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		Review Date	February 2024			

Stanley Koenaitse

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Date: 2023/02/28

Enquiries: MF Dikgale

Tel: 014 762 6820

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

Dear Mr Koenaitse

MEDUPI POWER STATION MONTHLY EMISSIONS REPORT FOR THE MONTH OF FEBRUARY 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 is a reflection of Unit 1, 2, 3, 5 and 6 gaseous and particulate emissions performance against the AEL limit for the month of February 2023 only.

1. Raw Materials and Products

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

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption – February 2023
	Coal	Tons/month	1 875 000	737 455
	Fuel Oil	Tons/month	20 000	1 418
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Production Rate in Month of February 2023
	Energy	GWh	3 571.2	1 581.13
	Ash Emitted	Tons/month	not specified	207.0

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TABLE 2: DAILY CONSUMPTION AND PRODUCTION RATES


Date	Reportable hours of Operation						Coal usage	Production rate (MW)					
	U1	U2	U3	U4	U5	U6		U1	U2	U3	U4	U5	U6
01-Feb	18.8	24.0	24.0	OFF	24.0	OFF	27255	759	737	596	OFF	751	OFF
02-Feb	24.0	24.0	24.0	OFF	24.0	OFF	29073	736	750	602	OFF	742	OFF
03-Feb	24.0	24.0	24.0	OFF	24.0	OFF	28914	758	723	624	OFF	751	OFF
04-Feb	24.0	24.0	24.0	OFF	24.0	OFF	26351	645	666	582	OFF	668	OFF
05-Feb	24.0	24.0	24.0	OFF	24.0	OFF	27243	689	674	640	OFF	674	OFF
06-Feb	24.0	24.0	24.0	OFF	24.0	OFF	30734	685	742	672	OFF	748	OFF
07-Feb	24.0	24.0	24.0	OFF	24.0	OFF	28191	722	772	500	OFF	720	OFF
08-Feb	24.0	24.0	24.0	OFF	24.0	OFF	27382	633	755	559	OFF	691	OFF
09-Feb	19.6	24.0	24.0	OFF	24.0	OFF	28530	704	729	723	OFF	678	OFF
10-Feb	0	24.0	24.0	OFF	24.0	OFF	22850	0	756	743	OFF	718	OFF
11-Feb	0	24.0	24.0	OFF	24.0	OFF	21490	0	700	743	OFF	704	OFF
12-Feb	0	24.0	24.0	OFF	24.0	OFF	22228	0	700	718	OFF	704	OFF
13-Feb	0	24.0	24.0	OFF	24.0	OFF	23421	140	753	763	OFF	688	OFF
14-Feb	0	24.0	24.0	OFF	24.0	OFF	28657	627	758	687	OFF	728	OFF
15-Feb	19.9	24.0	24.0	OFF	24.0	OFF	29973	741	753	678	OFF	699	OFF
16-Feb	24.0	24.0	24.0	OFF	24.0	OFF	30039	732	761	671	OFF	691	OFF
17-Feb	24.0	24.0	21.8	OFF	24.0	OFF	29534	748	741	667	OFF	670	OFF
18-Feb	24.0	24.0	0	OFF	24.0	OFF	23596	717	755	0	OFF	712	OFF
19-Feb	24.0	24.0	0	OFF	24.0	OFF	22568	715	735	0	OFF	698	OFF
20-Feb	24.0	24.0	0	OFF	4.8	OFF	18639	701	769	0	OFF	458	OFF
21-Feb	24.0	24.0	0	OFF	10.0	OFF	22427	706	753	0	OFF	644	OFF
22-Feb	24.0	24.0	0	OFF	24.0	OFF	25473	683	718	304	OFF	678	OFF
23-Feb	24.0	24.0	13.3	OFF	24.0	OFF	29565	733	758	646	OFF	698	OFF
24-Feb	24.0	22.4	24.0	OFF	21.9	OFF	28324	634	740	595	OFF	691	OFF
25-Feb	24.0	1.3	24.0	OFF	0	OFF	21287	607	746	579	OFF	0	OFF
26-Feb	24.0	24.0	24.0	OFF	0	OFF	26035	619	652	606	OFF	561	OFF
27-Feb	24.0	24.0	24.0	OFF	21.8	OFF	28513	684	684	613	OFF	656	OFF
28-Feb	24.0	24.0	24.0	OFF	24.0	OFF	29163	647	782	573	OFF	682	OFF

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

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2. Abatement Technology

Table 3: Abatement Equipment Control Technology efficiency for month of February 2023

Associated Unit/Stack	Technology Type	Efficiency	FFP Utilization
Unit 1	Fabric Filter Plant (FFP)	99.87%	100%
Unit 2	Fabric Filter Plant (FFP)	99.96%	100%
Unit 3	Fabric Filter Plant (FFP)	99.86%	100%
Unit 4	Fabric Filter Plant (FFP)	Off	Off
Unit 5	Fabric Filter Plant (FFP)	99.92%	100%
Unit 6	Fabric Filter Plant (FFP)	Off	Off

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

3. Energy Source Characteristics

TABLE 4: ENERGY SOURCE MATERIAL CHARACTERISTICS FOR THE MONTH OF FEBRUARY 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	1.4
Ash Content	35 - 39	34.8

TABLE 5: ENERGY SOURCE MATERIAL CHARACTERISTICS FOR THE MONTH OF FEBRUARY 2023

Characteristic	Stipulated Range (%)	Monthly Average Content (%)
Oil		
Sulphur Content	0.5 - 3.5	2.45
Ash Content	0.02 - 0.1	0.0375

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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4.1 PM Daily Averages

Figure 1: Medupi Unit 1 PM Emissions

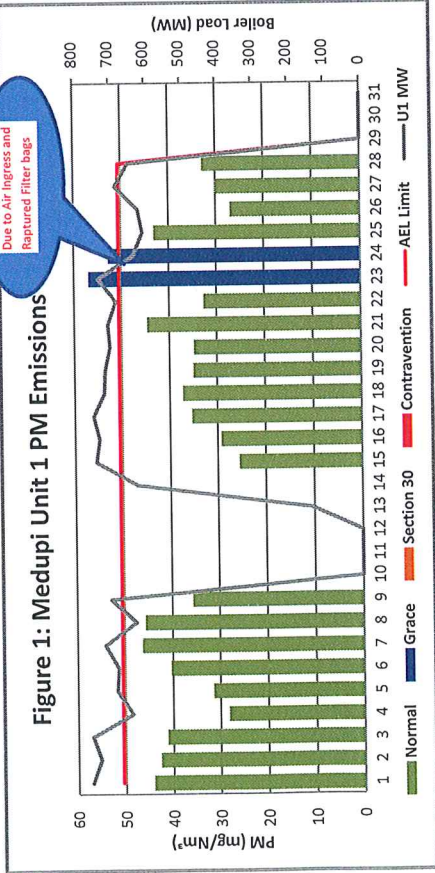


Figure 2: Medupi Unit 2 PM Emissions - February 2023

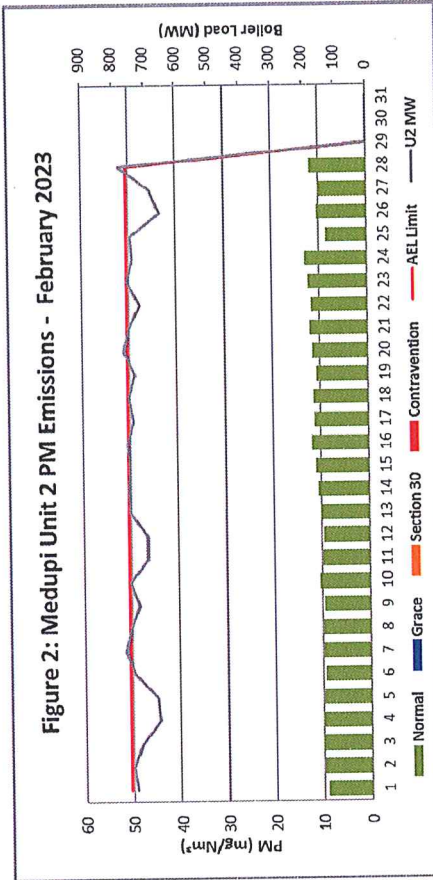


Figure 3: Medupi Unit 3 PM Emissions - February 2023

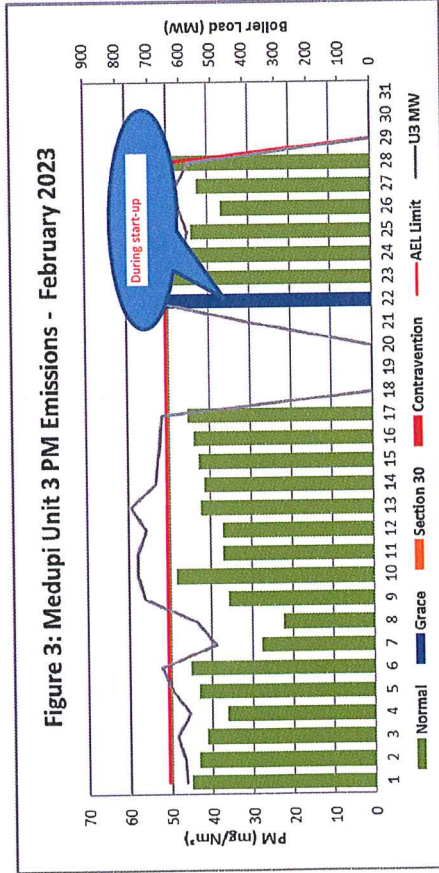
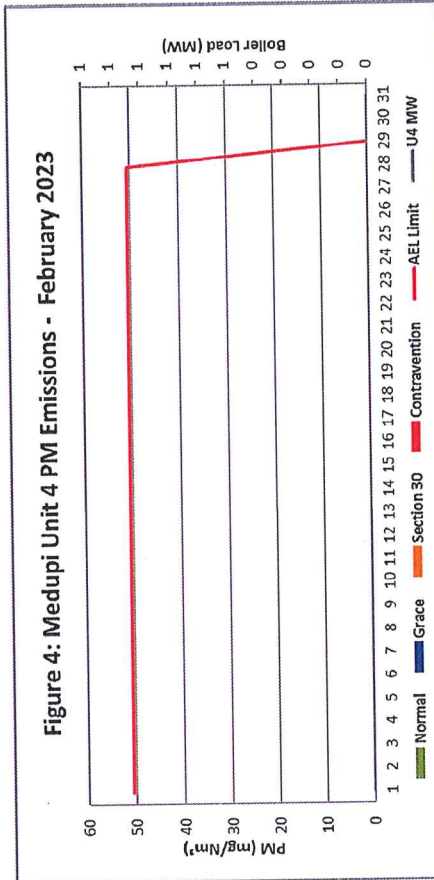


Figure 4: Medupi Unit 4 PM Emissions - February 2023



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Figure 5: Medupi Unit 5 PM Emissions - February 2023

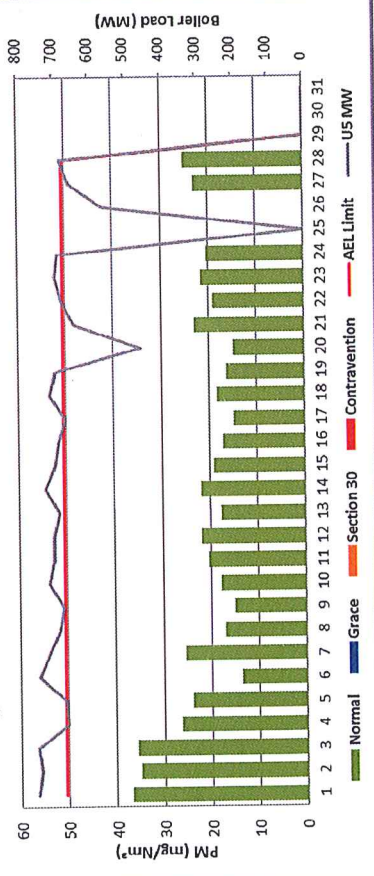


Figure 6: Medupi Unit 6 PM Emissions - February 2023

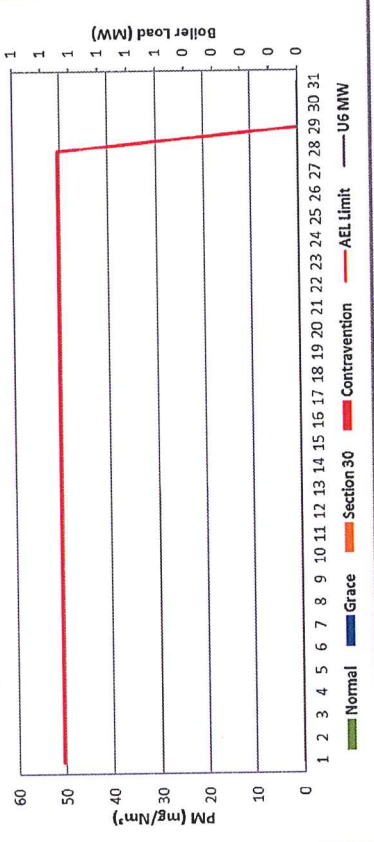


Figure 7: Medupi Unit 1 SOx Emissions - February 2023

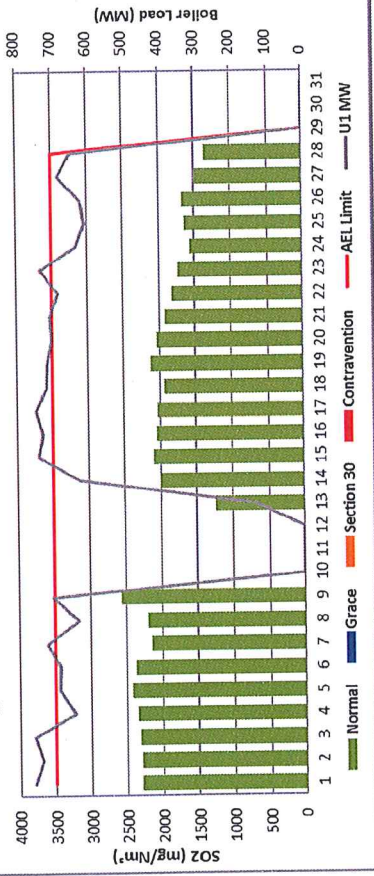
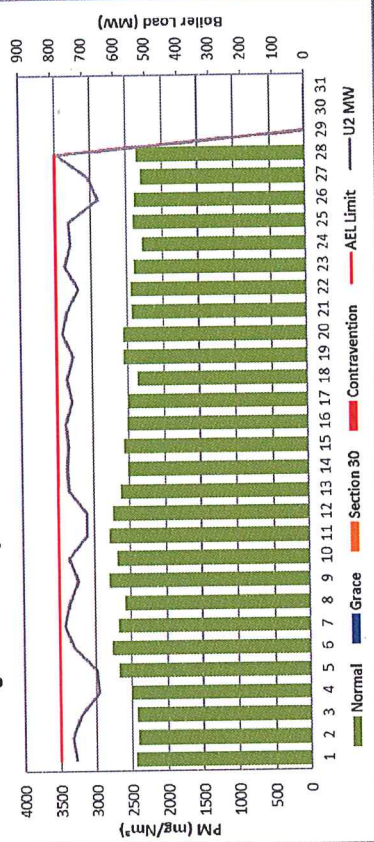


Figure 8: Medupi Unit 2 SOx Emissions - February 2023



4.2 SOx Daily Averages

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Figure 9: Medupi Unit 3 SOx Emissions - February 2023

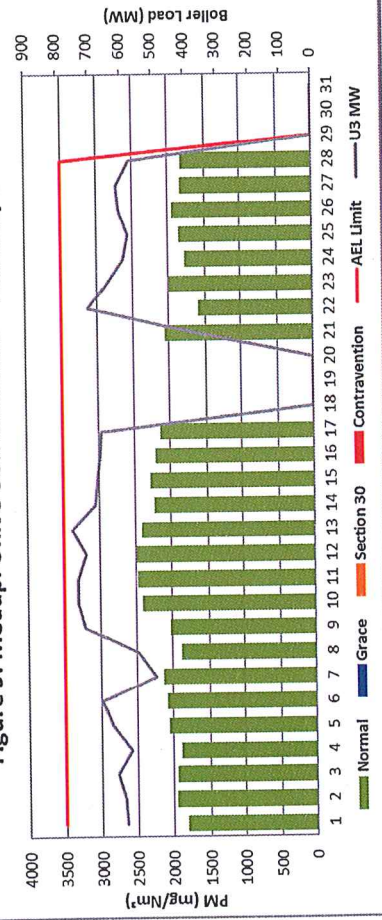


Figure 10: Medupi Unit 4 SOx Emissions - February 2023

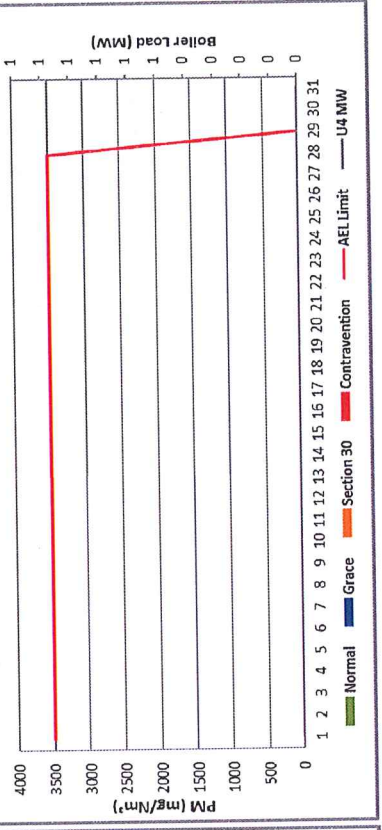


Figure 11: Medupi Unit 5 SOx Emissions - February 2023

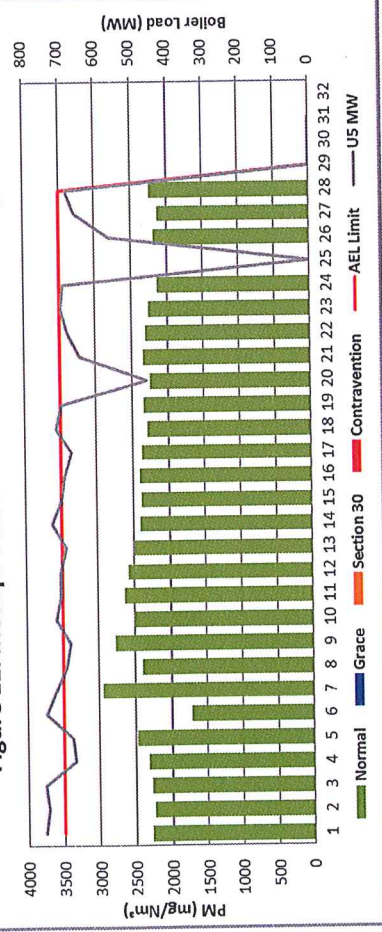
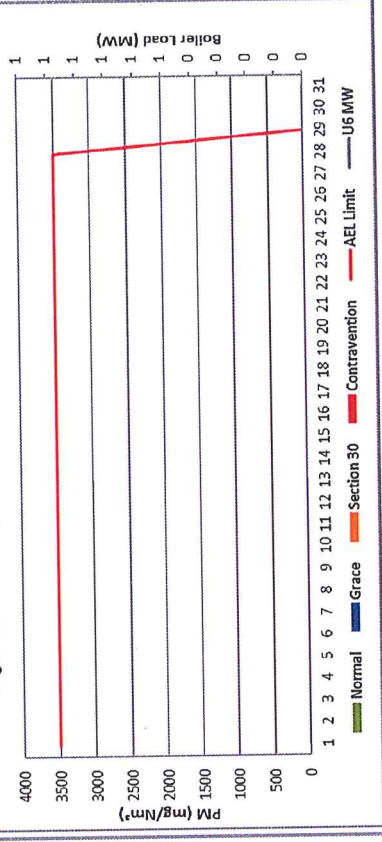


Figure 12: Medupi Unit 6 SOx Emissions - February 2023



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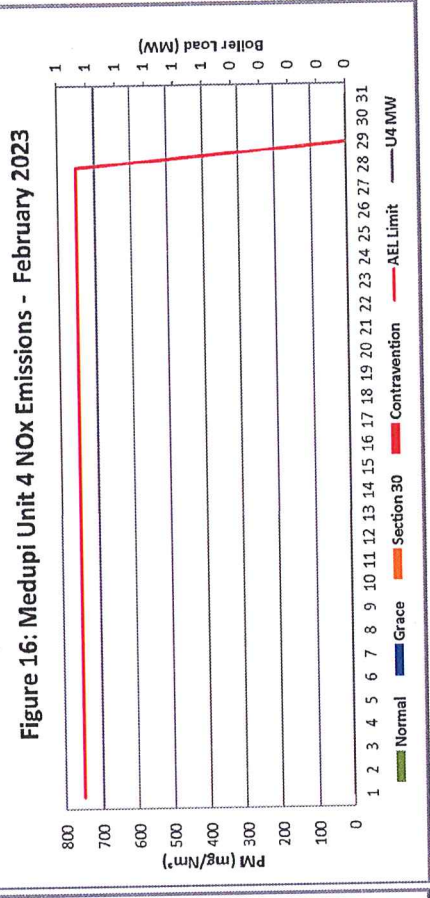
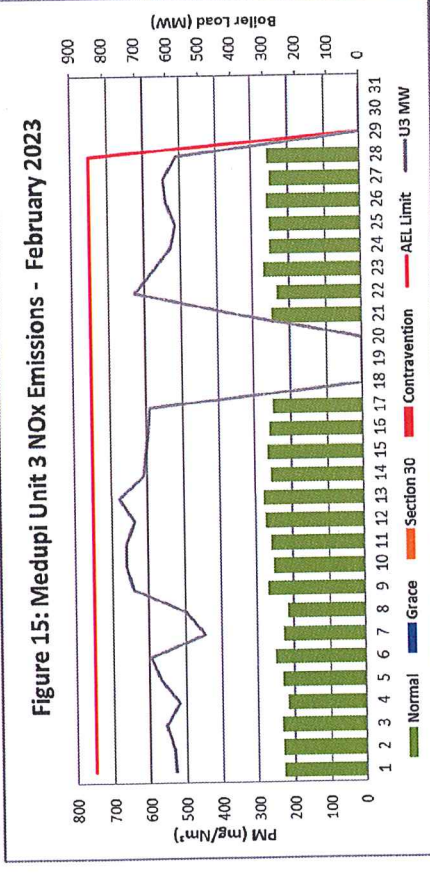
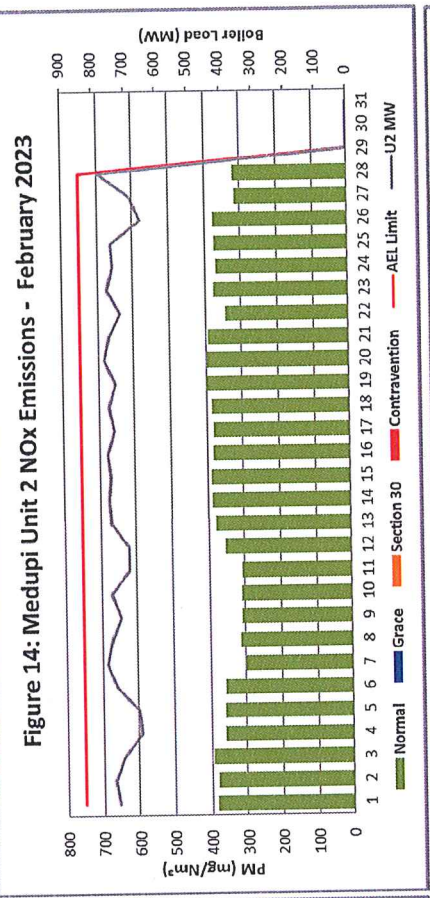
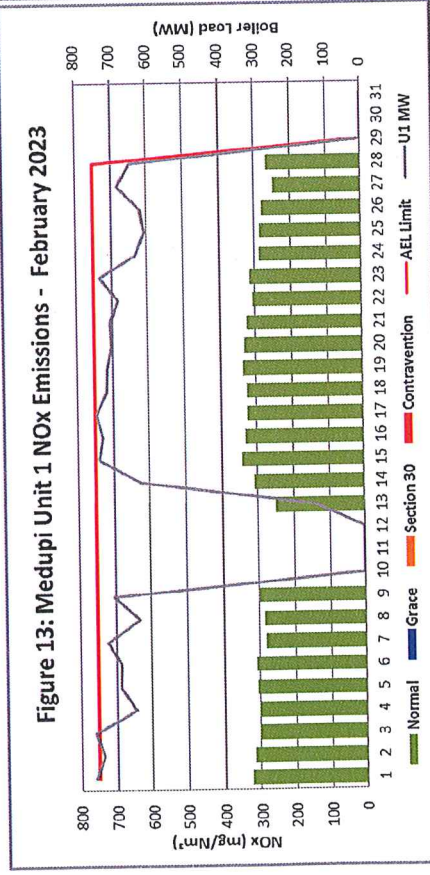
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4.3 NOx Daily Averages



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Figure 17: Medupi Unit 5 NOx Emissions - February 2023

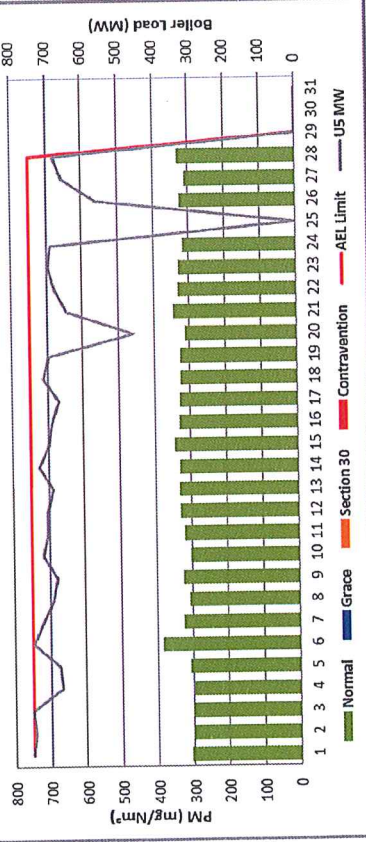
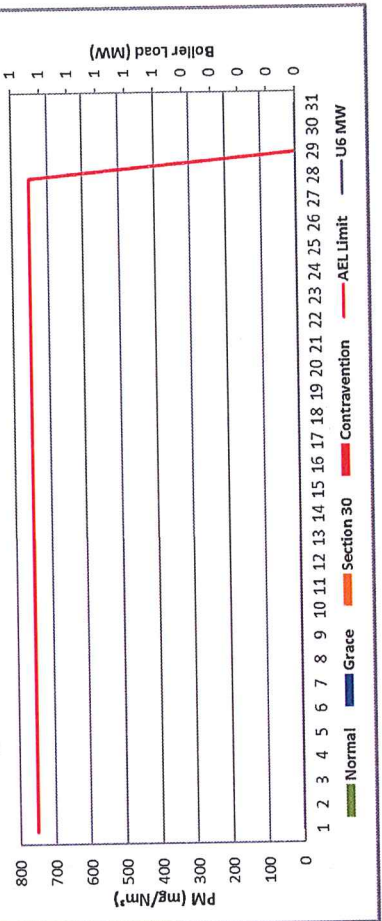


Figure 18: Medupi Unit 6 NOx Emissions - February 2023



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TABLE 6: MONTHLY TONNAGES FOR THE MONTH OF FEBRUARY 2023

Associated Unit/Stack	PM	SO ₂	NO ₂
Unit 1	65.1	3 642.7	556.1
Unit 2	26.8	6 585.1	939.3
Unit 3	70.0	3 682.8	444.7
Unit 4	0.0	0.0	0.0
Unit 5	45.1	5 177.9	712.0
Unit 6	0.0	0.0	0.0
SUM	207.0	19 088.6	2 652.0

TABLE 7: MONTHLY AVERAGES FOR THE MONTH OF FEBRUARY 2023

Associated Unit/Stack	Average PM (mg/Nm ³)	Average SO _x (mg/Nm ³)	Average NO _x (mg/Nm ³)
Unit 1	38.0	1 988.2	304.5
Unit 2	10.6	2 533.3	361.3
Unit 3	42.9	2 052.0	249.3
Unit 4	Unit Off	Unit Off	Unit Off
Unit 5	20.8	2 356.3	325.0
Unit 6	Unit Off	Unit Off	Unit Off

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. For days where the CEMS were readings incorrectly are indicated on the performance graphs above.

TABLE 8: PERIODS DURING WHICH CEMS WAS INOPERATIVE

Date	CEMS status	Comments
23-24 February 2023	Low monitor reliability	Unit 1 PM monitor reliability

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TABLE 9: CEMS MONITOR RELIABILITY PERCENTAGE (%)

Associated Unit/Stack	PM	SO ₂	NO ₂	CO ₂	O ₂
Unit 1	100.0	100.0	100.0	92.0	92.0
Unit 2	100.0	99.4	99.4	99.4	99.4
Unit 3	99.8	92.3	91.7	100.0	100.0
Unit 4	Off	off	off	off	off
Unit 5	100.0	99.3	95.3	97.9	97.5
Unit 6	Off	off	off	off	off

Note: The gas monitor analyser reliability on Units 1, 3 and 5, for CO₂ and O₂ was below the 90% target and in some instances, it was zero percent reliable for the month of February 2023. Manual inputs were made in the emissions reporting tool was to ensure more accurate reporting.

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 February 2023 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 FEBRUARY 2023

		
CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS*		
Date:	Tuesday, 28 February 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:	February	
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:	1418	tons/month
Molecular weight of the fuel oil:	166.00	Lb/lb-mole
METEROLOGICAL DATA FOR THE MONTH		
	Data	Unit
Daily average ambient temperature	26.20	°C
Daily maximum ambient temperature	32.94	°C
Daily minimum ambient temperature	20.71	°C
Daily ambient temperature range	12.24	°C
Daily total insolation factor	5.72	kWh/m ² /day
Tank paint colour	Aluminum/Specular	NA
Tank paint solar absorbance	0.39	NA
FINAL OUTPUT:		
	Result	Unit
Breathing losses:	0.70 kg/month	
Working losses:	0.04 kg/month	
TOTAL LOSSES (Total TVOC Emissions for the month):	0.74 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

No awareness campaigns for this month.

9 Complaints Register


TABLE 6: COMPLAINTS FOR THE MONTH OF FEBRUARY 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
N/A	No complaints received	N/A	N/A	N/A	N/A

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Compiled by: Thabo Khoza  Date: 12 April 2023
Senior Environmental Advisor

Verified by: Malose Langa  Date: 2023/04/12
System Engineer Boiler

Verified by: Kevin Mathebula  Date: 2023-04-12
System Engineer C&I

Supported by: Mokgadi Dikgale  Date: 2023/04/12
Environmental Manager

Supported by: Jabulani Mkhathswa  Date: 2023/04/12
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: 2023/04/12

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