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		Review Date	January 2024		

Stanley Koenaitse

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Date: 2020/06/30

Enquiries: TR. Rammutla
Tel: 014 762 6375

Ref: H16/1/13-AEL/M1/R1 – Dec 2020 Rev1.

Dear Mr Koenaitse

MEDUPI POWER STATION MONTHLY EMISSIONS REPORT FOR THE MONTH OF DECEMBER 2020

This document serves as the monthly 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 2, 3, 4, 5 and 6 gaseous and particulate emissions performance against the AEL limit for the month of December 2020 only.

1. Raw Materials and Products

Table 1: Quantity of raw materials and products for Unit 2, 3, 4, 5 and 6 in December 2020

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Unit 2, 3, 4, 5 and 6 consumption December 2020
	Coal	Tons/month	1 875 000	716 374
	Fuel Oil	Tons/month	20 000	1460
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Unit 2, 3, 4, 5 and 6 Production Rate in Month of December 2020
	Energy	MW	4 800	2480
	Ash Emitted	Tons/month	not specified	291,4

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Table 2: Daily consumption and production rates

Date	Reportable hours of Operation					Coal usage	Production rate (MW)				
	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6		U2	U3	U4	U5	U6
01-December- 20	off	24,0	15,7	8,9	24,0	25520	off	753	595	590	511
02-December- 20	off	15,5	24,0	24,0	24,0	25528	off	671	710	577	561
03-December- 20	off	3,7	24,0	24,0	24,0	26478	off	743	722	570	502
04-December- 20	off	24,0	24,0	24,0	24,0	28396	off	792	750	592	588
05-December- 20	off	24,0	24,0	24,0	24,0	27357	off	768	739	577	607
06-December- 20	off	24,0	24,0	24,0	11,8	23775	off	680	750	572	414
07-December- 20	off	24,0	24,0	24,0	0,0	25505	off	722	723	598	453
08-December- 20	off	24,0	24,0	24,0	19,3	27531	off	767	674	589	591
09-December- 20	off	4,5	24,0	24,0	24,0	25271	off	748	548	567	511
10-December- 20	off	18,6	1,2	24,0	24,0	25320	off	791	518	567	520
11-December- 20	off	24,0	19,3	24,0	24,0	26695	off	790	581	552	563
12-December- 20	off	17,6	24,0	24,0	24,0	25394	off	778	659	584	516
13-December- 20	off	0,0	24,0	24,0	24,0	26281	off	577	732	600	580
14-December- 20	off	23,7	24,0	24,0	24,0	26511	off	770	598	566	571
15-December- 20	off	24,0	24,0	24,0	24,0	25262	off	755	542	569	491
16-December- 20	off	20,6	24,0	24,0	24,0	22365	off	735	544	555	555
17-December- 20	off	0,0	24,0	24,0	24,0	16284	off	off	580	549	619
18-December- 20	off	0,0	24,0	24,0	24,0	16949	off	off	659	550	594
19-December- 20	off	0,0	24,0	24,0	24,0	23153	off	641	581	571	537
20-December- 20	off	20,7	24,0	24,0	24,0	25007	off	725	686	570	575
21-December- 20	off	24,0	24,0	24,0	24,0	25557	off	794	750	500	581
22-December- 20	off	24,0	24,0	24,0	24,0	26007	off	792	731	521	517
23-December- 20	off	24,0	24,0	24,0	24,0	26261	off	729	696	542	545
24-December- 20	off	24,0	24,0	24,0	24,0	23149	off	706	516	523	548
25-December- 20	off	22,3	24,0	24,0	24,0	21528	off	662	561	488	450
26-December- 20	off	0,0	18,8	24,0	24,0	15192	off	off	481	528	589
27-December- 20	off	0,0	0,0	24,0	24,0	10946	off	off	off	536	577
28-December- 20	off	0,0	0,0	24,0	24,0	17164	off	off	off	534	528
29-December- 20	off	0,0	23,5	24,0	24,0	18182	off	off	700	514	513
30-December- 20	off	0,0	24,0	24,0	24,0	20037	off	off	743	572	598
31-December- 20	off	0,0	24,0	24,0	24,0	17775	off	off	694	459	572

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2. Abatement Technology

Table 3: Abatement Equipment Control Technology efficiency for month of December 2020

Associated Unit/Stack	Technology Type	Efficiency
Unit 1	Fabric Filter Plant (FFP)	-
Unit 2	Fabric Filter Plant (FFP)	-
Unit 3	Fabric Filter Plant (FFP)	99,916%
Unit 4	Fabric Filter Plant (FFP)	99,070%
Unit 5	Fabric Filter Plant (FFP)	99,857%
Unit 6	Fabric Filter Plant (FFP)	99,814%

3. Energy Source Characteristics

Table 4: Energy Source Material Characteristics for the month of December 2020

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	1.32
Ash Content	35 - 39	33.73

Table 5: Energy Source Material Characteristics for the month of December 2020

Characteristic	Stipulated Range (%)	Monthly Average Content (%)
	Oil	
Sulphur Content	0.5 - 3.5	2.2
Ash Content	0.02 - 0.1	0.02

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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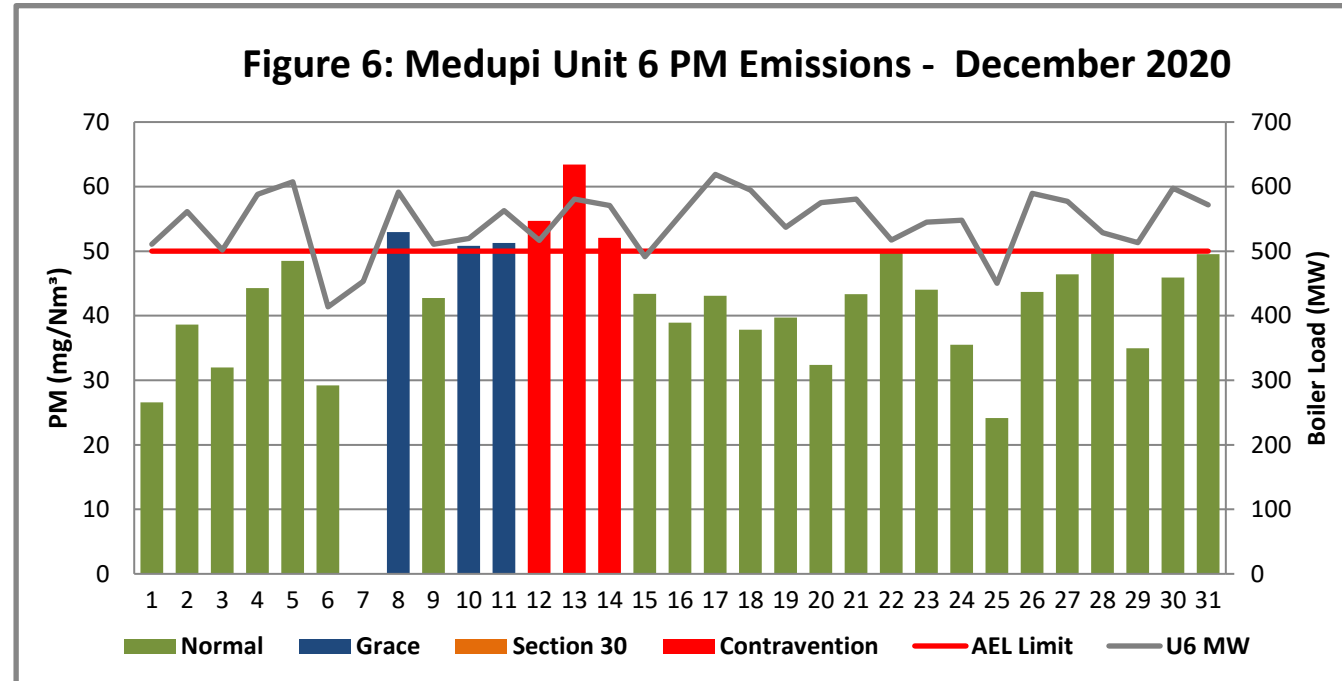
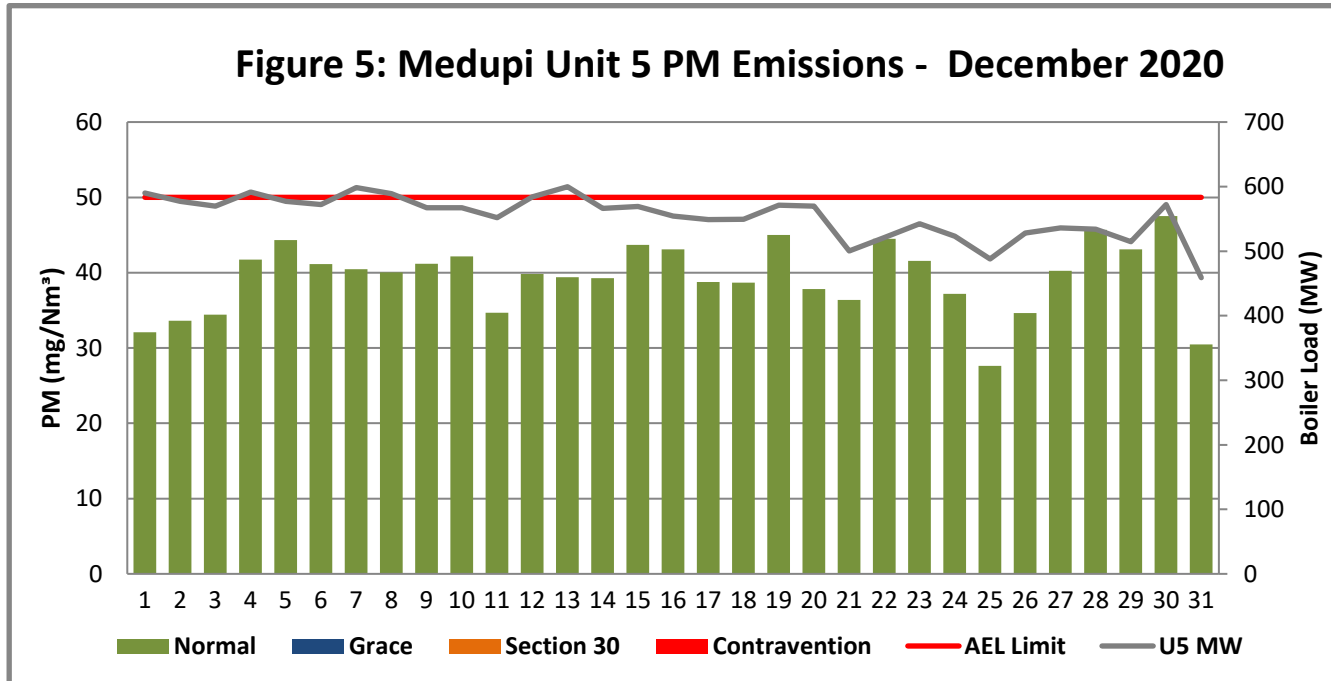
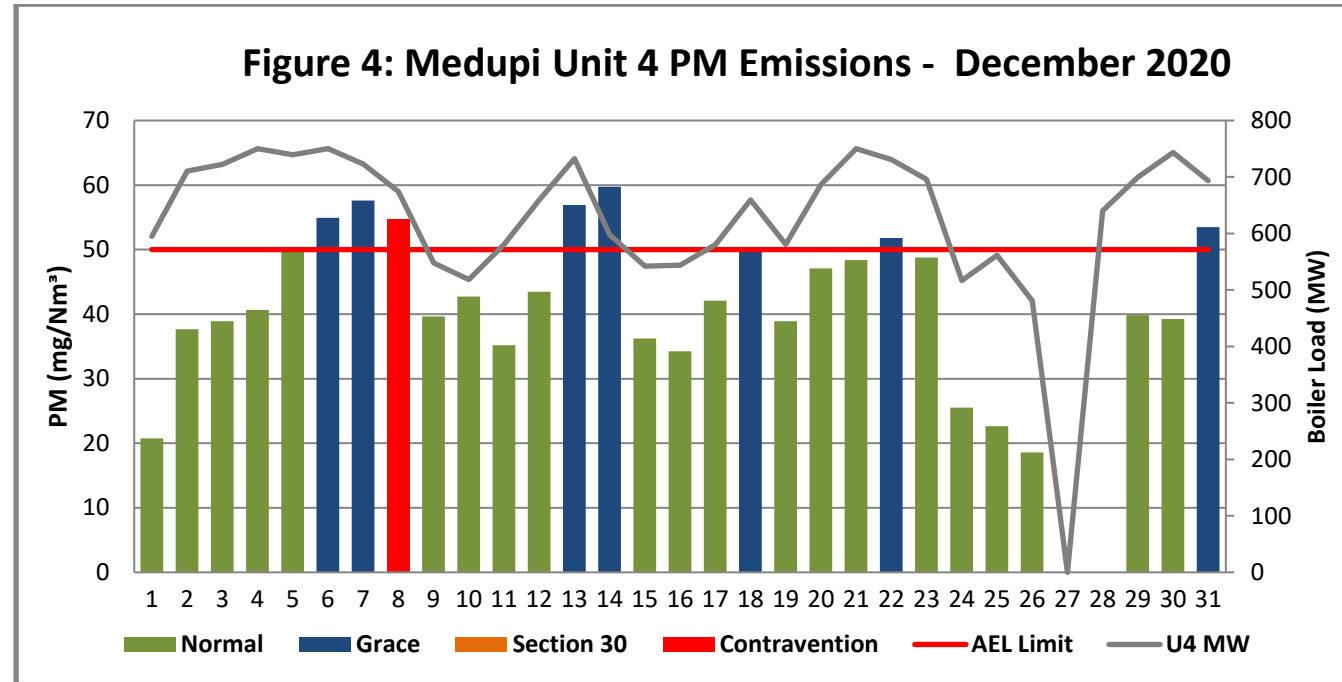
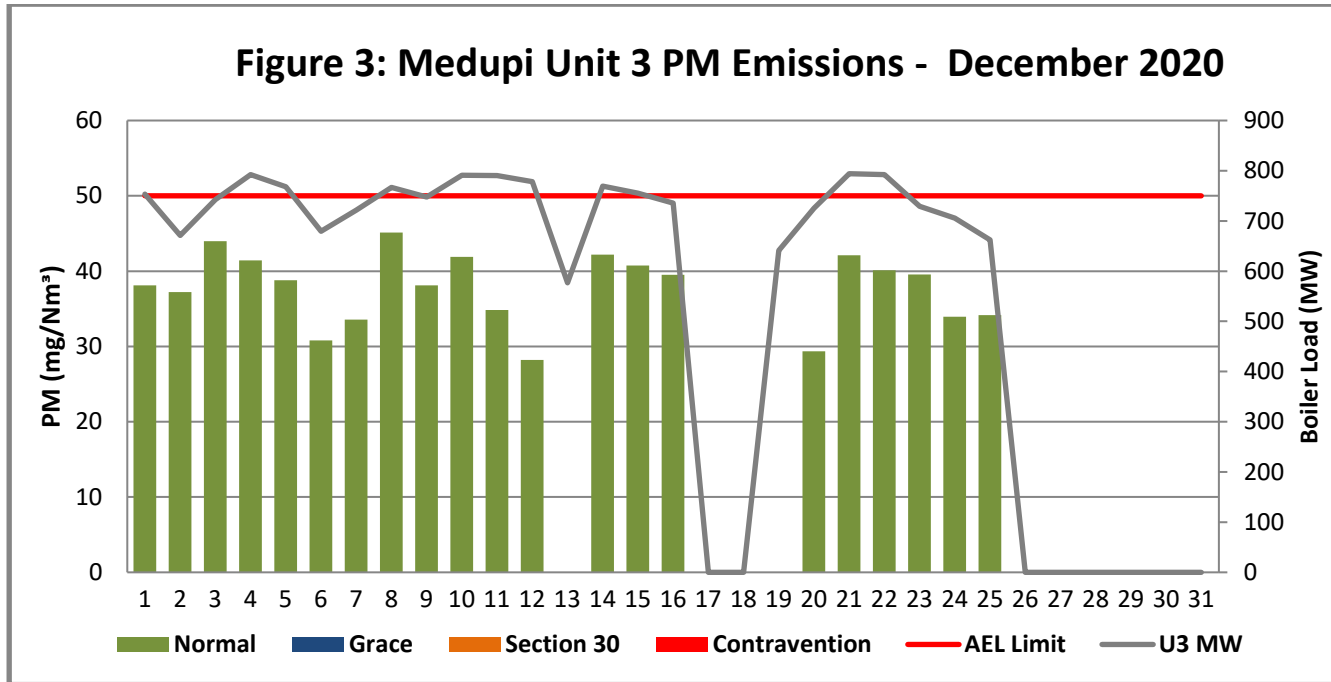
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Medupi Power Station graphical representation of the daily average emissions for particulates

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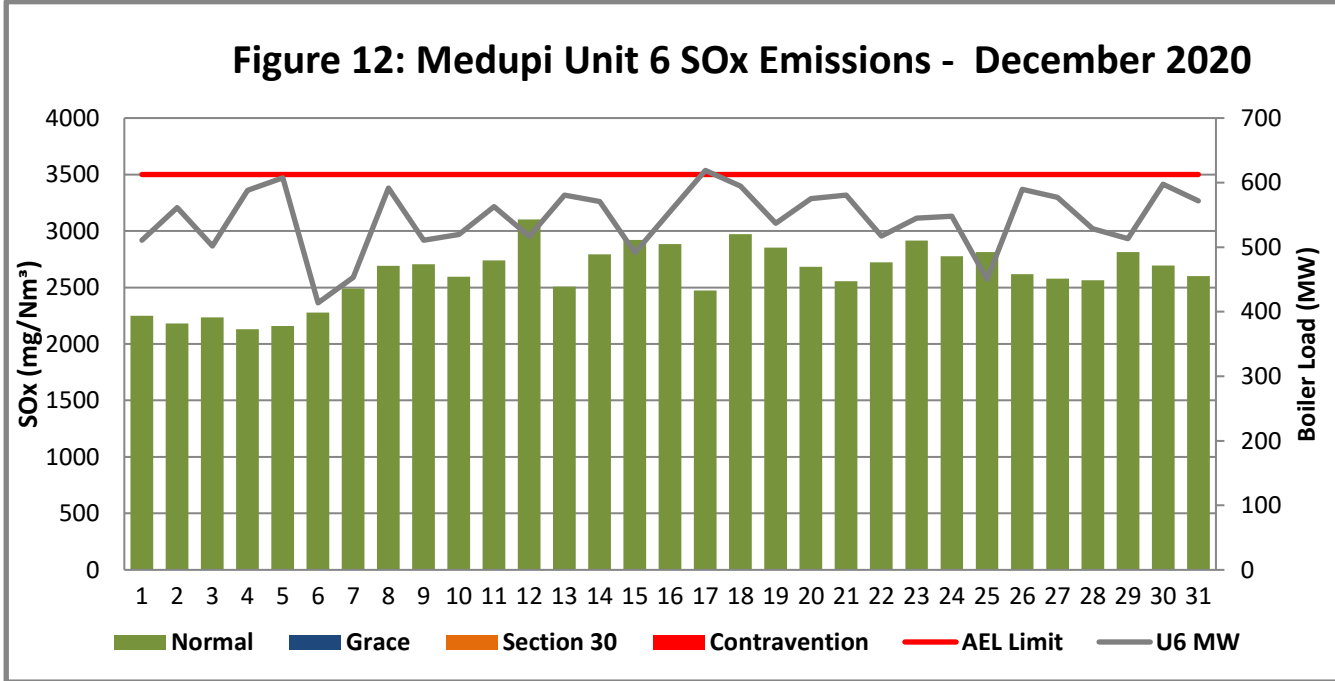
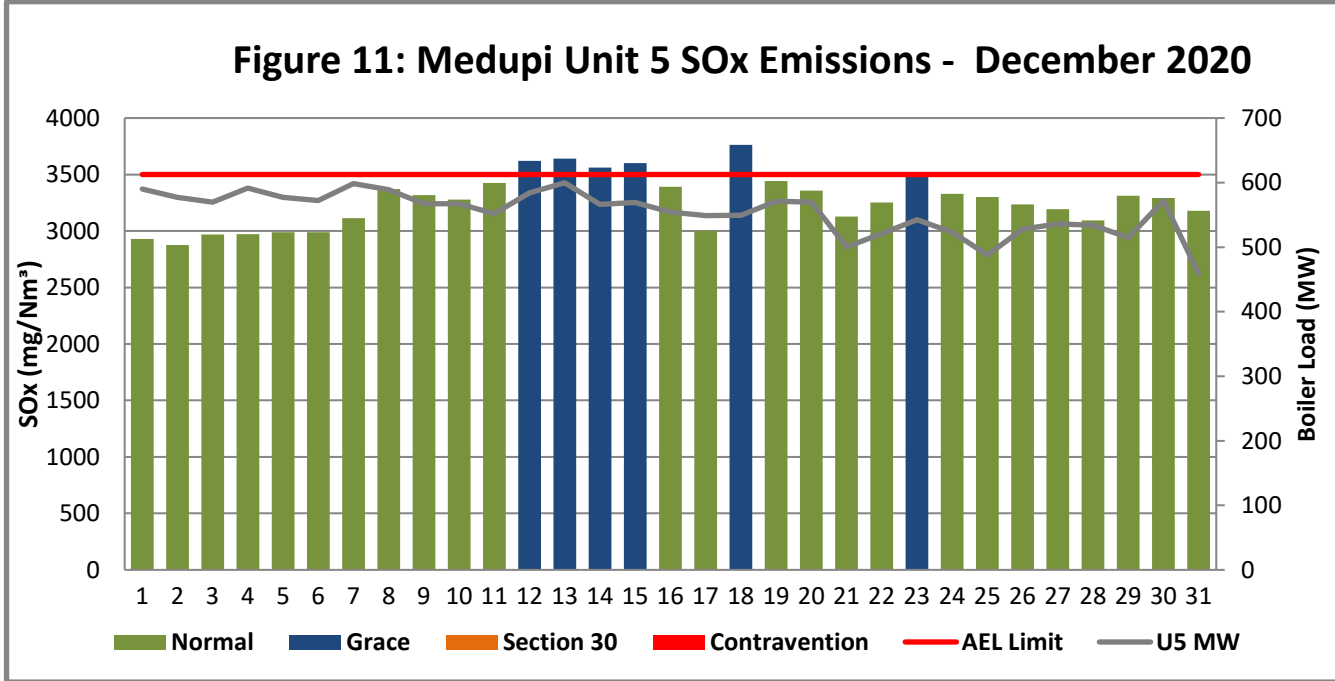
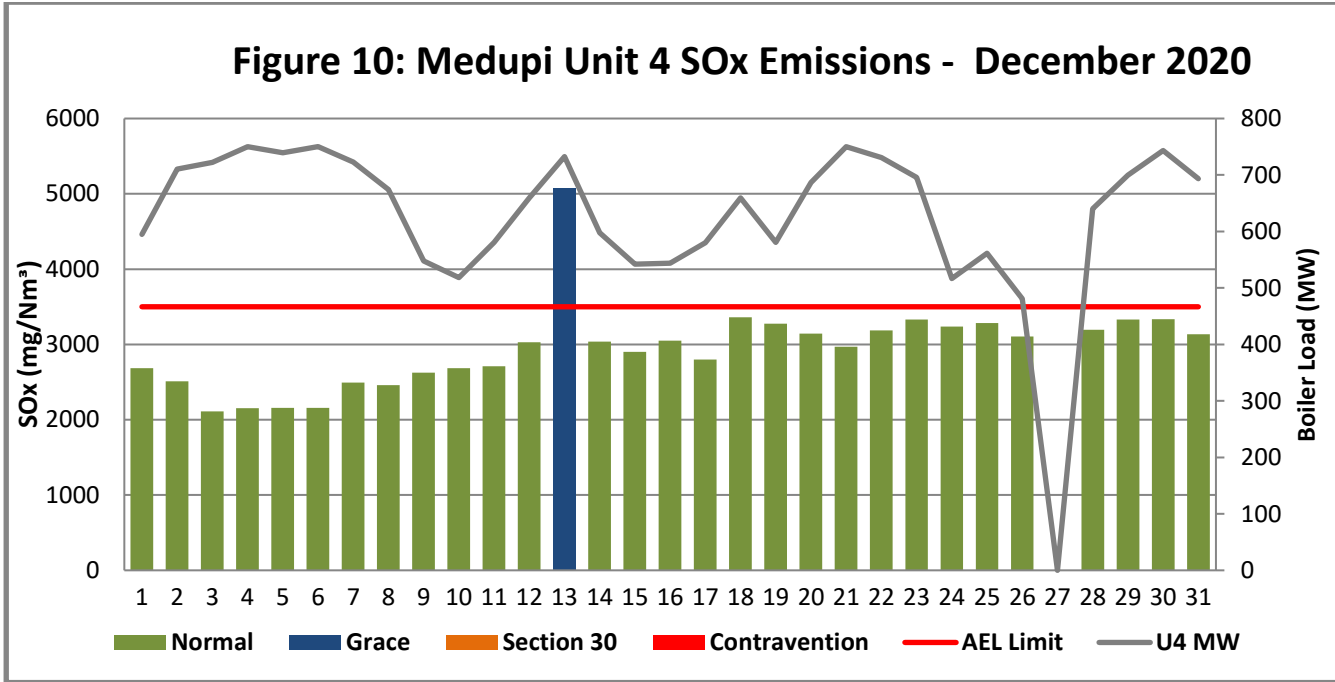
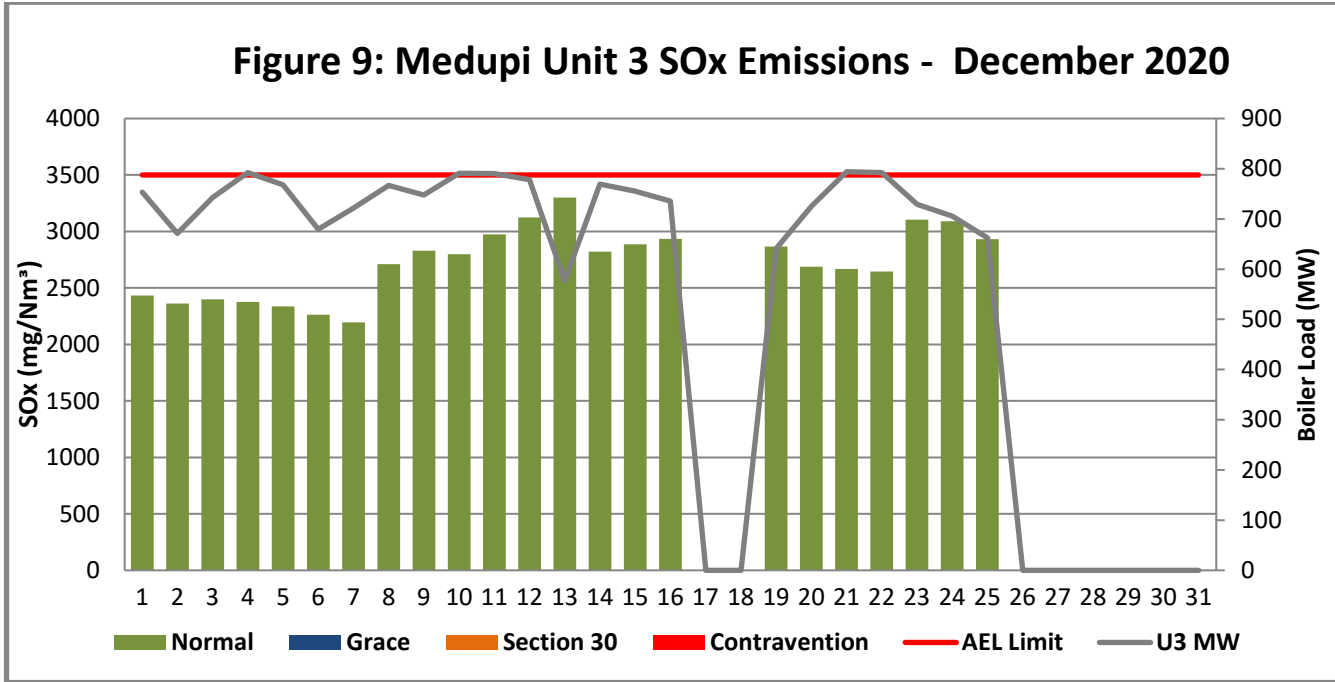
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Medupi Power Station graphical representation of the daily average emissions for SO_x

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Figure 15: Medupi Unit 3 NOx Emissions - December 2020

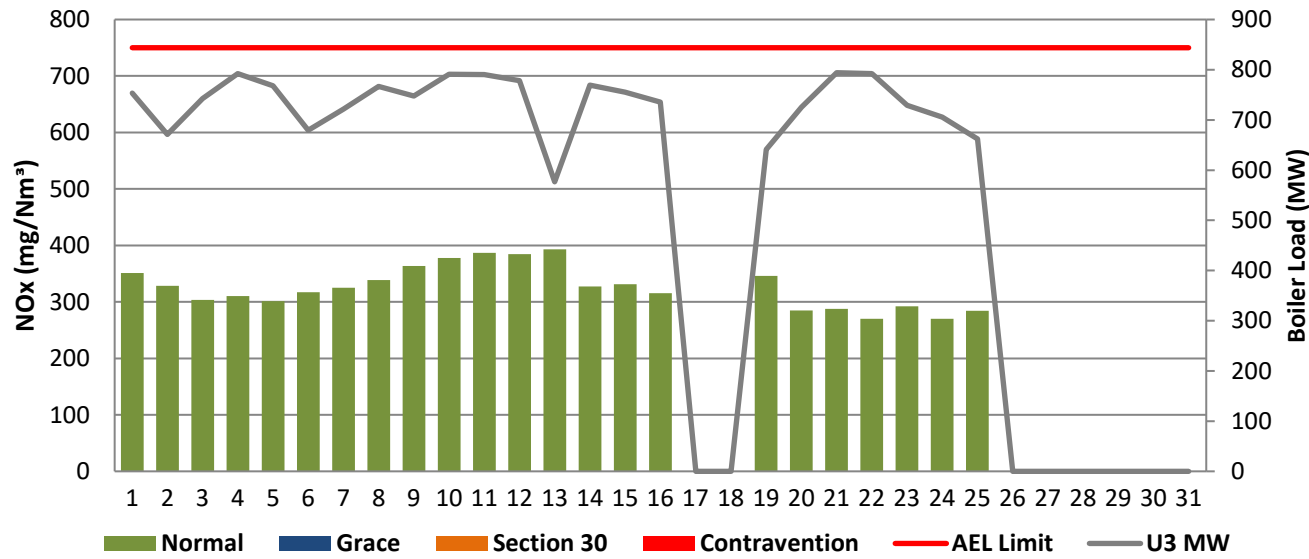


Figure 16: Medupi Unit 4 NOx Emissions - December 2020

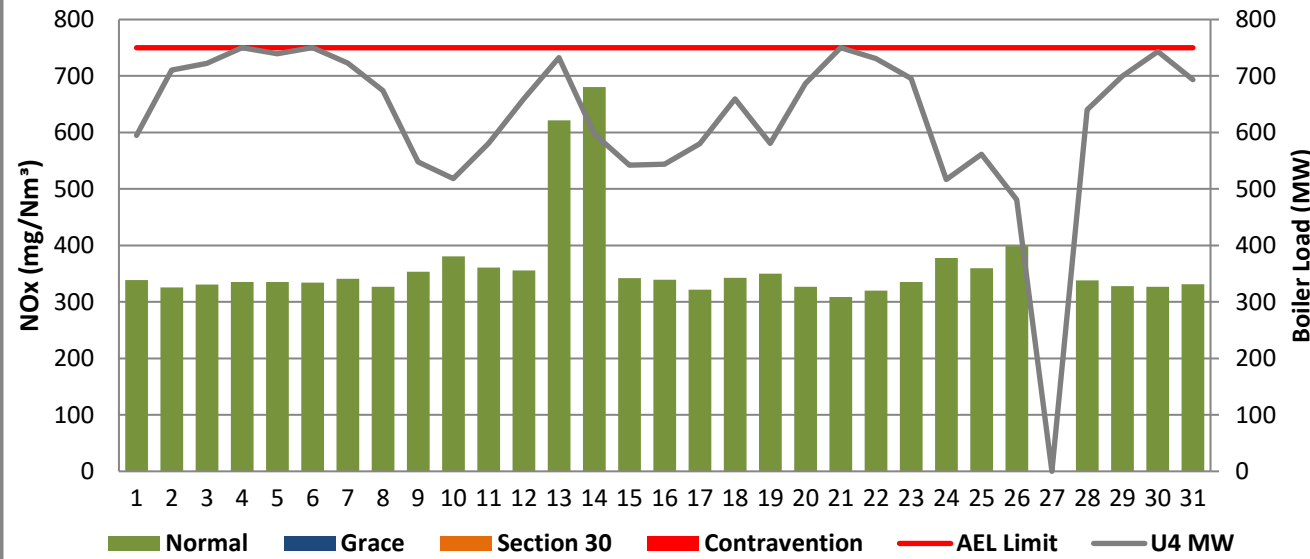


Figure 17: Medupi Unit 5 NOx Emissions - December 2020

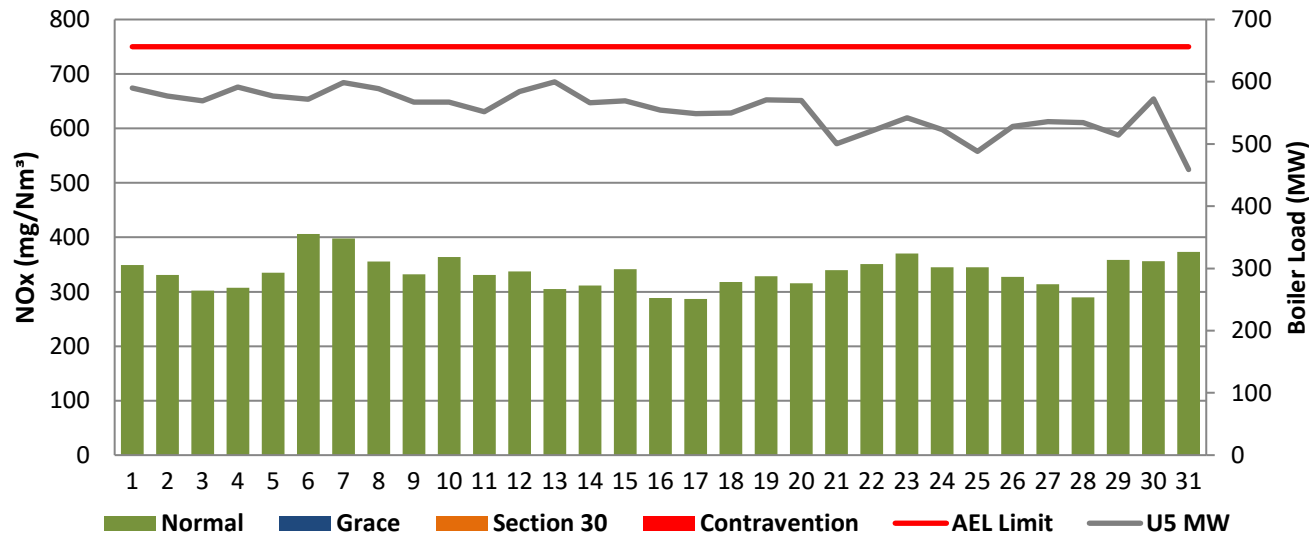
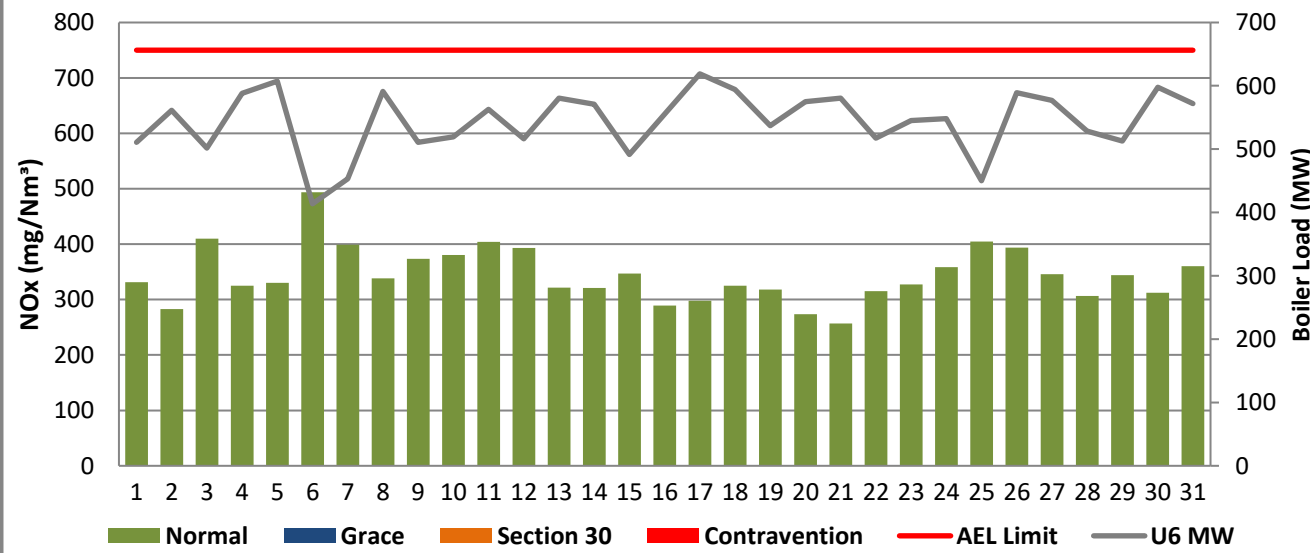


Figure 18: Medupi Unit 6 NOx Emissions - December 2020



Medupi Power Station graphical representation of the daily average emissions for NO₂

Note: the graphs above should be read with table 2 in order to understand the gaps in terms emissions reading on the graphs.

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Table 7: Monthly tonnages for the month of December 2020

Unit	PM (tons)	SO ₂ (tons)	NO ₂ (tons)	CO (tons)
1	-	-	-	-
2	-	-	-	-
3	48,8	3 890	465	128
4	89,1	6 258	769	142
5	69,9	5 899	605	54
6	83,7	5 248	679	60
SUM	291,4	21 295	2 518	383

5. Comments on the performance and availability of each unit

Medupi Power station complied with the average emissions limit for NO_x and SO_x pollutants in all units during the reporting period. Unit 4 and 6 PM exceeded the limit on different days, some of these exceedances fall under grace period and other are recorded as contraventions as depicted in the figures above. Unit 2 was on outage in the month of December 2020.

6. Continuous Emission Monitoring Systems (CEMS)

Unit 3, 4, 5 and 6 Continuous Emission Monitoring Systems were in operation at all times when the unit was on load.

Table 6: Periods during which CEMS was inoperative

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

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Table 7: CEMS Monitor Reliability

Associated Unit/Stack	PM	SO ₂	NO	O ₂
Unit 1	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>
Unit 2	-	-	-	-
Unit 3	99,9	99,6	99,6	99,6
Unit 4	100,0	94,9	95,8	95,1
Unit 5	100,0	95,7	95,6	95,7
Unit 6	100,0	99,6	96,9	98,1

7. CEMS Calibration certificates and equipment used for calibration

To be made available upon request

8. Ambient Air Quality Monitoring Report

The Ambient Air Quality Monitoring and Dust fall-out report are emailed to the Licensing authority on a monthly basis.

9. Visual inspection of the exterior walls of the fuel oil tanks, fuel oil inventory data and TVOC Estimation

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

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Table 8: Total Volatile Organic Compound (TVOC) for December 2020

		
CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS*		
Date:	31 December 2020	
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	
<p style="text-align: center;"> 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 </p>		
MONTH:	December	
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:	1460	tons/month
Molecular weight of the fuel oil:	166.00	Lb/lb-mole
METEROLOGICAL DATA FOR THE MONTH		
	Data	Unit
Daily average ambient temperature	27.35	°C
Daily maximum ambient temperature	33.26	°C
Daily minimum ambient temperature	21.97	°C
Daily ambient temperature range	11.30	°C
Daily total insolation factor	6.12	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:	0.04 kg/month	
TOTAL LOSSES (Total TVOC Emissions for the month):	0.73 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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10. Air quality improvements initiatives and public education and awareness campaigns

No awareness campaign.

11. Complaints Register


Table 9: Complaints for the month of December 2020

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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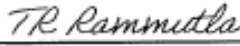
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Compiled by: Lufuno Tshidzumba 
Senior Environmental Advisor

Verified by: Malose Langa 
System Engineer Boiler


Supported by: Sithokozile Hlongwa 
Boiler Engineering Manager

Supported by: Rosetta Rammutla 
Environmental Manager

Supported by: Jabulani Mkhathshwa 
Engineering Group Manager

I Dan Mashigo, declares that the information provided in this report is accurate and correct.

Yours sincerely


 Dan Mashigo
GENERAL MANAGER: MEDUPI POWER STATION (Acting)

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