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		Review Date	September2024		

Stanley Koenaitse

Waterberg District Municipality
Private Bag X1018
Modimole
0510

skoenaite@waterberg.gov.za

Date: 2023/09/30

Enquiries: MF Dikgale

Tel: 014 762 6820

Ref: H16/1/13-AEL/M1/R1 – September2023

Dear Mr Koenaitse

MEDUPI POWER STATION MONTHLY EMISSIONS REPORT FOR THE MONTH OF SEPTEMBER 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 September 2023 only.

1. Raw Materials and Products


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

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption – September2023
	Coal	Tons/month	1 875 000	1 014 493.9
	Fuel Oil	Tons/month	20 000	2257
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Production Rate in Month of September 2023
	Energy	GWh	3 571.2	2159.98
	Ash Emitted	Tons/month	not specified	197.80

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Date	Daily Hours of Operation						Coal usage	Production rate (MW)					
	U1	U2	U3	U4	U5	U6		U1	U2	U3	U4	U5	U6
01-Sept	24.0	24.0	24.0	0.0	24.0	24.0	35871	691	729	645	Off	710	667
02-Sept	24.0	24.0	24.0	0.0	24.0	24.0	36765	705	729	641	Off	714	699
03-Sept	24.0	24.0	24.0	0.0	24.0	24.0	37720	695	732	652	Off	759	727
04-Sept	24.0	24.0	24.0	0.0	8.5	24.0	31710	679	739	641	Off	672	723
05-Sept	24.0	24.0	17.4	0.0	13.4	24.0	30541	681	716	654	Off	538	714
06-Sept	24.0	24.0	20.2	0.0	24.0	24.0	35077	694	716	613	Off	648	716
07-Sept	24.0	24.0	24.0	0.0	24.0	24.0	35556	681	692	665	Off	635	694
08-Sept	24.0	24.0	24.0	0.0	24.0	24.0	37276	694	723	668	Off	669	729
09-Sept	24.0	24.0	24.0	0.0	24.0	24.0	35479	658	684	590	Off	682	713
10-Sept	24.0	24.0	24.0	0.0	24.0	16.6	33922	655	714	618	Off	740	690
11-Sept	24.0	24.0	24.0	0.0	24.0	19.1	35476	661	732	636	Off	736	641
12-Sept	24.0	24.0	24.0	0.0	24.0	24.0	37063	715	730	659	Off	714	706
13-Sept	24.0	24.0	24.0	0.0	24.0	24.0	36313	718	732	671	Off	628	737
14-Sept	24.0	24.0	24.0	0.0	24.0	24.0	34395	746	721	678	Off	455	744
15-Sept	24.0	24.0	24.0	0.0	24.0	24.0	34434	697	696	658	Off	549	650
16-Sept	24.0	24.0	24.0	0.0	24.0	24.0	34200	679	692	608	Off	623	599
17-Sept	24.0	24.0	24.0	0.0	24.0	24.0	35346	710	695	630	Off	654	700
18-Sept	24.0	18.9	24.0	0.0	24.0	24.0	33408	693	711	644	Off	670	694
19-Sept	24.0	18.2	24.0	0.0	24.0	24.0	32036	685	561	652	Off	663	689
20-Sept	24.0	24.0	24.0	0.0	24.0	24.0	33394	690	589	631	Off	624	695
21-Sept	24.0	24.0	24.0	0.0	24.0	24.0	34350	707	608	638	Off	691	649
22-Sept	24.0	24.0	24.0	0.0	24.0	24.0	35394	755	660	625	Off	625	696
23-Sept	24.0	24.0	24.0	0.0	24.0	0.4	30502	731	739	631	Off	749	478
24-Sept	24.0	16.3	24.0	0.0	24.0	0.0	27347	712	723	632	Off	747	off
25-Sept	24.0	22.2	24.0	0.0	24.0	0.0	27504	714	523	635	Off	669	off
26-Sept	24.0	24.0	24.0	0.0	24.0	16.5	30410	683	590	604	Off	655	531
27-Sept	24.0	24.0	24.0	0.0	9.0	24.0	30261	738	600	625	Off	521	600
28-Sept	24.0	24.0	24.0	0.0	24.0	24.0	34378	763	600	655	Off	578	721
29-Sept	24.0	24.0	24.0	0.0	24.0	24.0	36139	770	600	668	Off	726	718
30-Sept	24.0	24.0	24.0	0.0	24.0	24.0	32227	683	600	621	Off	658	673

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 September2023

Associated Unit/Stack	Technology Type	Efficiency	FFP Utilization
Unit 1	Fabric Filter Plant (FFP)	99.907%	100%
Unit 2	Fabric Filter Plant (FFP)	99.899%	100%
Unit 3	Fabric Filter Plant (FFP)	99.912%	100%
Unit 4	Fabric Filter Plant (FFP)	off	off
Unit 5	Fabric Filter Plant (FFP)	99.956%	100%
Unit 6	Fabric Filter Plant (FFP)	99.965%	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 SEPTEMBER 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	1.38
Ash Content	35 - 39	34.37

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

Characteristic	Stipulated Range (%)	Monthly Average Content (%)
	Oil	
Sulphur Content	0.5 - 3.5	2.45
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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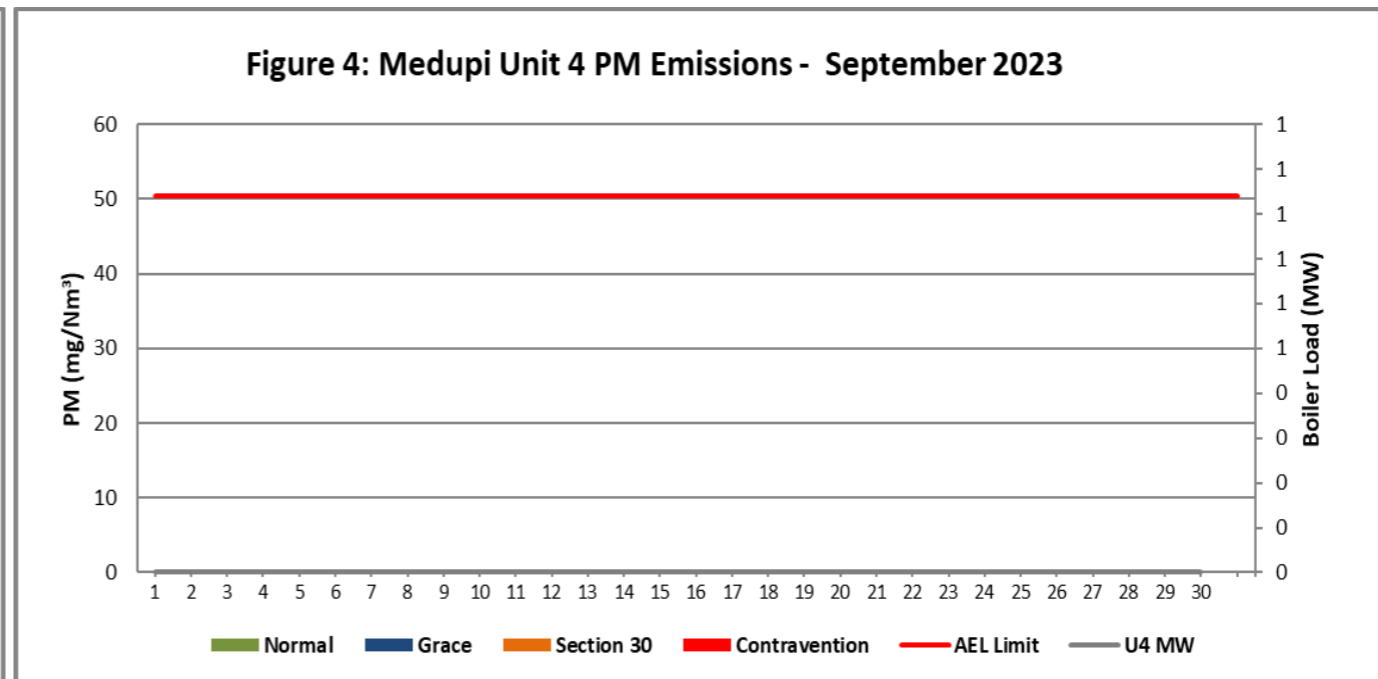
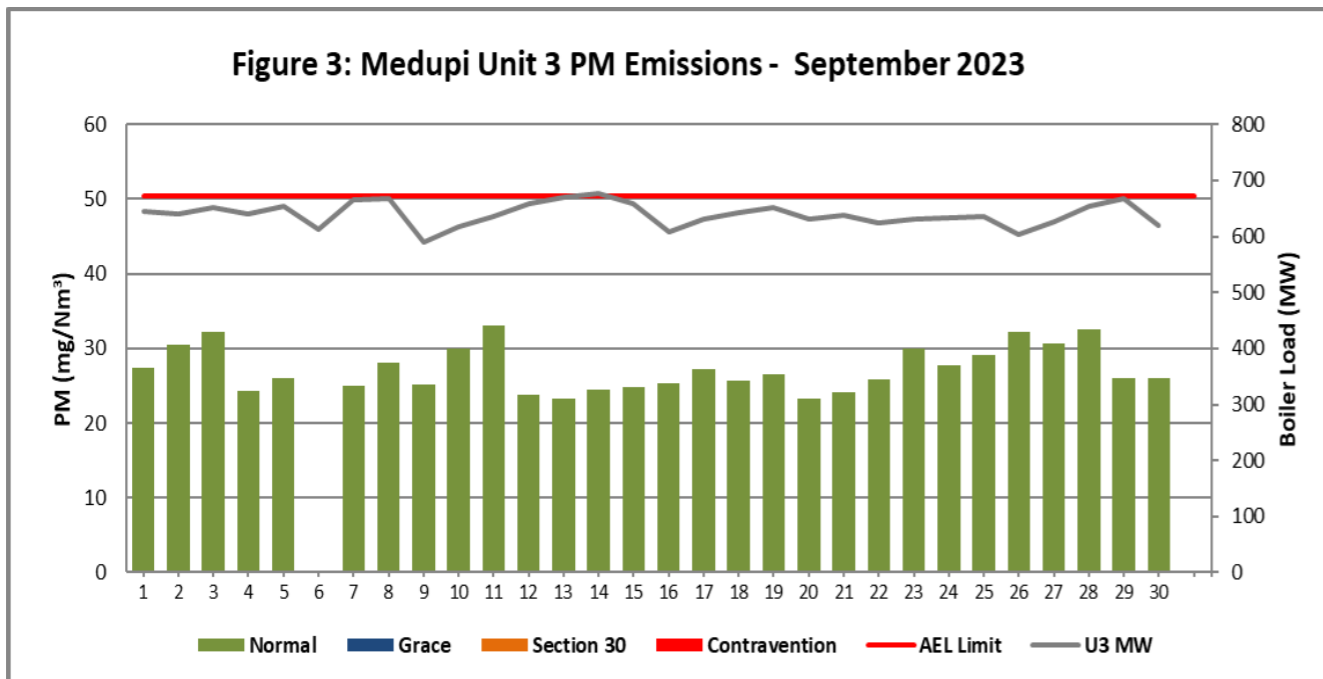
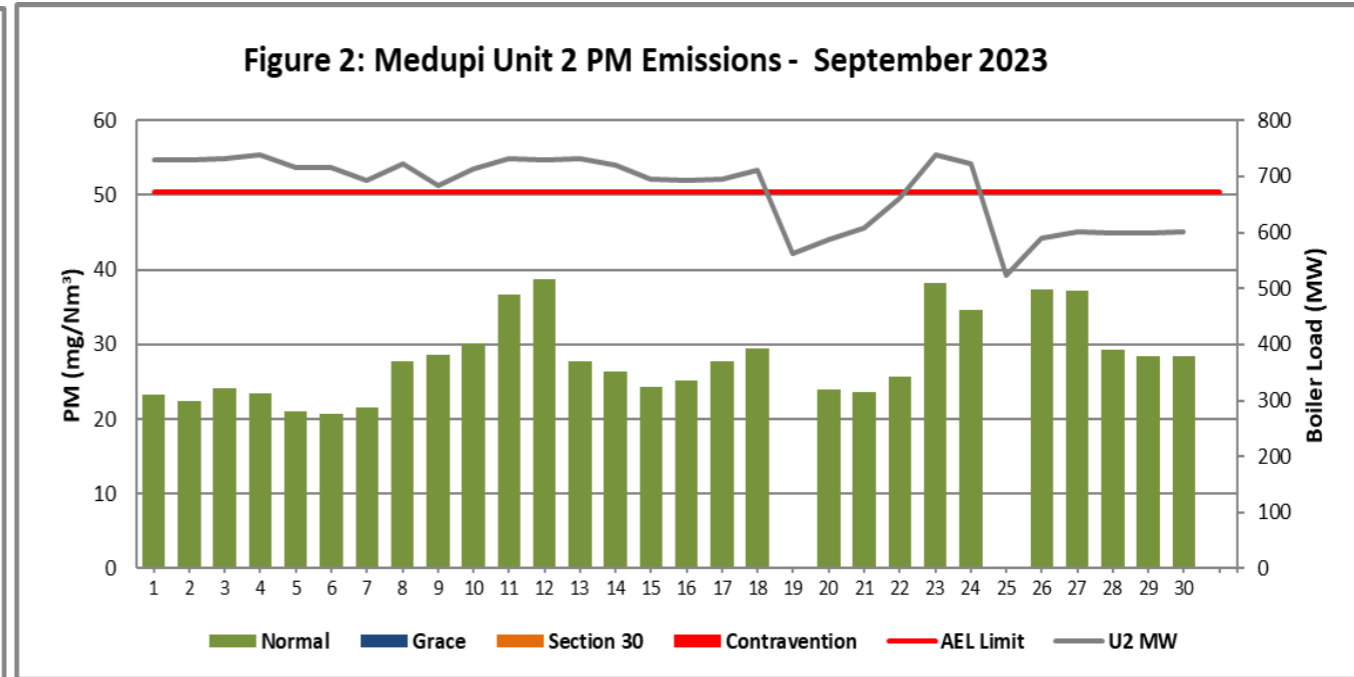
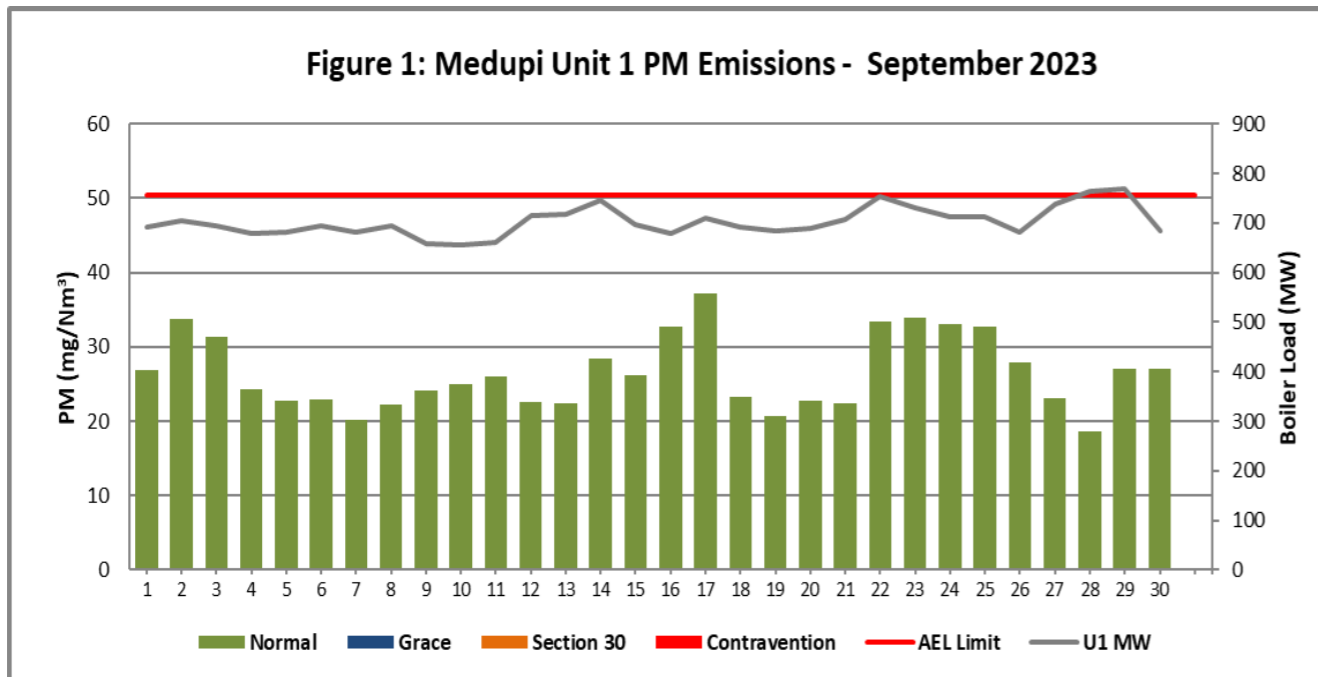
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4.1 PM Daily Averages



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Figure 5: Medupi Unit 5 PM Emissions - September 2023

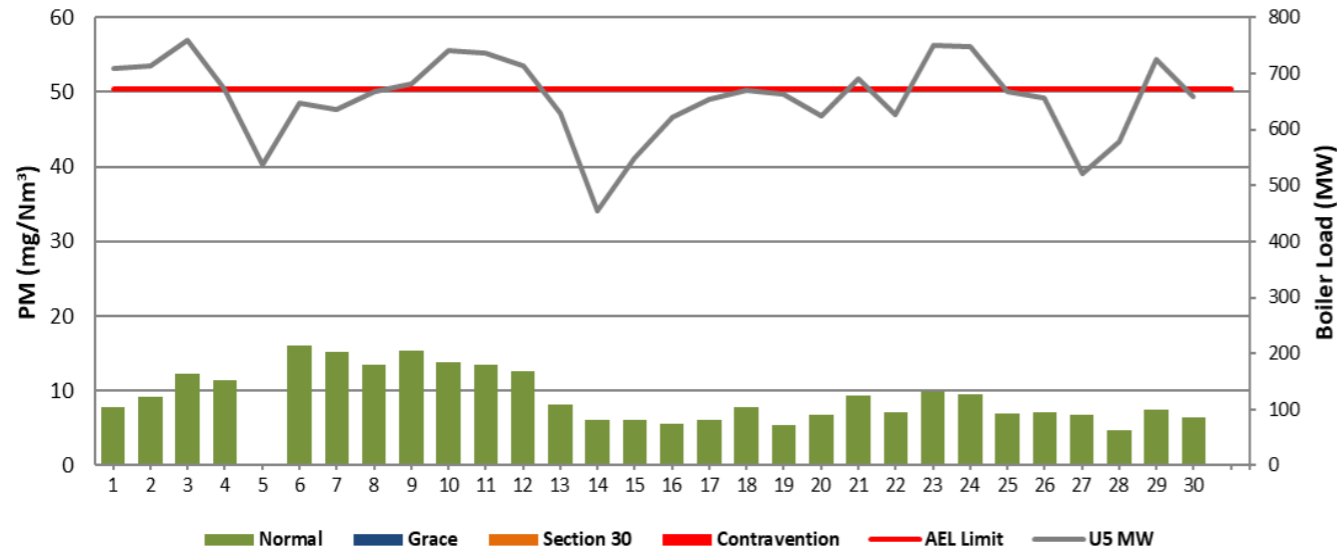
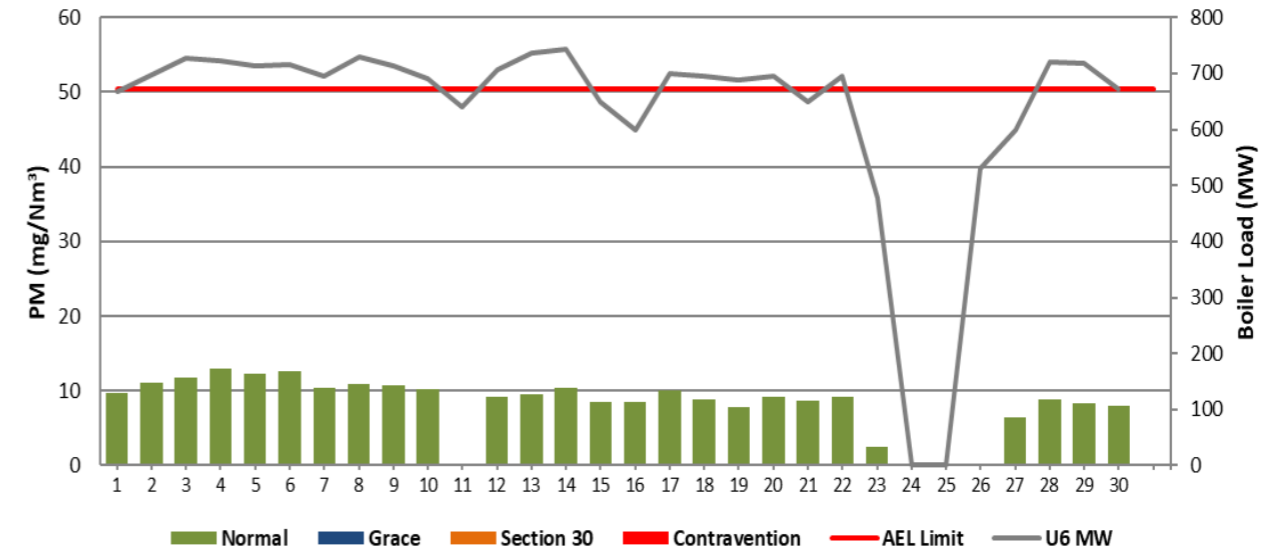


Figure 6: Medupi Unit 6 PM Emissions - September 2023



4.2 SOx Daily Averages

Figure 7: Medupi Unit 1 SO₂ Emissions - September 2023

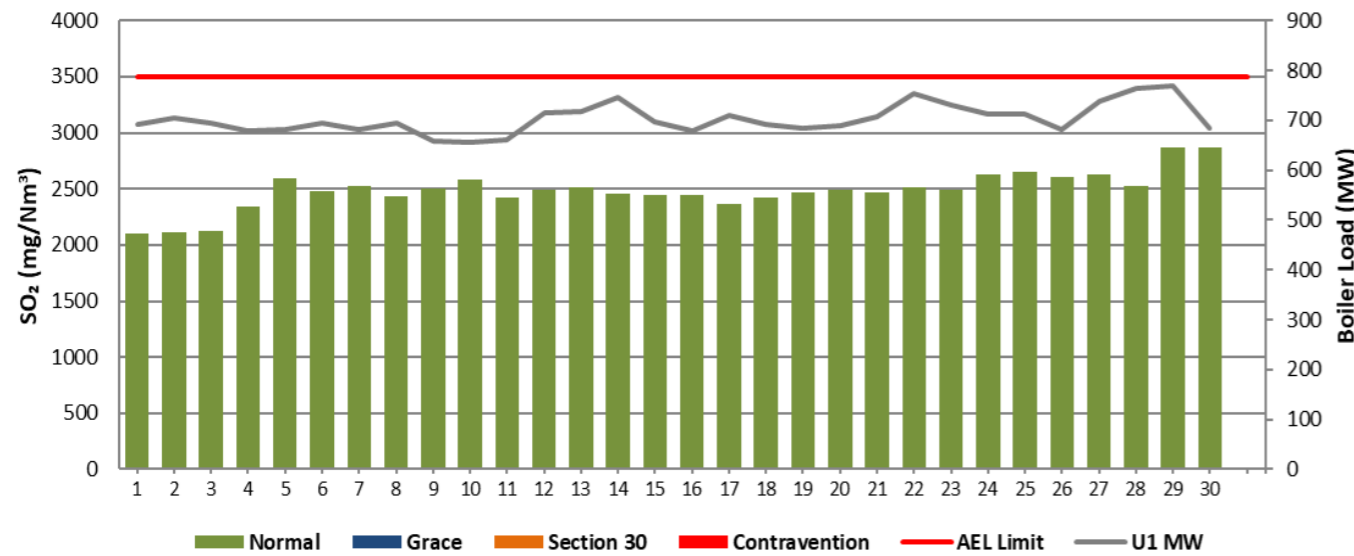
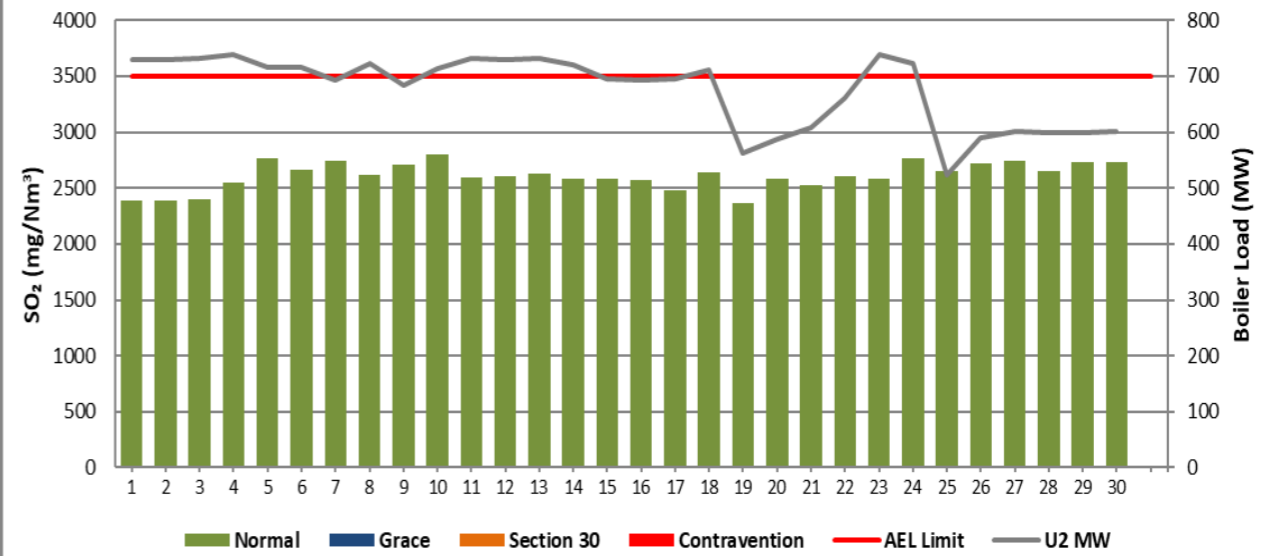


Figure 8: Medupi Unit 2 SO₂ Emissions - September 2023



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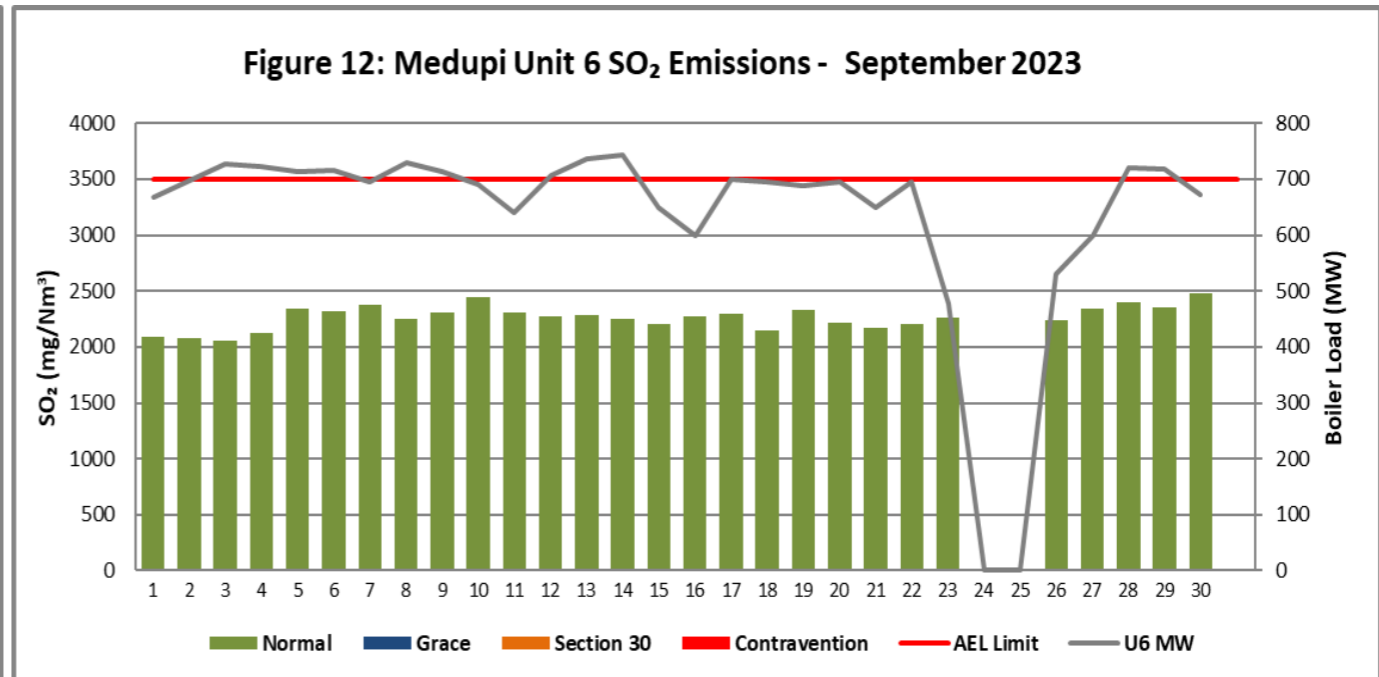
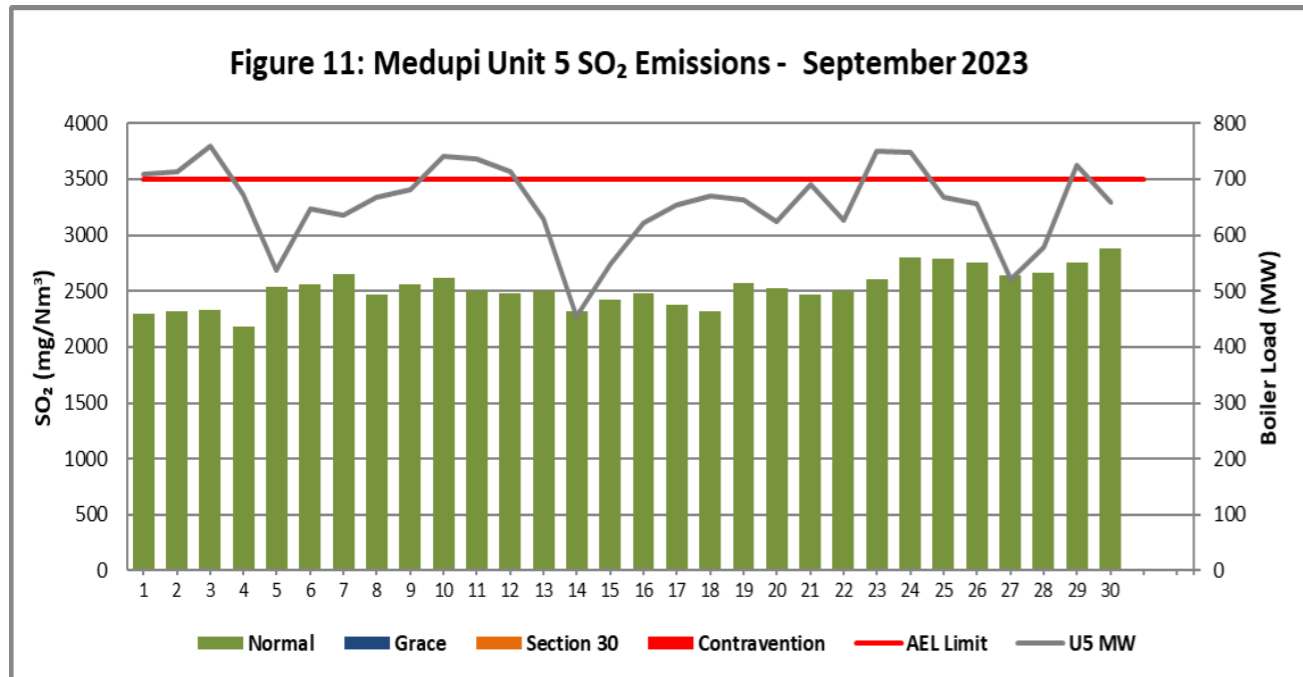
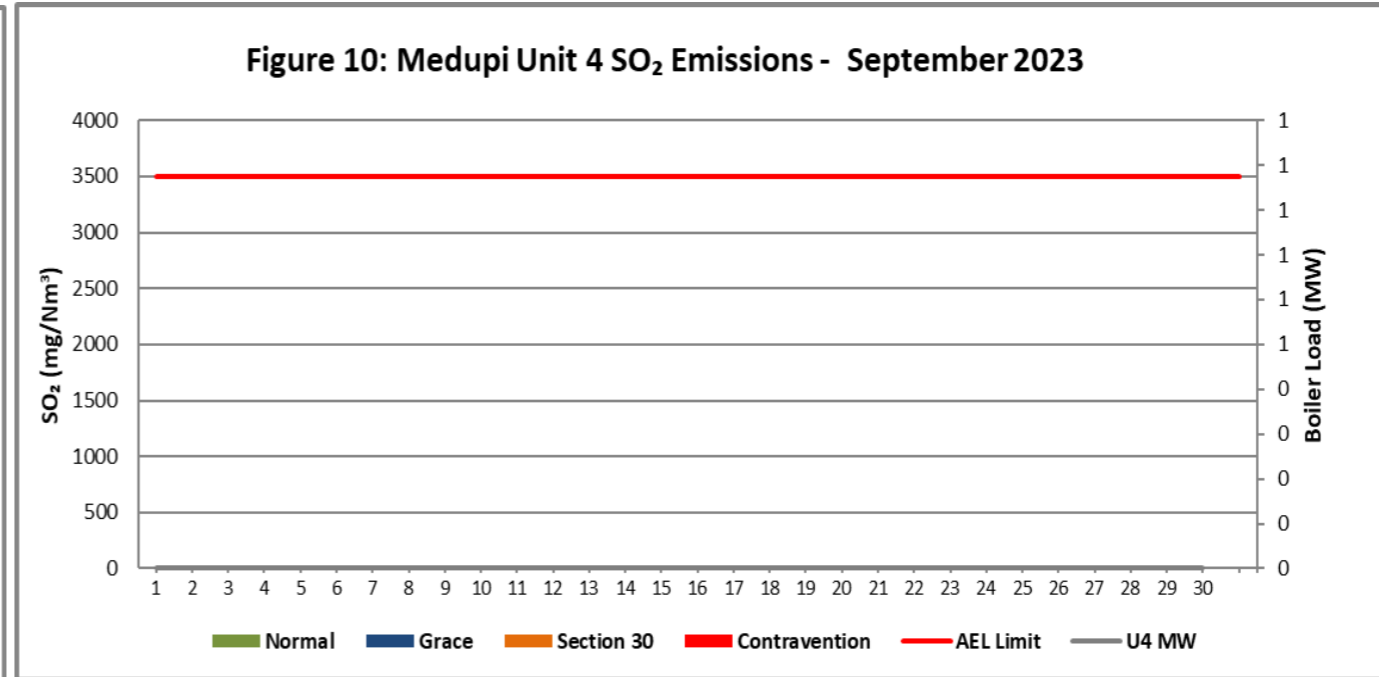
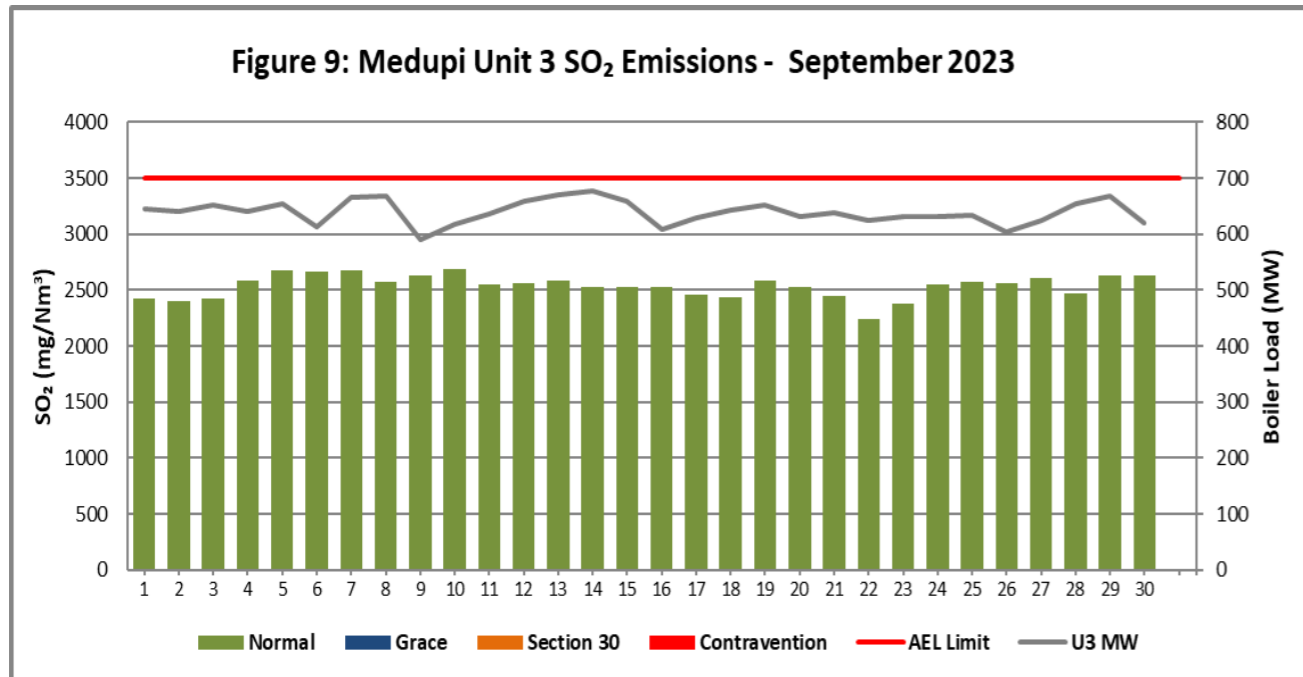
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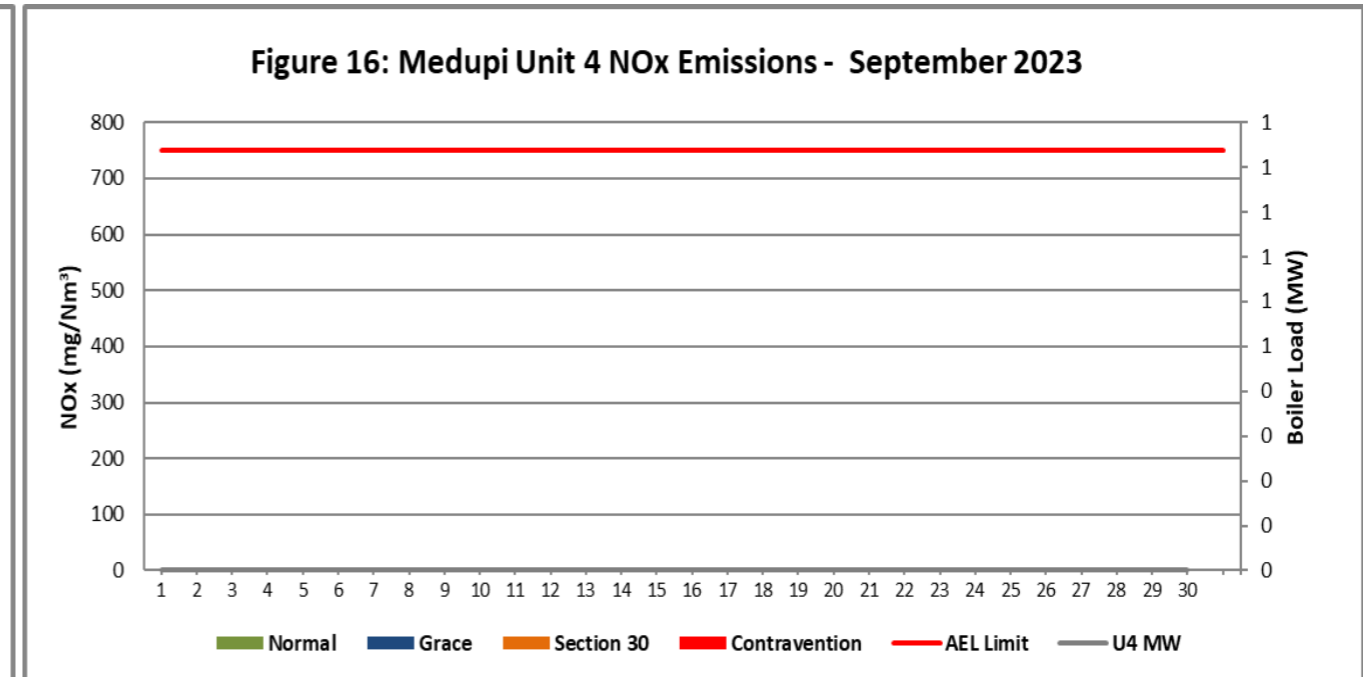
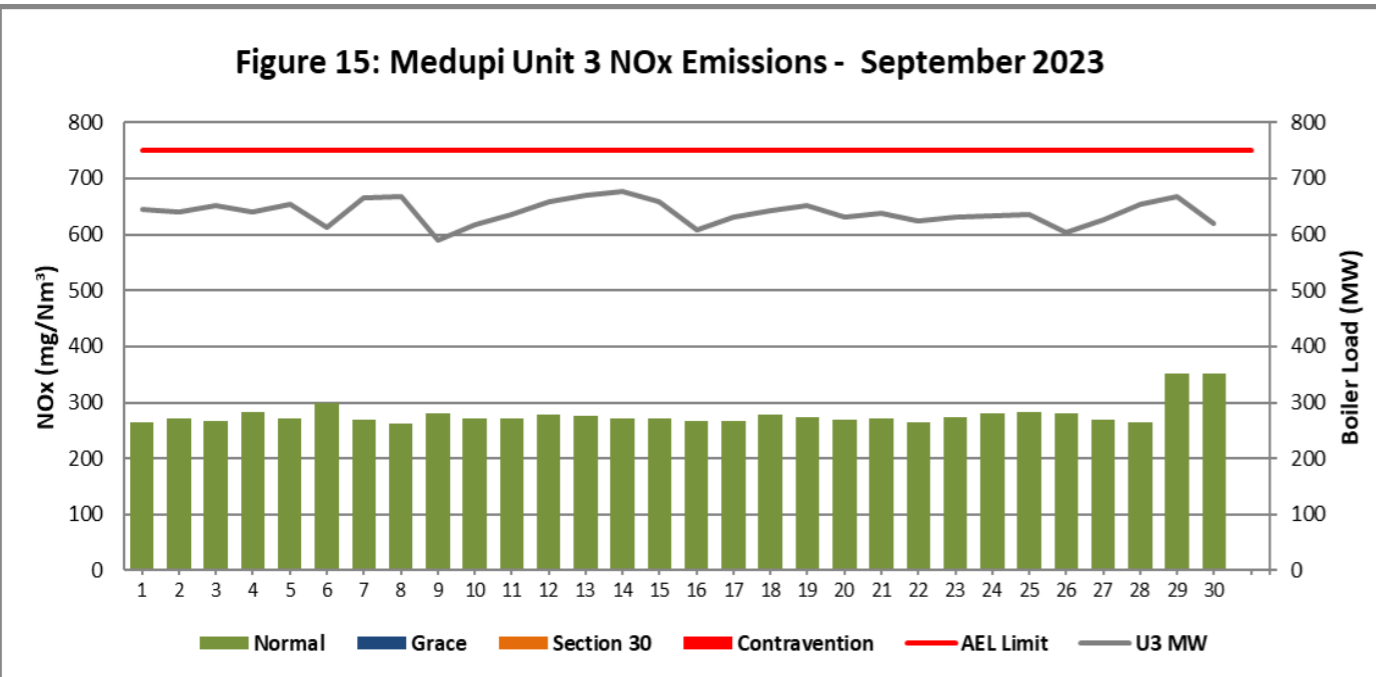
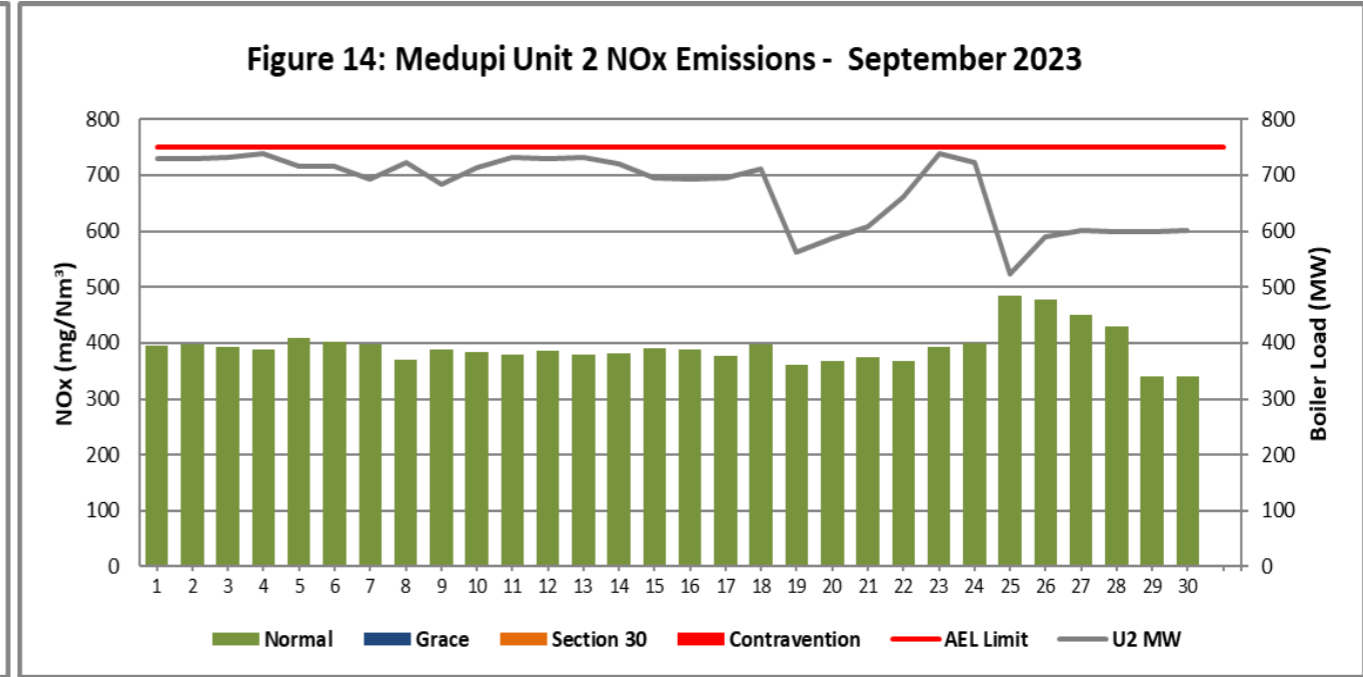
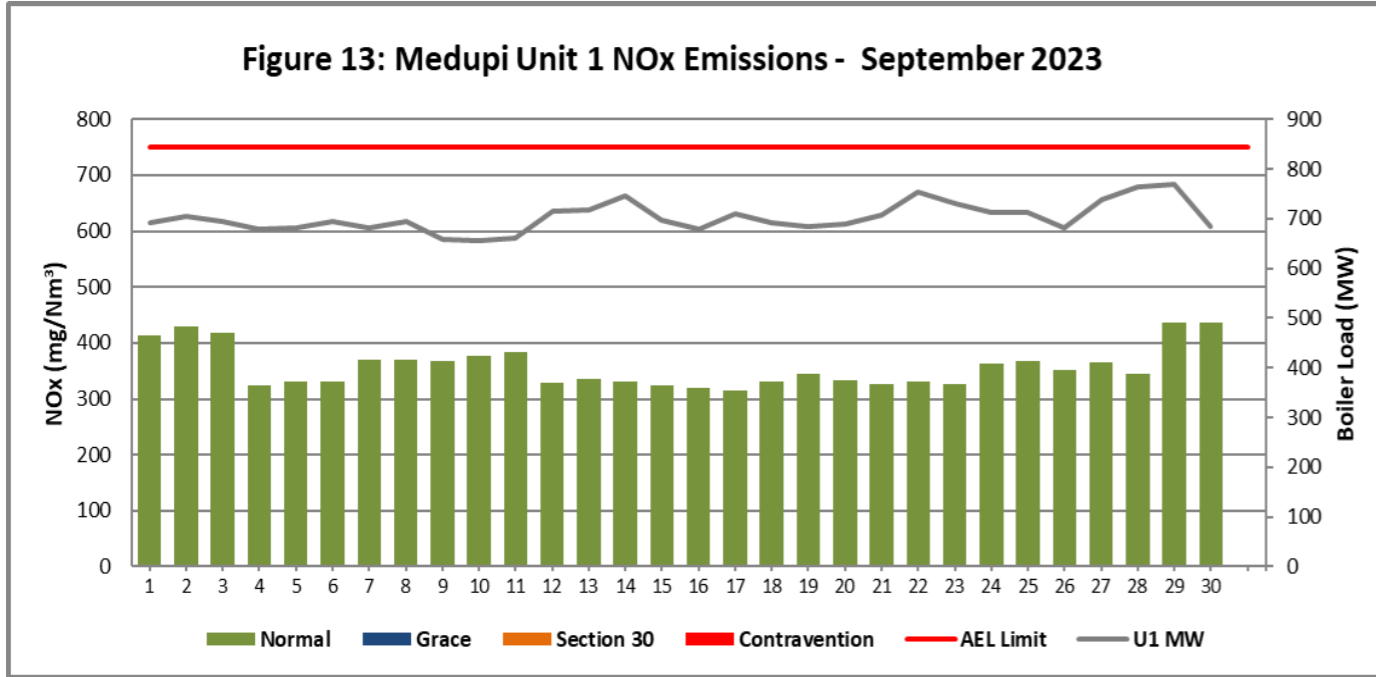
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4.3 NOx Daily Averages



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Figure 17: Medupi Unit 5 NOx Emissions - September 2023

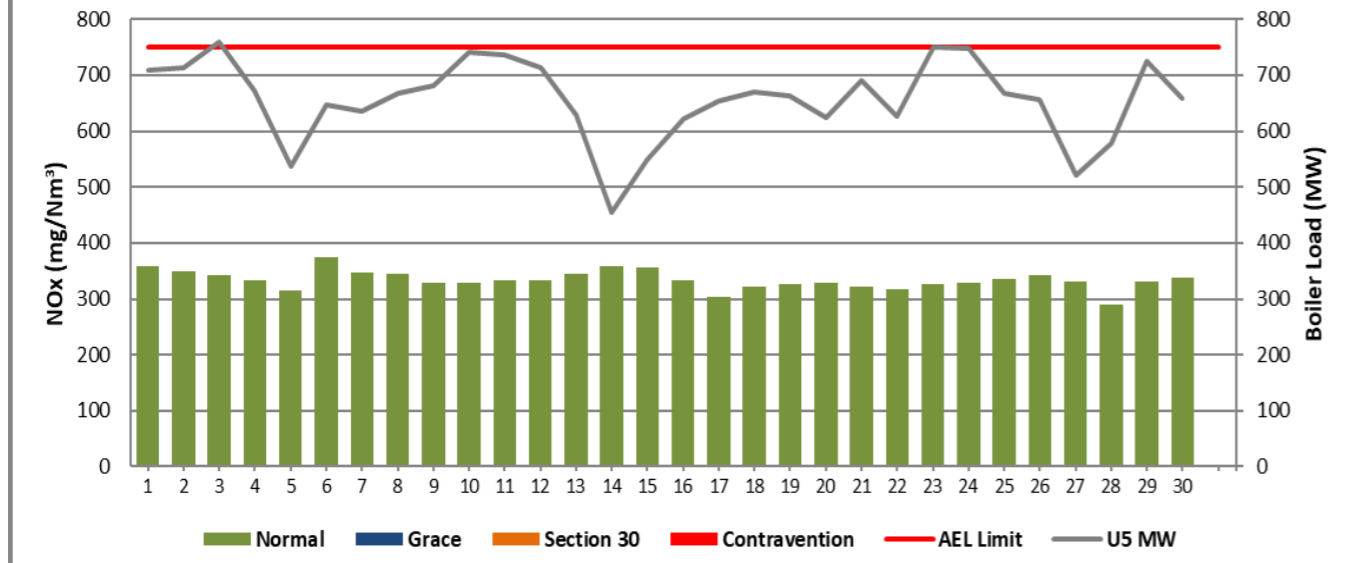
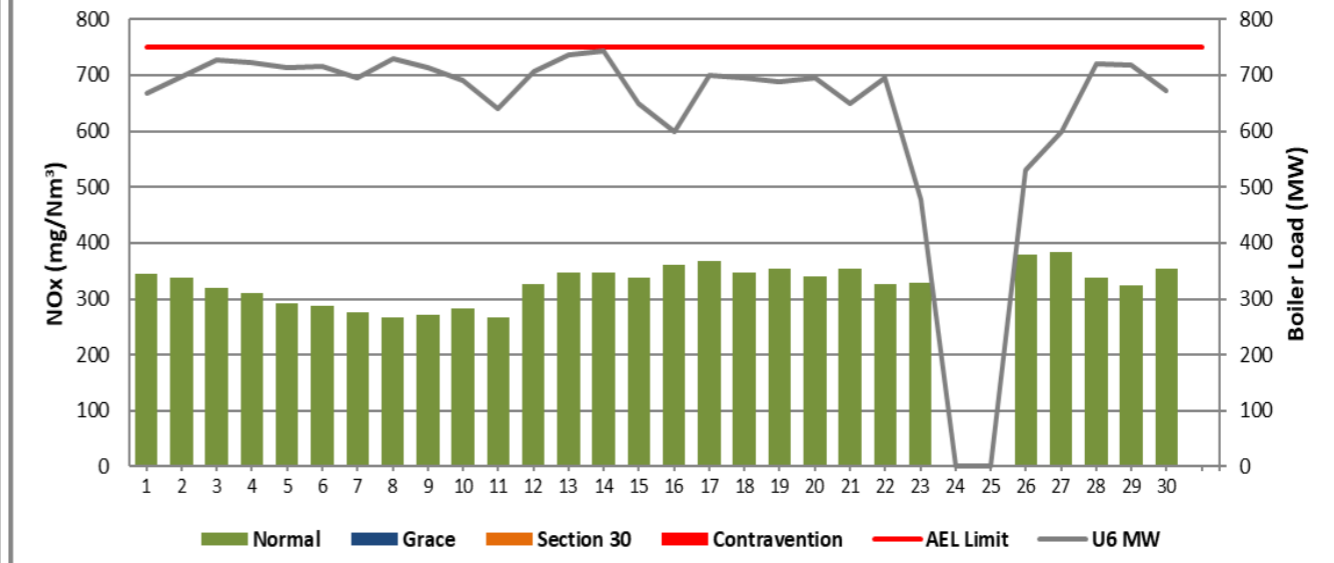


Figure 18: Medupi Unit 6 NOx Emissions - September 2023



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TABLE 6: MONTHLY TONNAGES FOR THE MONTH OF SEPTEMBER 2023

Associated Unit/Stack	PM	SO ₂	NO ₂
Unit 1	55.7	5 209.2	748.8
Unit 2	57.4	5 660.7	846.8
Unit 3	46.7	4 490.1	492.8
Unit 4	OFF	OFF	OFF
Unit 5	21.5	6 232.0	821.5
Unit 6	16.4	4 080.9	590.2
SUM (Tons)	197.8	25 672.9	3 500.0

TABLE 7: MONTHLY AVERAGES FOR THE MONTH OF SEPTEMBER 2023

Associated Unit/Stack	Average PM (mg/Nm ³)	Average SO _x (mg/Nm ³)	Average NO _x (mg/Nm ³)
Unit 1	26.5	2 485.2	357.5
Unit 2	28.1	2 612.7	392.8
Unit 3	27.3	2 537.3	278.3
Unit 4	OFF	OFF	OFF
Unit 5	9.2	2 528.6	334.0
Unit 6	9.5	2 264.9	327.6

4 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	96.7	96.7	96.7
Unit 2	100.0	97.4	97.4	97.1
Unit 3	100.0	0	0	0
Unit 4	off	off	off	off
Unit 5	100.0	99.8	99.8	99.8
Unit 6	100.0	96.4	96.3	92.9

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.

5 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.


6 Ambient Air Quality Monitoring Report

The Ambient Air Quality Monitoring and Dust fall-out report for September2023 was e-mailed to the Licensing Authority.

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7 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 SEPTEMBER 2023

		
CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS*		
Date:	Saturday, 30 September 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 blue cells below Choose from a dropdown menu in the green cells The total VOC emissions for the month are in the red cells IMPORTANT: Do not change any other cells without consulting the AQ CoE		
MONTH:	September	
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:	2257	tons/month
Molecular weight of the fuel oil:		Lb/lb-mole
METEROLOGICAL DATA FOR THE MONTH		
	Data	Unit
Daily average ambient temperature	23.43	°C
Daily maximum ambient temperature	31.06	°C
Daily minimum ambient temperature	16.52	°C
Daily ambient temperature range	14.54	°C
Daily total insolation factor	4.41	kWh/m ² /day
Tank paint colour	Aluminum/Specular	NA
Tank paint solar absorbance	0.39	NA
FINAL OUTPUT:		
	Result	Unit
Breathing losses:	0.69 kg/month	
Working losses:	0.06 kg/month	
TOTAL LOSSES (Total TVOC Emissions for the month):	0.76 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, Trittech 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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8 Air quality improvements initiatives and public education and awareness campaigns

On 22 September 2023, Tielelo Secondary School in Marapong Township was visited by the Medupi Team for an Air Quality Management Awareness and Education session. The target audiences were school teachers and Learners from Grade 8-12.

- Information shared on the day included the following.
- Electricity generation process from coal fired Power Stations
- Primary pollutants associated with coal fired Power Station (SO_x, NO_x, CO₂, PM, CO)
- Emissions Control Technologies
- Legal Requirements
- Consequences of non-compliance (penalties)
- Ways of reducing emissions within our daily lives including our homes.

9 Complaints Register

TABLE 5: COMPLAINTS FOR THE MONTH OF SEPTEMBER 2023


Source Code/ Name	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

Complaint received from DFFE 26 September 2023 stating that: "Compliance Directorate received a complaint from an anonymous complainant alleging ash pollution from Medupi and Matimba Power Station ash-dumps. According to the complainant, this has been happening for several months affecting the entire Onverwacht Township." Response letter is attached.

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Compiled by: Lutendo Murovhi  Date: 31 October 2023
Environmental Officer

Verified by: Malose Langa  Date: 2023/10/31
System Engineer Boiler


Verified by: Shu Mpangase  Date: 31 October 2023
System Engineer C&I

Supported by: Mokgadi Dikgale  Date: 31/10/2023
Environmental Manager

Supported by: Jabulani Mkhathshwa  Date: 2023/10/31
Engineering Group Manager

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

Yours sincerely


J.T. Antin
 Zweli Witbooi
GENERAL MANAGER: MEDUPI POWER STATION

Date: 2023-10-31

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