

Template Identifier	240-43921804	Rev	6
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Effective Date	April 2022		
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Date: 2023/04/30

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Ref: H16/1/13-AEL/M1/R1 - April 2023

Dear Mr Koenaite

# MEDUPI POWER STATION MONTHLY EMISSIONS REPORT FOR THE MONTH OF APRIL 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 supersedes the report that was sent to the Department May 2023, the report was revised due to findings from the Eskom Data Integrity review Audit of FY2023.

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

#### Raw Materials and Products

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

Raw Materials and Products	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Consumption – April 2023
used	Coal	Tons/month	1 875 000	962 039.0
4004	Fuel Oil	Tons/month	20 000	3000
Production Rates	Product/ By- Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Production Rate in Month of April 2023
	Energy	GWh	3 571.2	1973.11
	Ash Emitted	Tons/month	not specified	223.0

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	R	eportal	ole hour	s of O	peratio	n	Coal	Production rate (MW)					
Date	U1	U2	U3	U4	U5	U6	usage	U1	U2	U3	U4	U5	U6
01-April	24.0	24.0	24.0	0.0	24.0	0.0	35676	767	788	722	Off	653	570
02-April	24.0	24.0	24.0	0.0	24.0	0.0	32930	697	783	750	Off	614	385
03-April	24.0	24.0	24.0	0.0	24.0	0.0	29707	607	779	703	Off	629	Off
04-April	24.0	24.0	24.0	0.0	24.0	0.0	31083	737	794	742	Off	644	Off
05-April	24.0	24.0	24.0	0.0	24.0	0.0	31852	769	792	750	Off	661	Off
06-April	24.0	24.0	24.0	0.0	24.0	0.0	31365	749	787	743	Off	642	Off
07-April	24.0	24.0	24.0	0.0	24.0	0.0	29697	736	612	747	Off	646	94
08-April	24.0	24.0	24.0	0.0	24.0	0.0	29997	705	685	713	Off	648	539
09-April	24.0	24.0	24.0	0.0	24.0	0.0	31239	721	774	706	Off	644	Off
10-April	24.0	24.0	24.0	0.0	24.0	0.0	29416	673	729	713	Off	646	Off
11-April	24.0	24.0	24.0	0.0	24.0	0.0	29156	736	730	682	Off	673	Off
12-April	24.0	24.0	24.0	0.0	23.6	0.0	29800	739	794	683	Off	627	Off
13-April	24.0	24.0	24.0	0.0	0.0	0.0	23894	702	773	695	Off	off	Off
14-April	24.0	24.0	24.0	0.0	0.0	0.0	24869	729	734	746	Off	Off	Off
15-April	24.0	24.0	24.0	0.0	0.0	0.0	25383	714	741	746	Off	off	Off
16-April	24.0	24.0	24.0	0.0	0.0	0.0	25088	736	702	750	Off	261	Off
17-April	24.0	24.0	24.0	0.0	13.4	0.0	29761	729	707	703	Off	486	229
18-April	24.0	24.0	24.0	0.0	24.0	10.8	34298	740	723	744	Off	579	429
19-April	24.0	24.0	24.0	0.0	24.0	24.0	36996	728	732	750	Off	640	588
20-April	24.0	24.0	24.0	0.0	24.0	10.8	35803	691	722	750	Off	703	573
21-April	24.0	24.0	24.0	0.0	24.0	3.2	36923	657	728	709	Off	586	723
22-April	24.0	24.0	24.0	0.0	24.0	24.0	38612	659	694	750	Off	625	726
23-April	24.0	24.0	24.0	0.0	24.0	24.0	37368	558	718	710	Off	646	692
24-April	24.0	24.0	24.0	0.0	24.0	7.8	36634	697	723	696	Off	669	606
25-April	24.0	24.0	22.0	0.0	24.0	6.7	38058	740	726	716	Off	693	635
26-April	24.0	24.0	0.0	0.0	24.0	23.3	35077	762	757	483	Off	650	662
27-April	24.0	24.0	16.4	0.0	24.0	0.0	33322	648	727	575	Off	656	521
28-April	21.7	24.0	24.0	0.0	24.0	13.5	35951	642	720	610	Off	649	670
29-April	0.0	24.0	24.0	0.0	24.0	24.0	30309	off	720	735	Off	650	718
30-April	0.0	23.9	23.9	0.0	23.9	23.9	31775	443	697	720	Off	623	718

NB: Reportable 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 April 2023

Associated Unit/Stack	Technology Type	Efficiency	FFP Utilization
Unit 1	Fabric Filter Plant (FFP)	99.889%	100%
Unit 2	Fabric Filter Plant (FFP)	99.974%	100%
Unit 3	Fabric Filter Plant (FFP)	99.910%	100%
Unit 4	Fabric Filter Plant (FFP)	Off	Off
Unit 5	Fabric Filter Plant (FFP)	99.904%	100%
Unit 6	Fabric Filter Plant (FFP)	99.991%	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 APRIL 2023

Characteristic	Stipulated Range Monthly Average Content (% by weight on a dry basis) (% by weight on a dry basis)			
	Coal			
Sulphur Content	1.3 - 2.2			
Ash Content	35 - 39	35.67		

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

Characteristic	Stipulated Range (%)	Monthly Average Content (%)		
	Oil			
Sulphur Content	0.5 - 3.5	2.35		
Ash Content	0.02 - 0.1	0.025		

# 4. Emissions Reporting

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

The emission limits are as follows:

 $SO_2$  Monthly = 3500 mg/Nm<sup>3</sup> Dust Daily= 50 mg/Nm<sup>3</sup> NO<sub>2</sub> Daily= 750 mg/Nm<sup>3</sup>

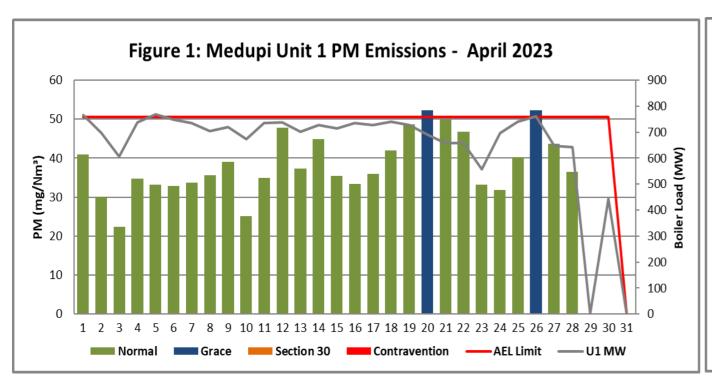
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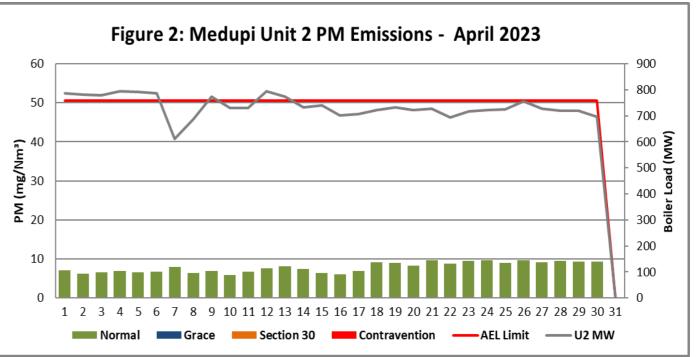
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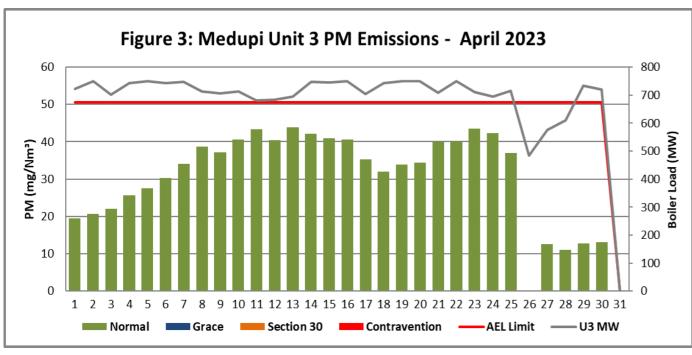


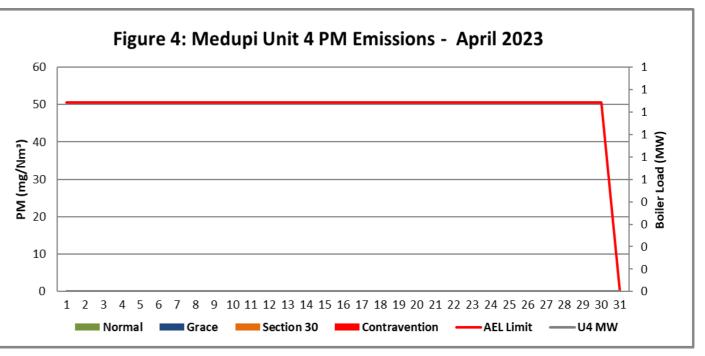
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## 4.1 PM Daily Averages



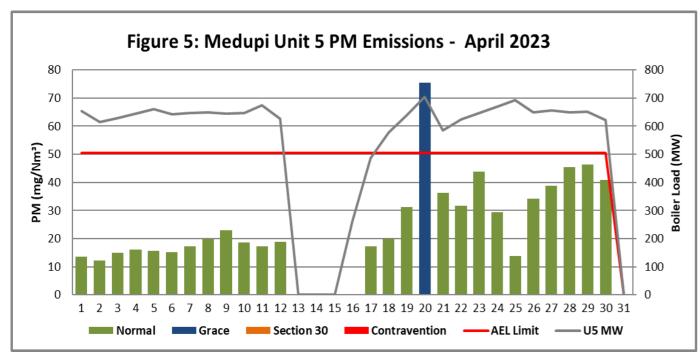


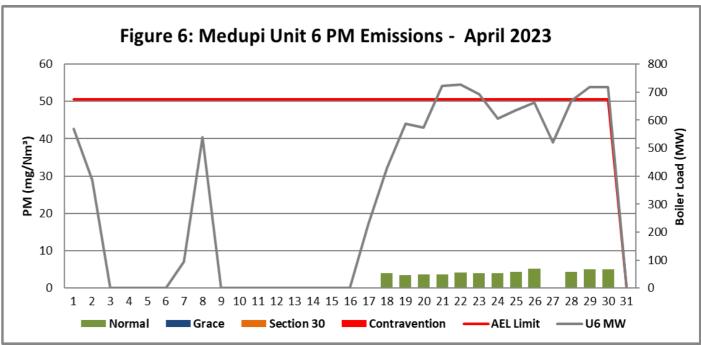




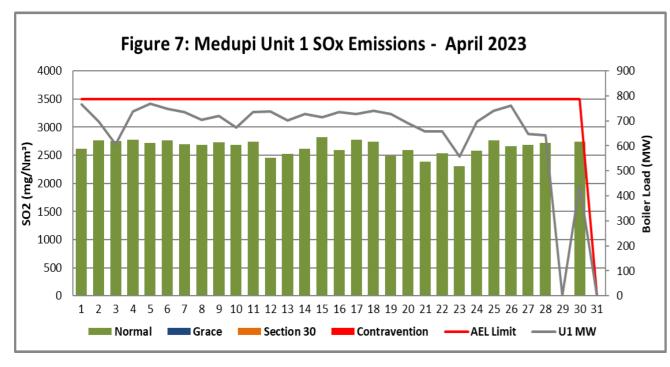


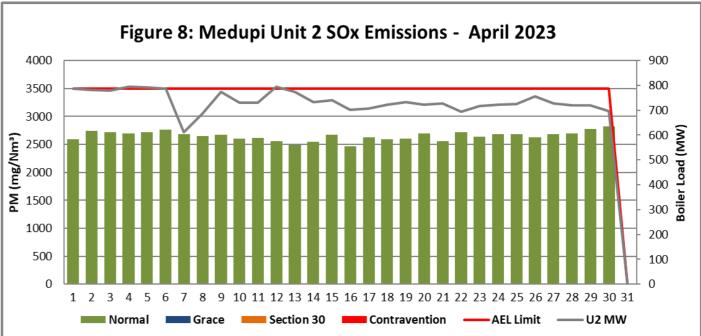
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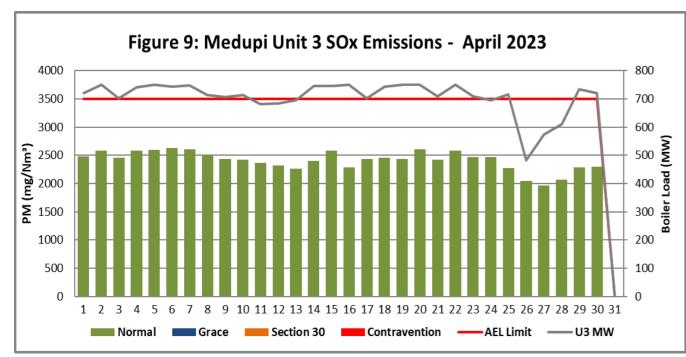
## 4.2 SOx Daily Averages

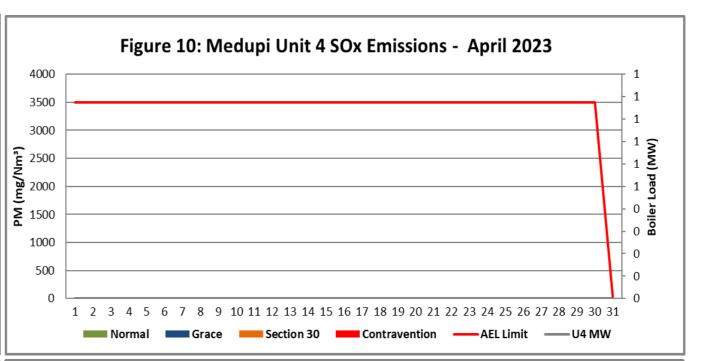


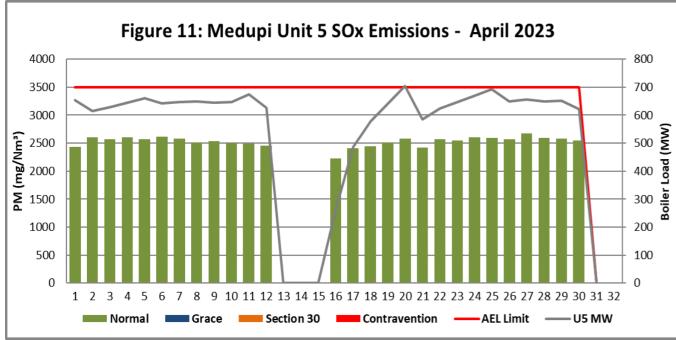


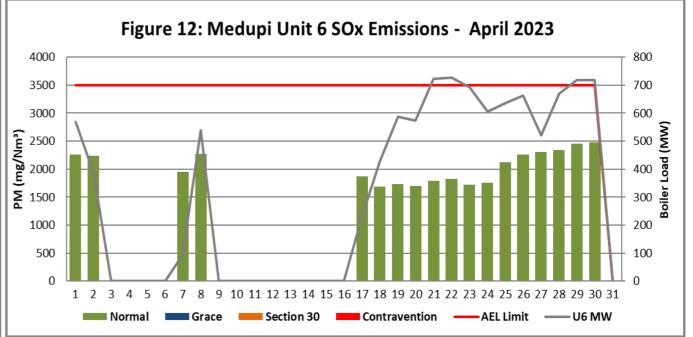


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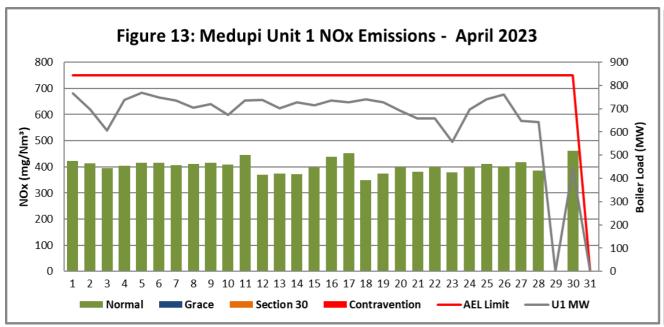


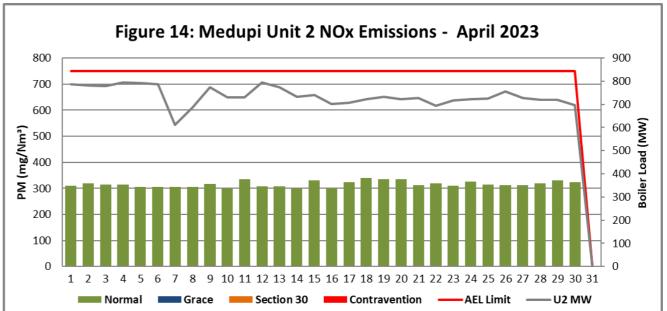


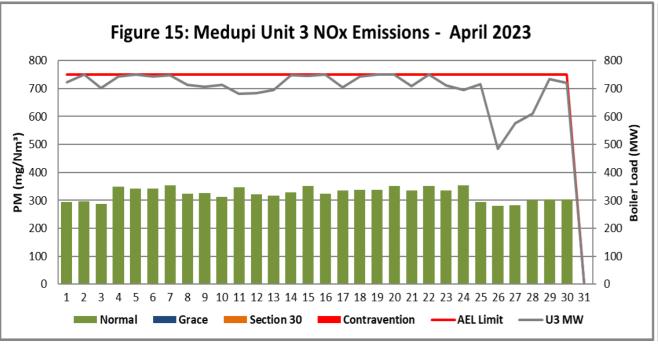


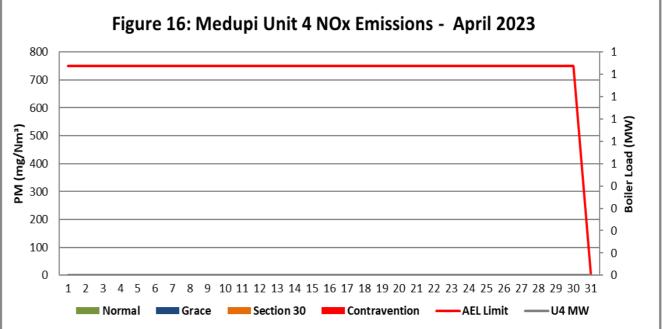
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## 4.3 NOx Daily Averages



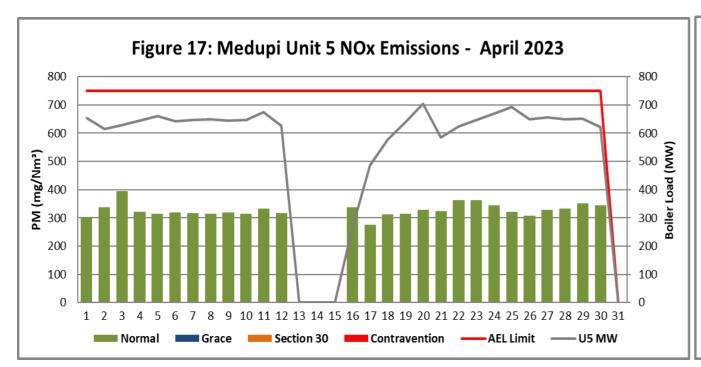


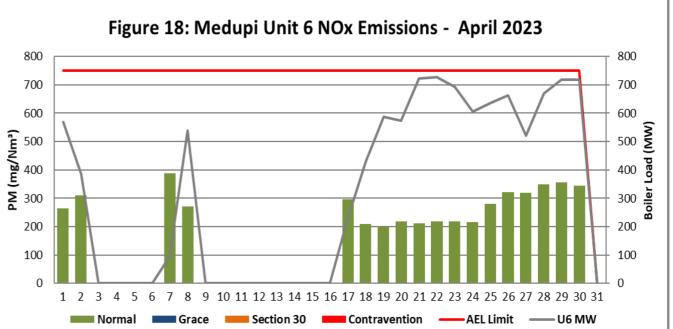


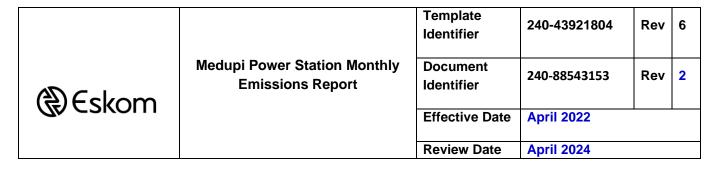




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#### Table 6: Monthly tonnages for the month of April 2023

Associated Unit/Stack	РМ	SO <sub>2</sub>	NO <sub>2</sub>
Unit 1	79.1	5 502.3	836.6
Unit 2	20.7	6 968.7	831.5
Unit 3	66.2	5 116.1	686.8
Unit 4	off	off	off
Unit 5	54.4	5 169.0	667.2
Unit 6	2.6	1 980.6	260.0
SUM (Tons)	223.0	24 736.7	3 282.1

#### **TABLE 7: MONTHLY AVERAGES FOR THE MONTH OF APRIL 2023**

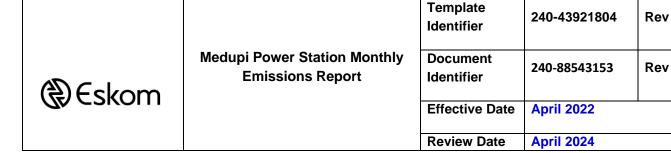
Associated Unit/Stack	Average PM (mg/Nm³)	Average SOx (mg/Nm³)	Average NOx (mg/Nm³)
Unit 1	38.4	2 651.4	403.9
Unit 2	7.9	2 653.0	316.6
Unit 3	32.3	2 411.1	323.7
Unit 4	off	off	off
Unit 5	27.2	2 530.4	327.8
Unit 6	4.3	2 043.4	277.2

# 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.
- Investigations indicates that the exceedances where due to the following:
  - ✓ Correlation Test that was being conducted and the unit was required to be operated on full load for unit 1 on 26/04/2023.
  - ✓ Fabric Filter bag failures for Unit 1 and Unit 5 on 20/04/2023.

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#### **TABLE 8: PERIODS DURING WHICH CEMS WAS INOPERATIVE**

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

2

TABLE 9: CEMS MONITOR RELIABILITY PERCENTAGE (%)

Associated Unit/Stack	РМ	SO₂	NO <sub>2</sub>	CO <sub>2</sub>	O <sub>2</sub>
Unit 1	98.8	98.3	98.2	98.5	98.5
Unit 2	98.1	97.9	97.8	97.9	97.6
Unit 3	98.6	0	0	0	0
Unit 4	off	off	off	off	off
Unit 5	98.1	98.1	98.1	98.1	97.4
Unit 6	98.2	96.5	96.1	72.9	94.7

Note: SO<sub>2</sub>, O<sub>2</sub> 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 April 2023 was e-mailed to the Licensing Authority.

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## 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 APRIL 2023 **(€)** Eskom CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS\* Date: Sunday, 30 April 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: April Unit Data **GENERAL INFORMATION:** 2 NA Total number of fuel oil tanks: 14.2 Height of tank:\* m Diameter of tank: 12 m Net fuel oil throughput for the month: tons/month 3000 Molecular weight of the fuel oil: 166.00 Lb/lb-mole METEROLOGICAL DATA FOR THE MONTH Unit Data Daily average ambient temperature 20.60 °C Daily maximum ambient temperature 27.37 °C °C 13 11 Daily minimum ambient temperature 10.46 °C Daily ambient temperature range Daily total insolation factor 3 84 kWh/m²/day Tank paint colour Aluminum/Specular NA Tank paint solar absorbtance 0.39 NA FINAL OUTPUT: Result Unit Breathing losses: Working losses: 0.09 kg/month

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\*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.

0.70 kg/month

TOTAL LOSSES (Total TVOC Emissions for the month):

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

No awareness campaigns for this month.

# 10. Complaints Register

TABLE 5: COMPLAINTS FOR THE MONTH OF APRIL 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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Date: 2023/12/2/

Compiled by:	Lutendo Murovhi Nemutambatti. Date: 18/12/2023
	Environmental Officer
Verified by:	Malose Langa Date: 2023/12/20 System Engineer Boiler
Verified by:	Nontuthuko Mpangase Date: 2023/12/20 System Engineer C&I
Supported by:	Mokgadi Dikgale Date: 2023 [2] 2  Environmental Manager
Supported by:	Jabulani Mkhatshwa Date: 2023   12   2   Engineering Group Manager
l Zweli Witbooi, declar	res that the information provided in this report is accurate and

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GENERAL MANAGER: MEDUPI POWER STATION

Yours sincered

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