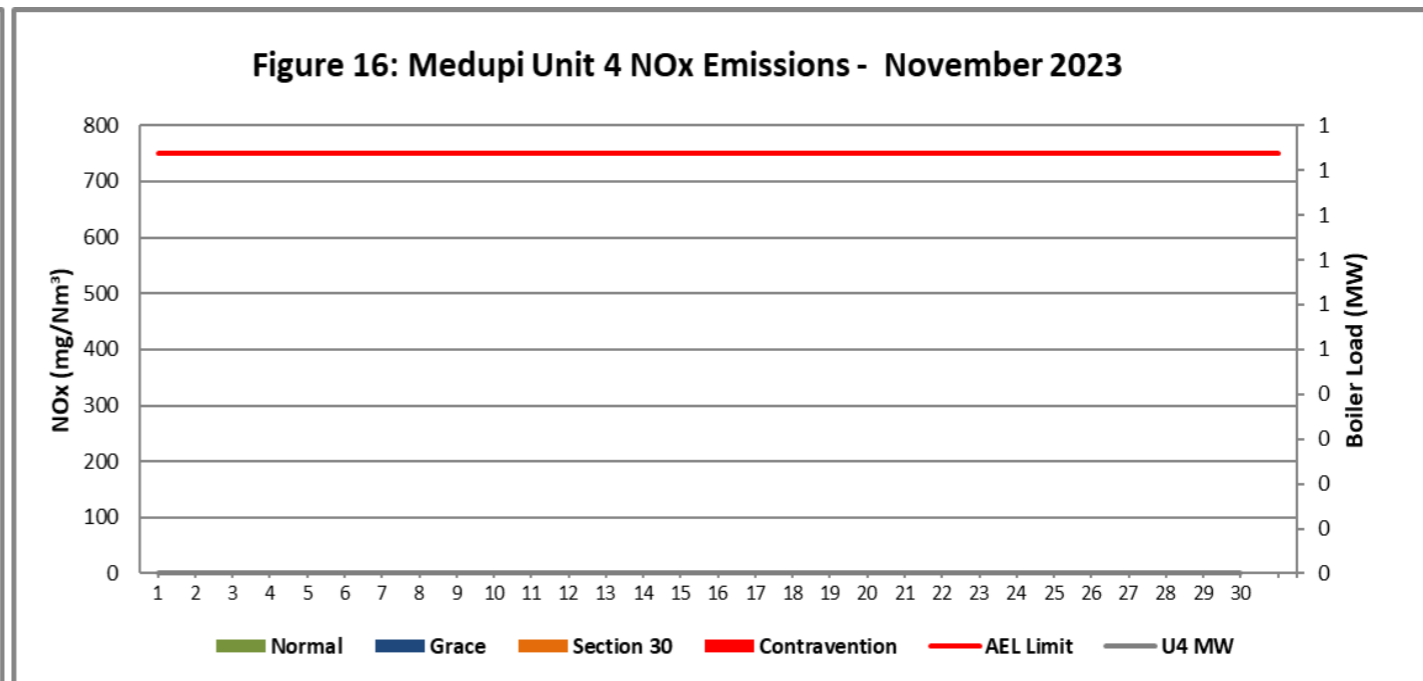
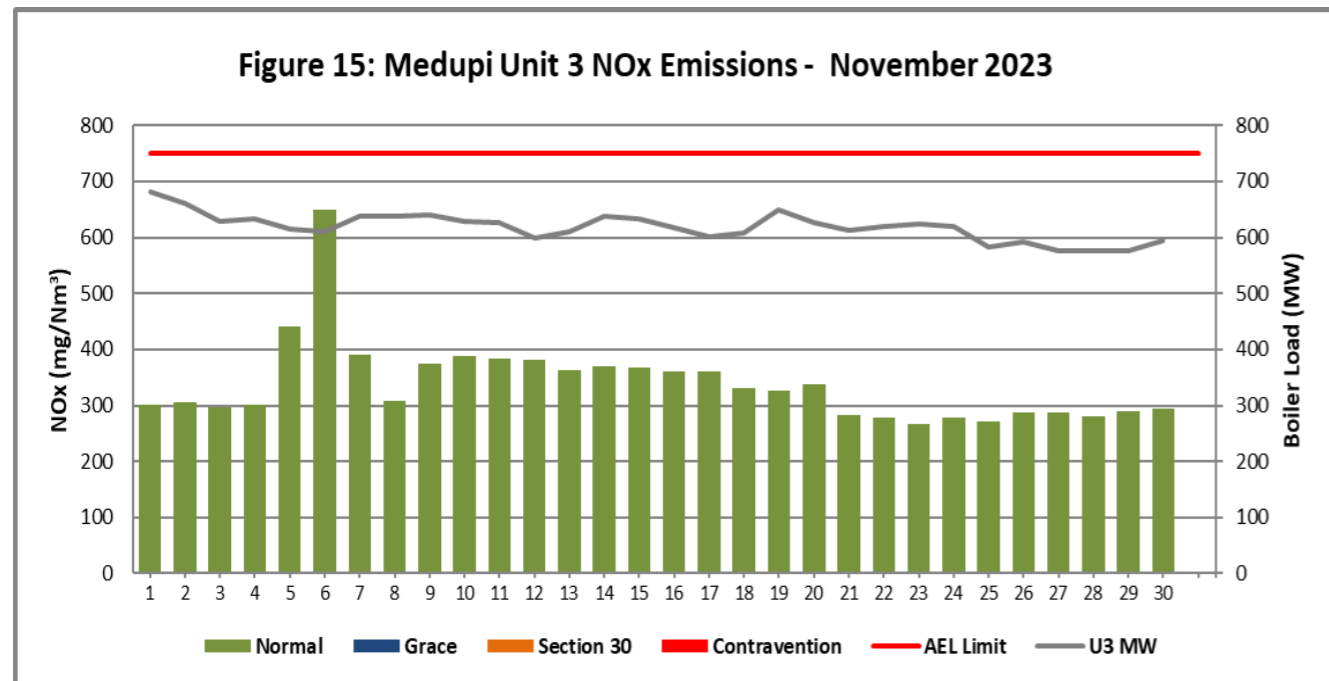
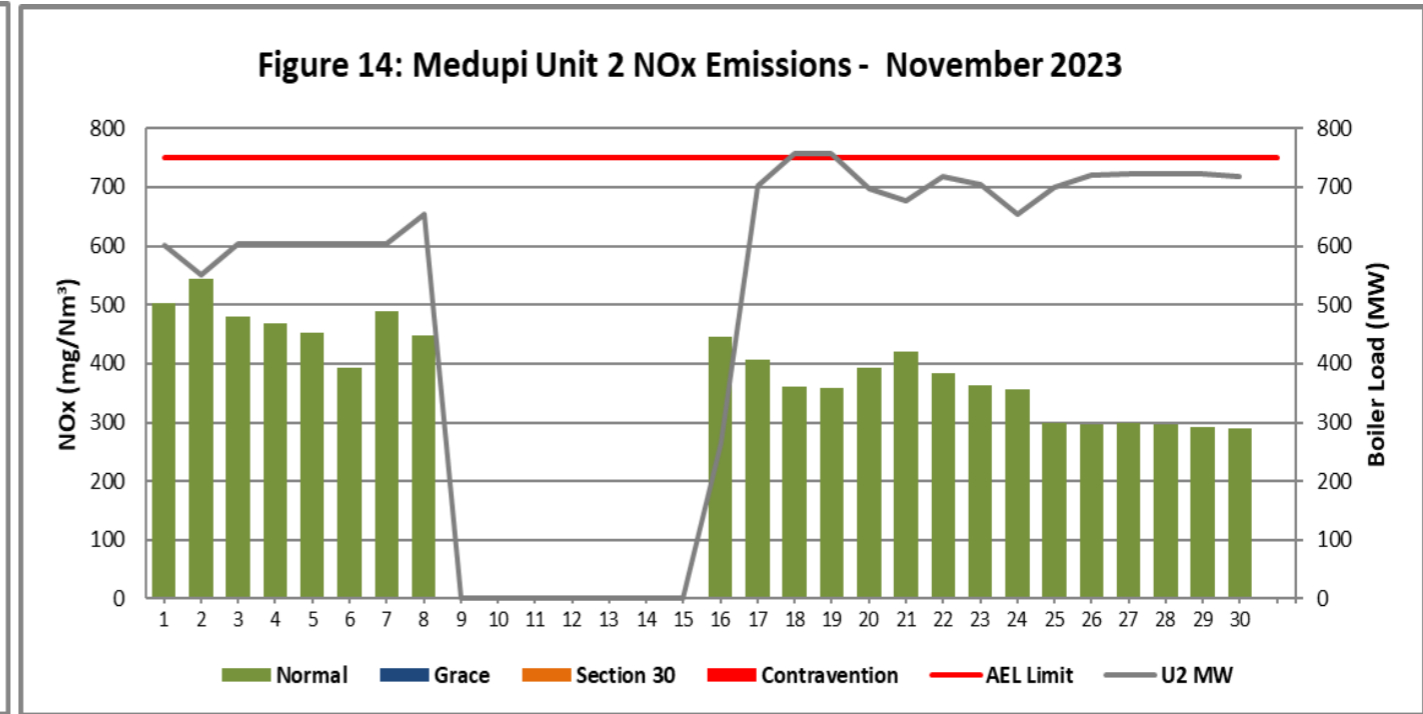
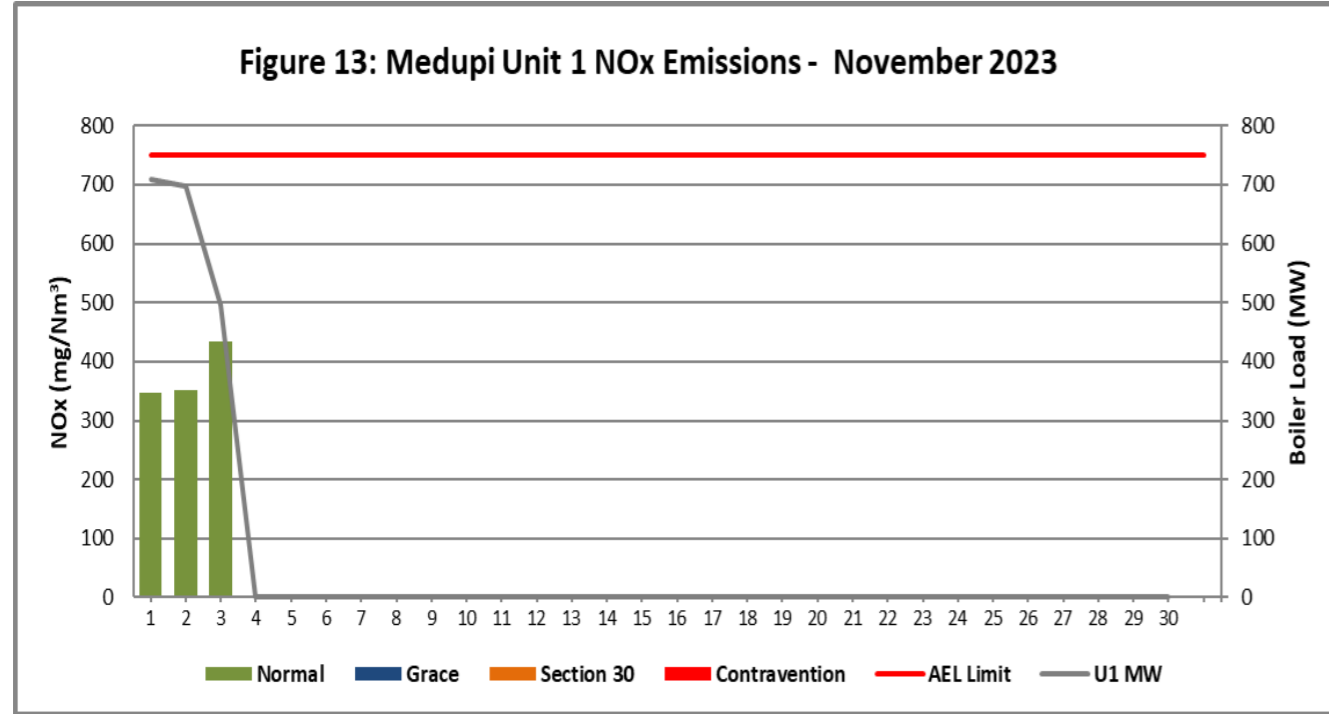
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4.3 NOx Daily Averages



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Figure 17: Medupi Unit 5 NOx Emissions - November 2023

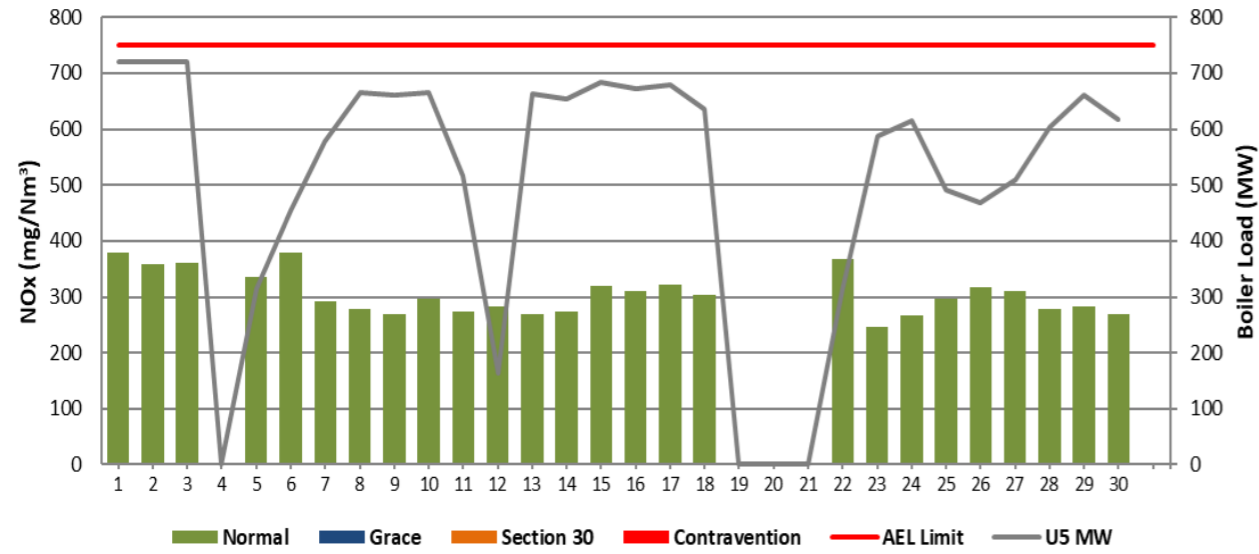
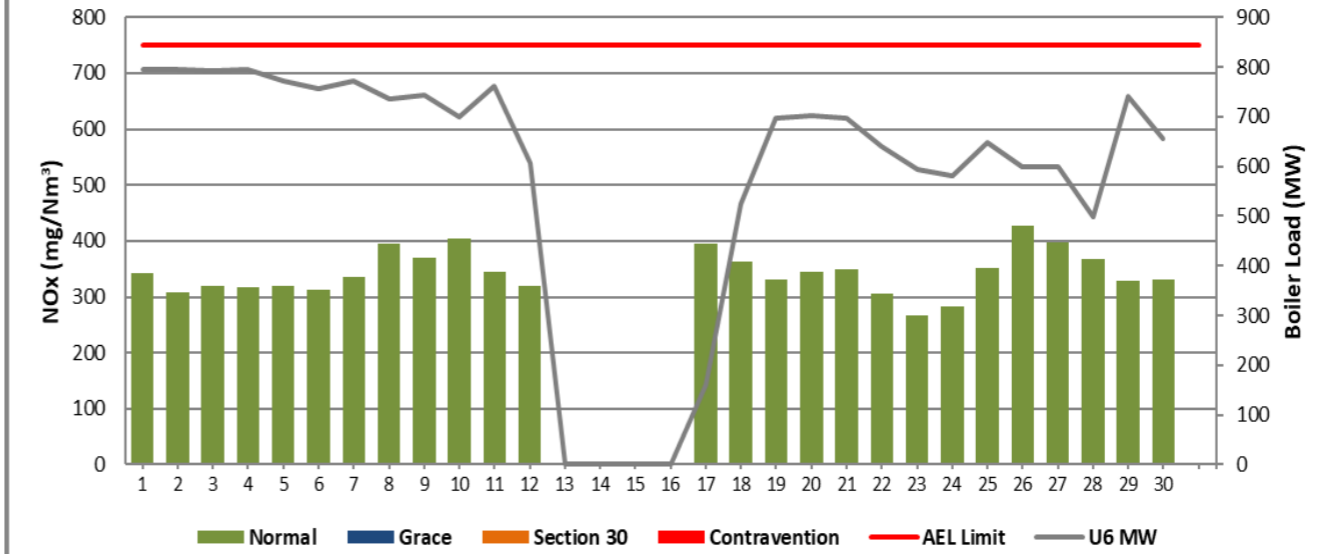


Figure 18: Medupi Unit 6 NOx Emissions - November 2023



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TABLE 6: MONTHLY TONNAGES FOR THE MONTH OF NOVEMBER 2023

Associated Unit/Stack	PM	SO ₂	NO ₂
Unit 1	3.3	354.4	49.8
Unit 2	48.1	4 488.8	689.6
Unit 3	55.4	4 632.3	607.5
Unit 4	Off	Off	Off
Unit 5	25.2	4 325.0	508.0
Unit 6	18.4	3 666.6	568.4
SUM (Tons)	150.4	17 467.0	2 423.4

TABLE 7: MONTHLY AVERAGES FOR THE MONTH OF NOVEMBER 2023

Associated Unit/Stack	Average PM (mg/Nm ³)	Average SO _x (mg/Nm ³)	Average NO _x (mg/Nm ³)
Unit 1	22.3	2 493.0	377.7
Unit 2	27.9	2 495.4	393.1
Unit 3	30.9	2 580.0	338.5
Unit 4	Off	Off	Off
Unit 5	18.8	2 512.0	305.2
Unit 6	11.9	2 168.0	343.5

5. Continuous Emission Monitoring Systems (CEMS)

- Unit 1, 2, 3, 5 and 6 Continuous Emission Monitoring Systems were always in operation when the unit was on load.

TABLE 8: PERIODS DURING WHICH CEMS WAS INOPERATIVE

Date	CEMS status	Comments
N/A	N/A	N/A

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TABLE 9: CEMS MONITOR RELIABILITY PERCENTAGE (%)

Associated Unit/Stack	PM	SO ₂	NO ₂	O ₂
Unit 1	100.0	100.0	100.0	100.0
Unit 2	88.6	90.2	90.0	88.6
Unit 3	100.0	0	0	0
Unit 4	Off	Off	Off	Off
Unit 5	99.6	98.0	98.0	97.4
Unit 6	99.0	99.5	99.5	99.5

Notes: SO₂, O₂ and NO was Changed to a Unity Factor (1) for accurate reporting, there was a step change in the performance of the Unit 3 gas Monitor.

6. CEMS Calibration certificates and equipment used for calibration.

A service provider was appointed to calibrate CEMS equipment at Medupi Power Station, calibration certificates to be made available upon request. The service appointed for the CEMS calibration is in a process of obtaining SANAS accreditation. Verification of the CEMS after calibration is conducted internally by Eskom.


7. Ambient Air Quality Monitoring Report

The Ambient Air Quality Monitoring and Dust fall-out report for November2023 was e-mailed to the Licensing Authority.

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8. Visual inspection of the exterior walls of the fuel oil tanks and TVOC Estimation

Visual inspection was conducted and there were no leaks observed on the exterior walls of the fuel oil tanks.


TABLE 10: TOTAL VOLATILE ORGANIC COMPOUND (TVOC) FOR NOVEMBER 2023

		
CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS*		
Date:	Thursday, 30 November 2023	
Station:	Medupi Power Station	
Province:	Limpopo Province	
Tank no.	1-2	
Description:	Outdoor fuel oil storage tank	
Tank Type:	Vertical fixed roof (vented to atmosphere)	
Material stored:	Fuel Oil 150	
MONTHLY INPUT DATA FOR THE STATION Please only insert relevant monthly data inputs into the <i>blue cells</i> below Choose from a dropdown menu in the <i>green cells</i> The total VOC emissions for the month are in the <i>red cells</i> IMPORTANT: Do not change <i>any</i> other cells without consulting the AQ CoE		
MONTH:	November	
GENERAL INFORMATION:		
	Data	Unit
Total number of fuel oil tanks:	2	NA
Height of tank:*	14.2	m
Diameter of tank:	12	m
Net fuel oil throughput for the month:	2701	tons/month
Molecular weight of the fuel oil:		Lb/lb-mole
METEROLOGICAL DATA FOR THE MONTH		
	Data	Unit
Daily average ambient temperature	26.22	°C
Daily maximum ambient temperature	32.63	°C
Daily minimum ambient temperature	20.19	°C
Daily ambient temperature range	12.44	°C
Daily total insolation factor	6.14	kWh/m ² /day
Tank paint colour	Aluminum/Specular	NA
Tank paint solar absorbance	0.39	NA
FINAL OUTPUT:		
	Result	Unit
Breathing losses:	0.72	kg/month
Working losses:	0.08	kg/month
TOTAL LOSSES (Total TVOC Emissions for the month):	0.79	kg/month
<small>*Calculations performed on this spreadsheet are taken from the USEPA AP-42- Section 7.1 Organic Liquid Storage Tanks - January 1996. This spreadsheet is derived from materials provided by Jimmy Peress, PE, Tritech Consulting Engineers, 85-93 Chevy Chase Street, Jamaica, NY 11432 USA, Tel - 718-454-3920, Fax - 718-454-6330, e-mail - PeressJ@nyc.rr.com.</small>		

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9. Air quality improvements initiatives and public education and awareness campaigns

No awareness campaign for November 2023

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10. Complaints Register


TABLE 5: COMPLAINTS FOR THE MONTH OF NOVEMBER 2023

Name/ Source Code	Air pollution complaints received	Calculation of Impacts/ emissions associated with the incident	Date of complaint and date of response by the license holder	Results of investigation	Action taken to resolve the complaint
N/A	N/A	N/A	N/A	N/A	N/A


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Compiled by: Lutendo Murovhi  Date: 2023/12/21
Environmental Officer

Verified by: Malose Langa  Date: 2023/12/21
System Engineer Boiler

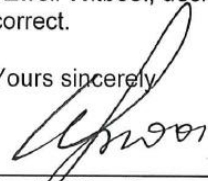
Verified by: Shu Mpangase  Date: 2023/12/21
System Engineer C&I

Supported by: Mokgadi Dikgale  Date: 2023/12/21
Environmental Manager

Supported by: Jabulani Mkhathshwa  Date: 2023/12/21
Engineering Group Manager

I Zweli Witbooi, declares that the information provided in this report is accurate and correct.

Yours sincerely



 Zweli Witbooi
GENERAL MANAGER: MEDUPI POWER STATION

Date: 2023/12/21

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