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		Effective Date	January 2021		
		Review Date	January 2024		

Phumudzo Thivhafuni

Date: 2021/07/15

Limpopo Dept. of Economic Development, Environment and Tourism

Enquiries: TR. Rammutla

Private Bag 9484
POLOKWANE
0700

Tel: 014 762 6375

ThivhafuniPO@ledet.gov.za

Ref: 12/4/12L-W2/A3 – June 2020 Rev.1

Dear Phumudzo

MEDUPI POWER STATION MONTHLY EMISSIONS REPORT FOR THE MONTH OF JUNE 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), 12/4/12L-W2/A3.

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 June 2020 only.

1. Raw Materials and Products

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

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Unit 2,3, 4, 5 and 6 consumption June 2020
	Coal	Tons/month	1 875 000	789 747
	Fuel Oil	Tons/month	40 000	1444
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Unit 2, 3, 4, 5 and 6 Production Rate in Month of June 2020
	Energy	MW	4 800	2957
	Ash Emitted	Tons/month	not specified	240.6

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Table 2: Daily consumption and production rates


Date	Reportable hours of Operation					Fuel Consumption (tons)				Production (MW)
	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Oil		Coal	Units	
						Aux Boiler	Units	Total	Units	2,3,4,5 & 6
01- Jun -20	24,0	24,0	24,0	24,0	0,0		30	30	25660	2318,1
02- Jun -20	24,0	24,0	24,0	24,0	0,0		22	22	24688	2392,2
03- Jun -20	24,0	24,0	24,0	24,0	0,0		3	3	26146	2524,1
04- Jun -20	24,0	24,0	24,0	24,0	0,0		15	15	26168	2535,8
05- Jun -20	24,0	24,0	13,3	24,0	0,0		0.0	0.0	25010	2557,6
06- Jun -20	24,0	24,0	0,0	24,0	0,0		149	149	23550	2498,3
07- Jun -20	24,0	24,0	22,8	24,0	0,0		130	130	27571	2540,3
08- Jun -20	5,5	24,0	24,0	24,0	0,0		4	4	26146	2363,3
09- Jun -20	15,3	24,0	24,0	24,0	0,0		0.0	0.0	26516	2413,1
10- Jun -20	19,6	24,0	24,0	24,0	0,0		44	44	25578	2465,7
11- Jun -20	0,0	24,0	24,0	24,0	0,0		0.0	0.0	19549	1836,7
12- Jun -20	0,0	24,0	24,0	24,0	0,0		0.0	0.0	17942	1680,3
13- Jun -20	0,0	22,6	24,0	24,0	0,0		13	13	18432	1760,1
14- Jun -20	0,0	0,0	24,0	24,0	0,0		2	2	12707	1354,9
15- Jun -20	4,8	0,0	24,0	24,0	0,0		0.0	0.0	17991	1773,7
16- Jun -20	24,0	3,2	24,0	24,0	0,0		154	154	25495	2357,8
17- Jun -20	24,0	24,0	24,0	24,0	0,0		0.0	0.0	26587	2424,7
18- Jun -20	24,0	24,0	24,0	24,0	0,0		6	6	30870	2652,9
19- Jun -20	24,0	24,0	24,0	24,0	17,0		0.0	0.0	31109	2488,4
20- Jun -20	24,0	24,0	24,0	24,0	24,0		521	521	28165	2206,6
21- Jun -20	24,0	24,0	24,0	24,0	24,0		0.0	0.0	31159	2385,5
22- Jun -20	24,0	24,0	24,0	24,0	24,0		60	60	33489	2582,4
23- Jun -20	24,0	24,0	24,0	24,0	24,0		0.0	0.0	34647	2535,3
24- Jun -20	24,0	24,0	24,0	11,5	24,0		214	214	32670	2349,1
25- Jun -20	24,0	24,0	24,0	6,5	24,0		6	6	34304	2557,3
26- Jun -20	24,0	24,0	24,0	24,0	24,0		5	5	34348	2435,1
27- Jun -20	24,0	24,0	24,0	24,0	24,0		0.0	0.0	31986	2247,5
28- Jun -20	24,0	24,0	24,0	24,0	24,0		24	24	30026	2248,4
29- Jun -20	24,0	24,0	24,0	24,0	24,0		42	42	32467	2484,3
30- Jun -20	24,0	24,0	24,0	24,0	24,0		0.0	0.0	33968	2530,3

Note: fuel oil consumption by the auxiliary boilers for the month of June was not verified.

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2. Abatement Technology

Table 3: Abatement Equipment Control Technology utilisation for month of June 2020

Associated Unit/Stack	Technology Type	Efficiency
Unit 1	<i>Fabric Filter Plant (FFP)</i>	-
Unit 2	<i>Fabric Filter Plant (FFP)</i>	99,959%
Unit 3	<i>Fabric Filter Plant (FFP)</i>	99,967%
Unit 4	<i>Fabric Filter Plant (FFP)</i>	99,819%
Unit 5	<i>Fabric Filter Plant (FFP)</i>	99,882%
Unit 6	<i>Fabric Filter Plant (FFP)</i>	99,867%

3. Energy Source Characteristics

Table 4: Energy Source Material Characteristics for the month of June 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	1.38
Ash Content	35 - 39	34.5

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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Medupi Power Station graphical representation of emissions data

Figure 2: Medupi Unit 2 PM Emissions - June 2020

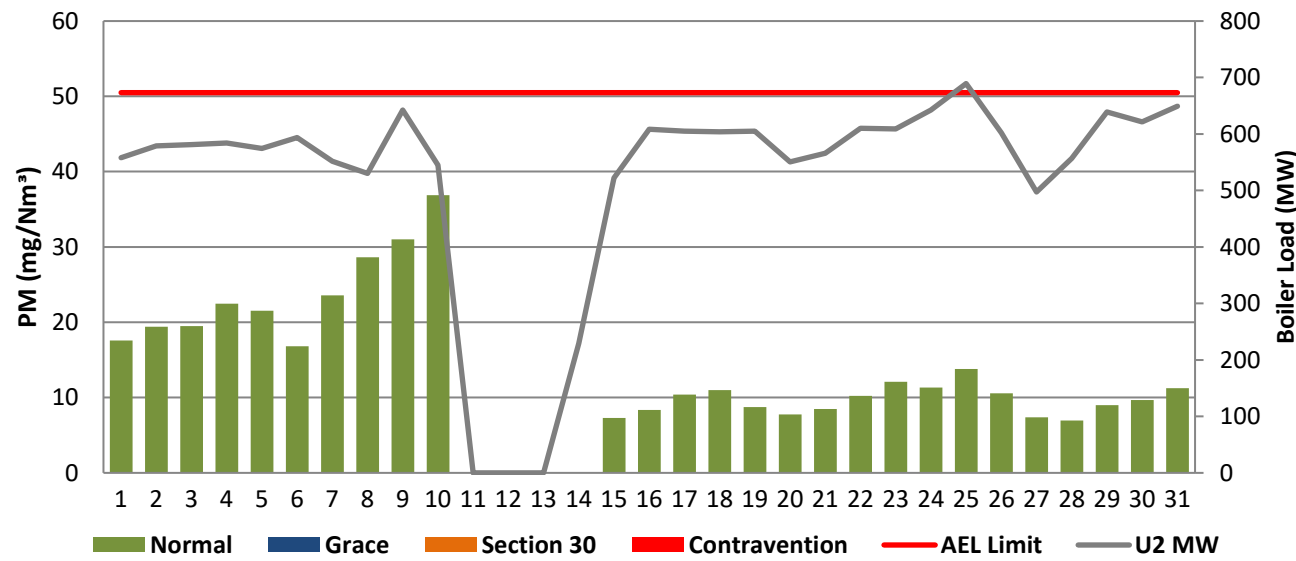


Figure 3: Medupi Unit 3 PM Emissions - June 2020

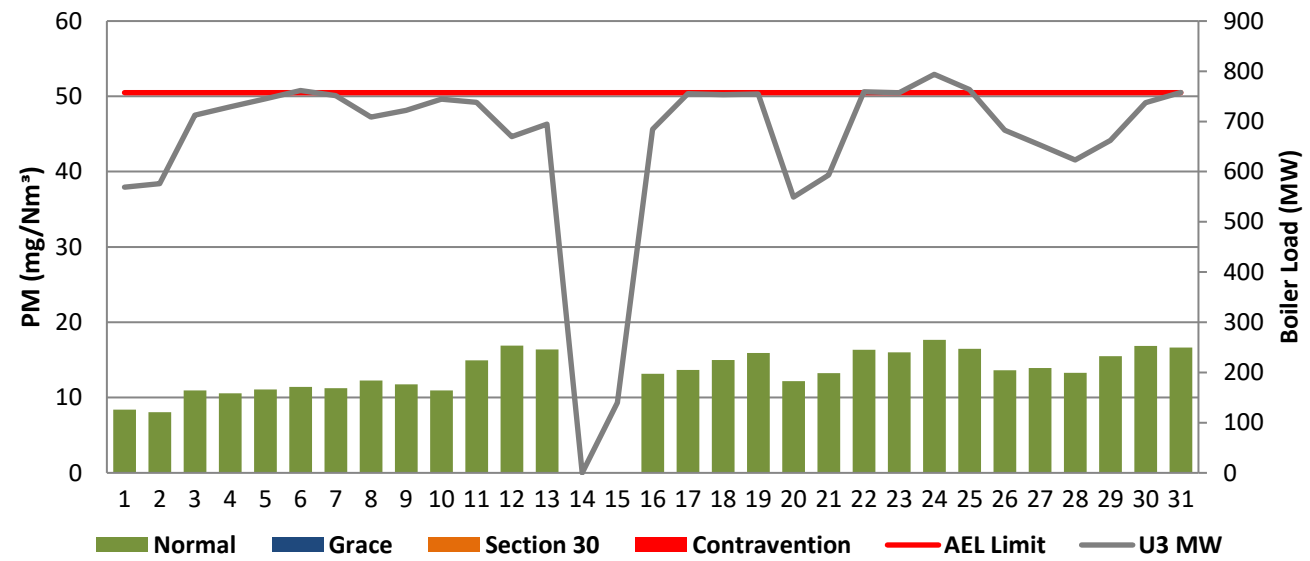


Figure 4: Medupi Unit 4 PM Emissions - June 2020

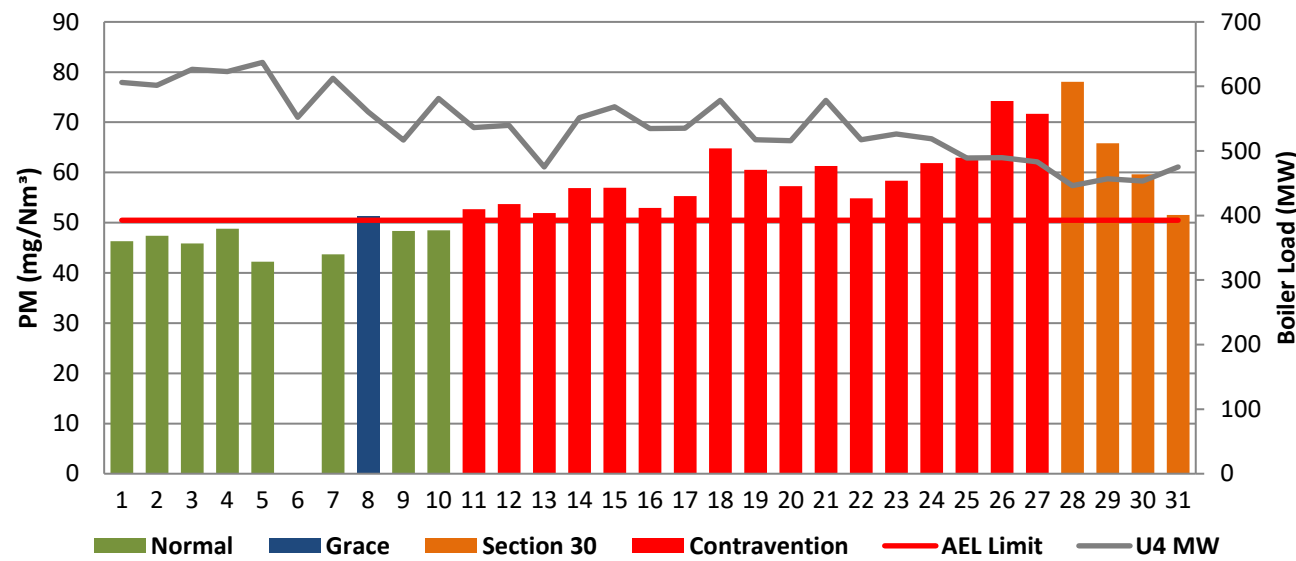
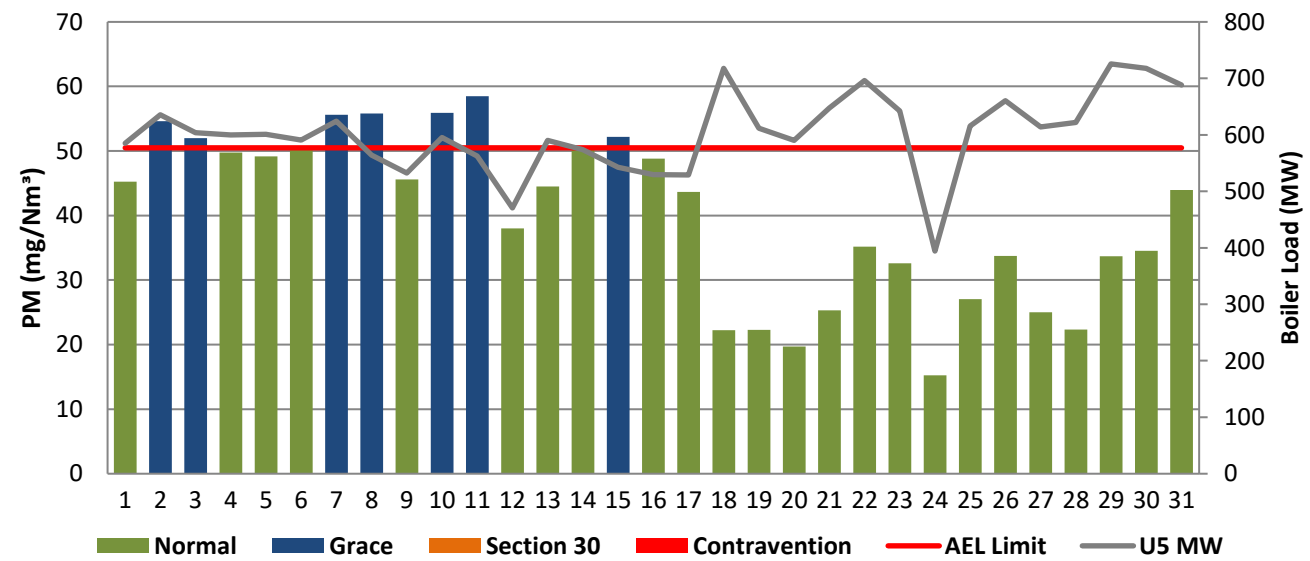


Figure 5: Medupi Unit 5 PM Emissions - June 2020



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Figure 6: Medupi Unit 6 PM Emissions - June 2020

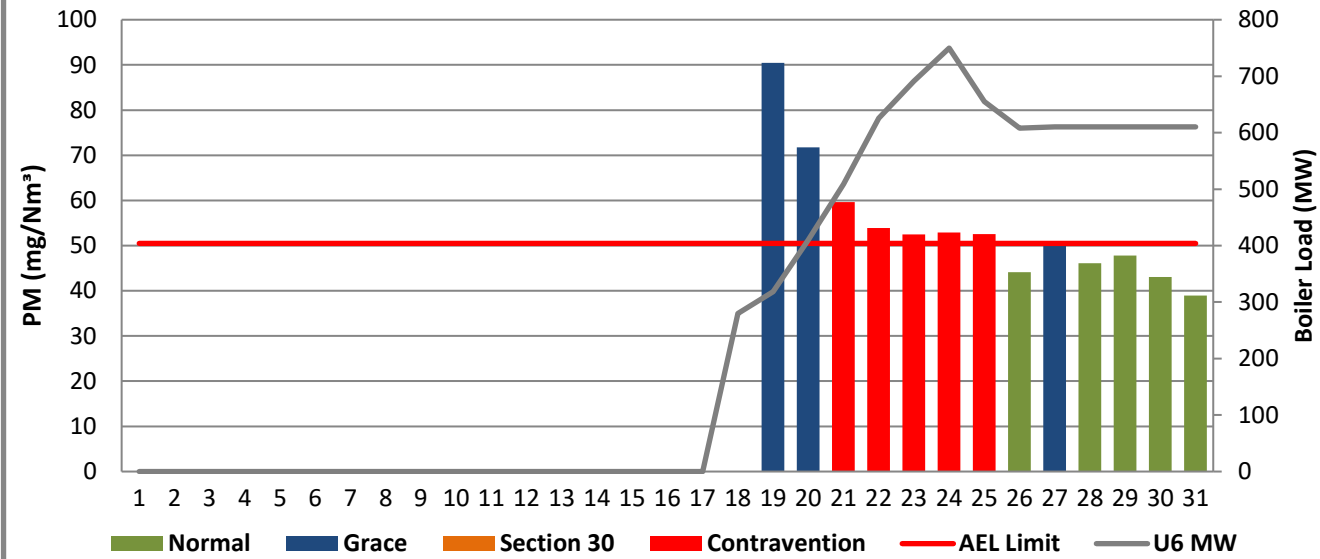


Figure 8: Medupi Unit 2 SOx Emissions - June 2020

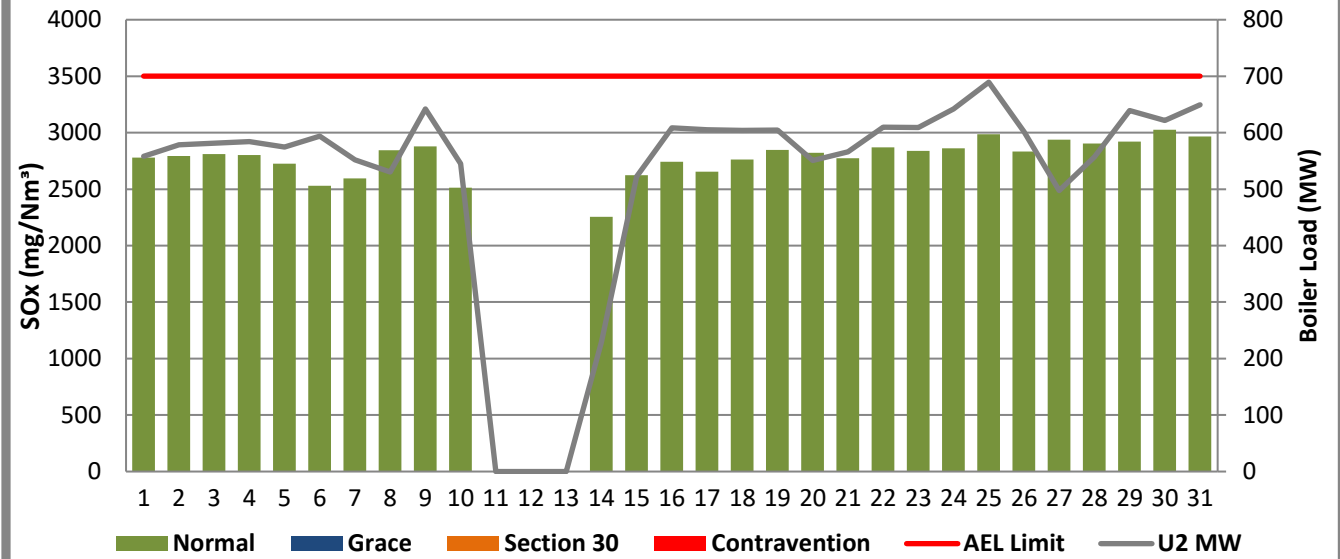


Figure 9: Medupi Unit 3 SOx Emissions - June 2020

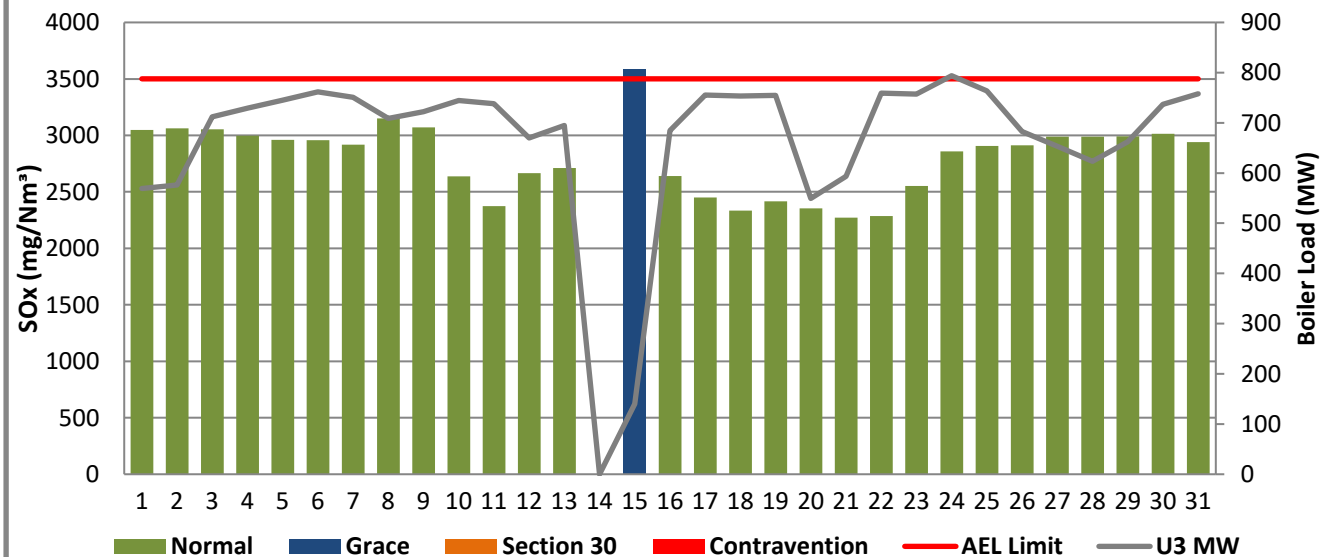
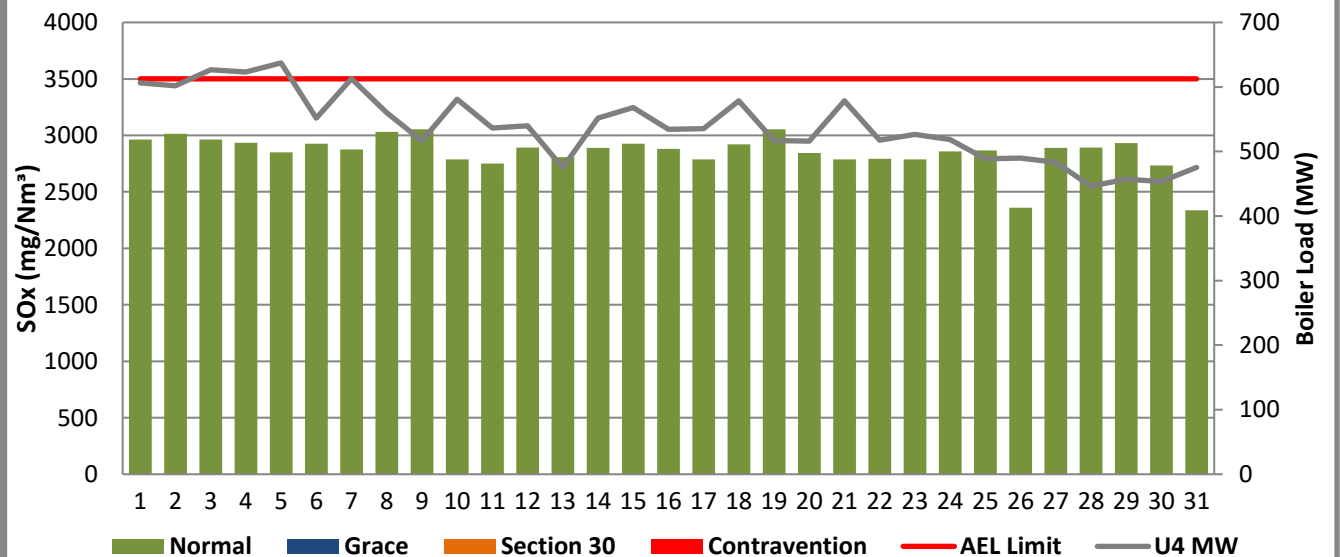


Figure 10: Medupi Unit 4 SOx Emissions - June 2020



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Figure 11: Medupi Unit 5 SOx Emissions - June 2020

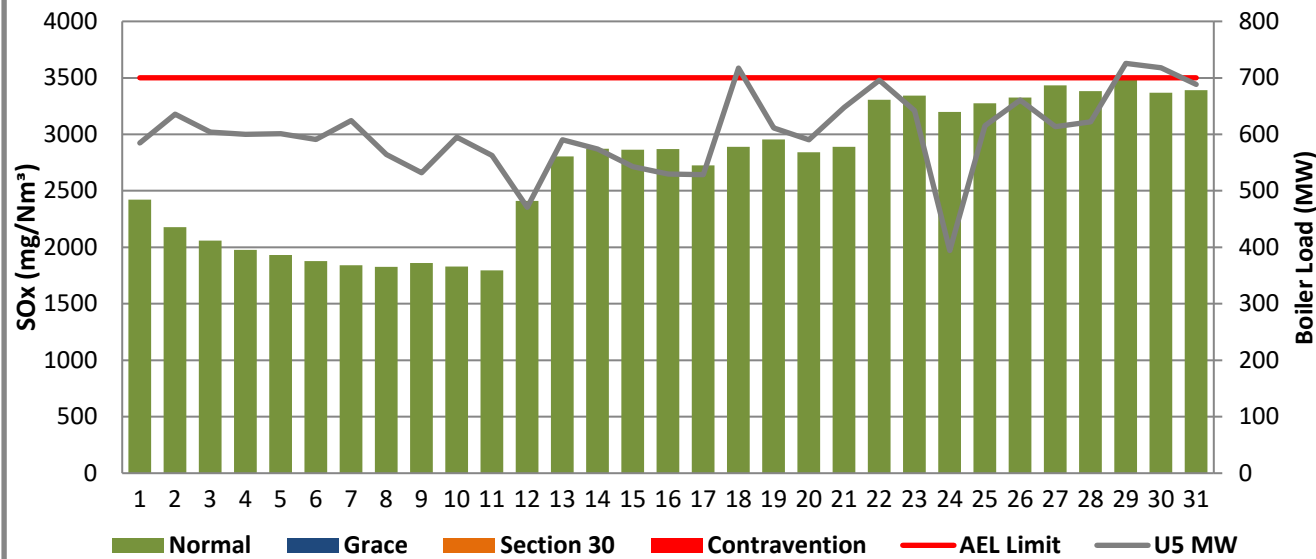


Figure 12: Medupi Unit 6 SOx Emissions - June 2020

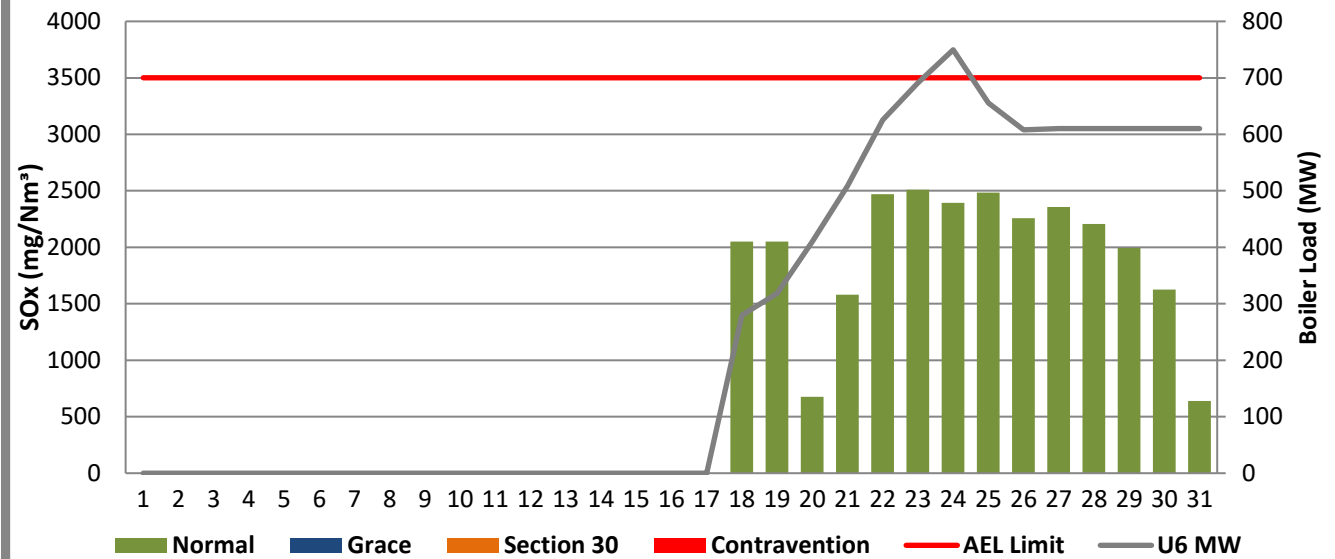


Figure 14: Medupi Unit 2 NOx Emissions - June 2020

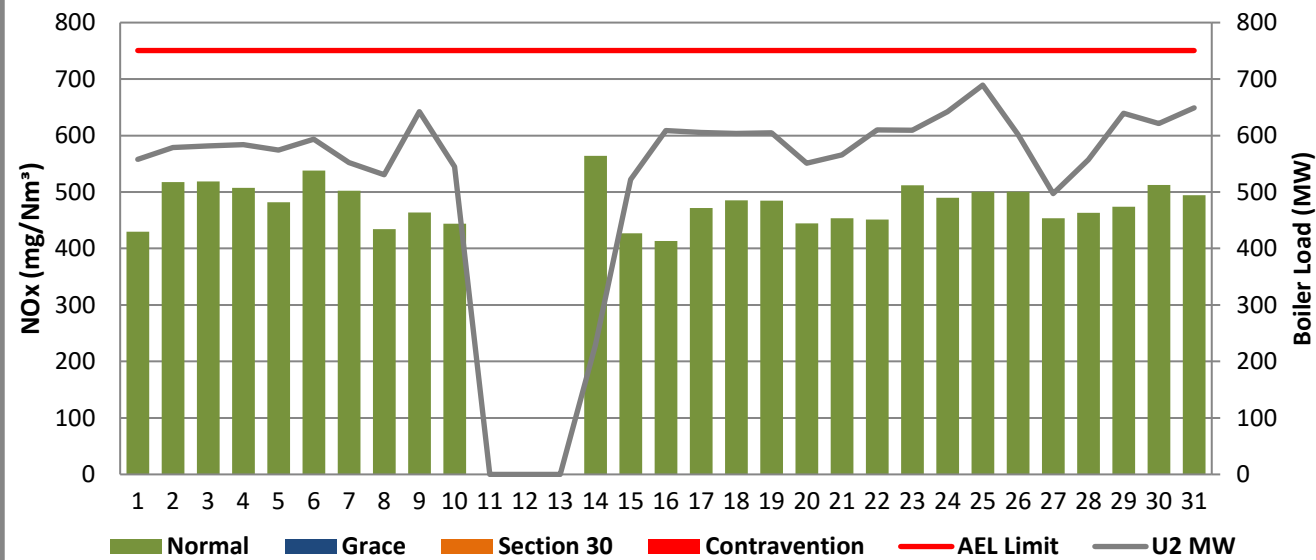
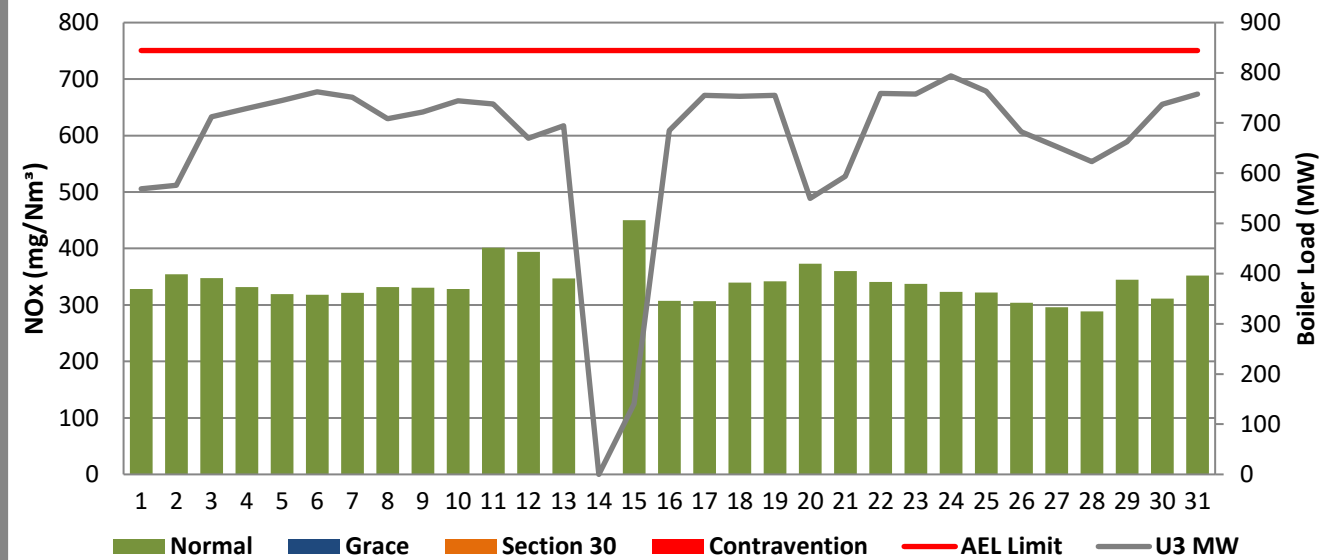


Figure 15: Medupi Unit 3 NOx Emissions - June 2020



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Figure 16: Medupi Unit 4 NOx Emissions - June 2020

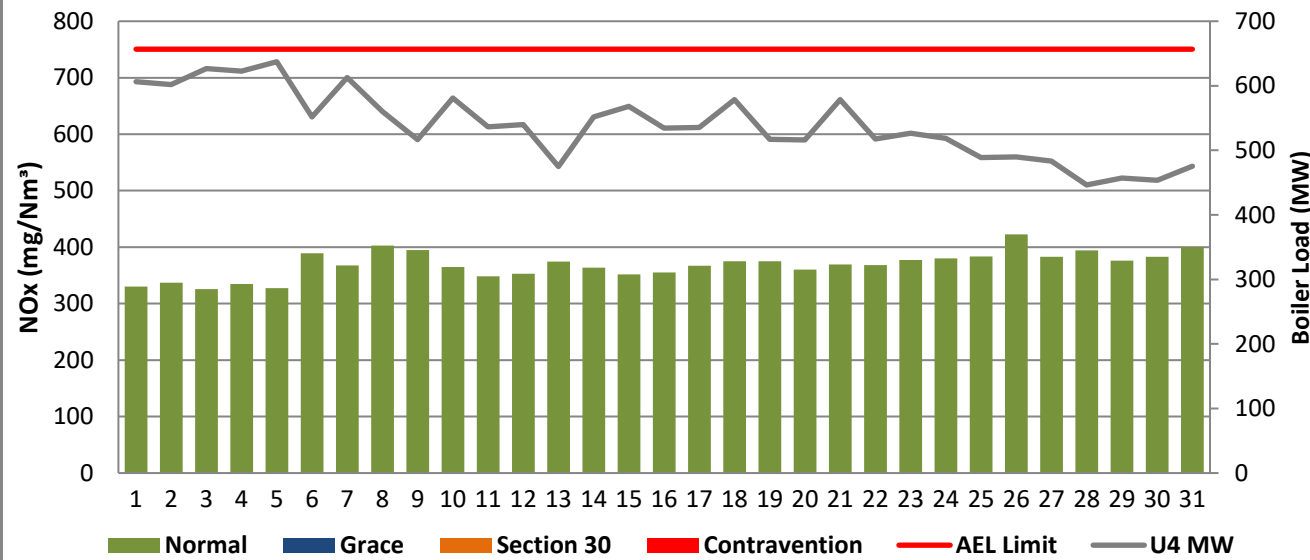


Figure 17: Medupi Unit 5 NOx Emissions - June 2020

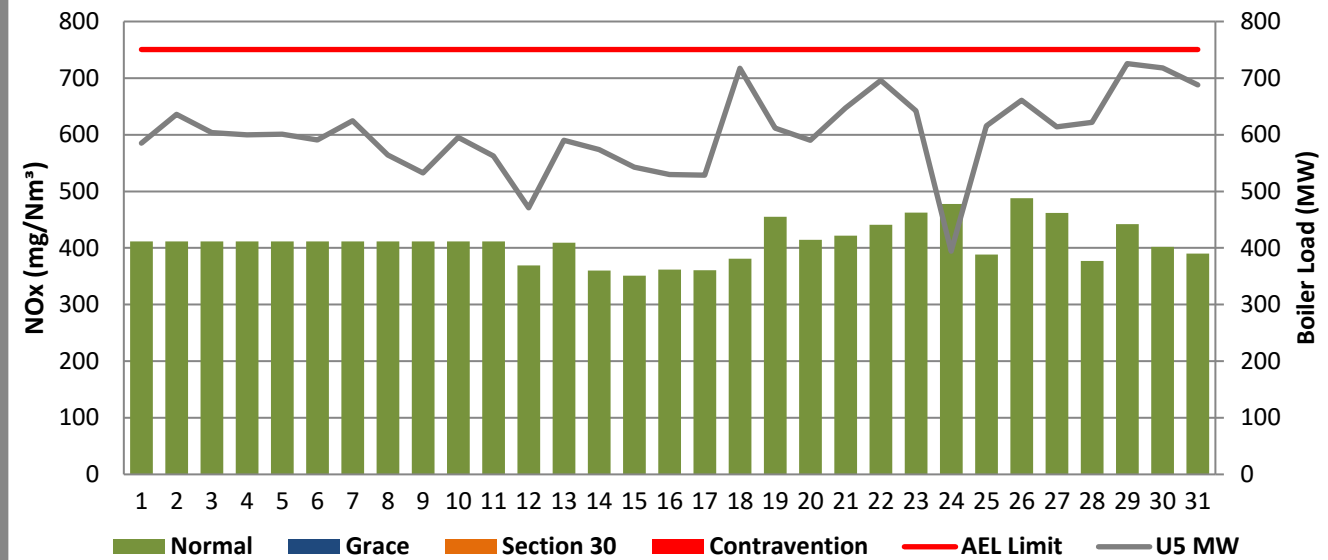
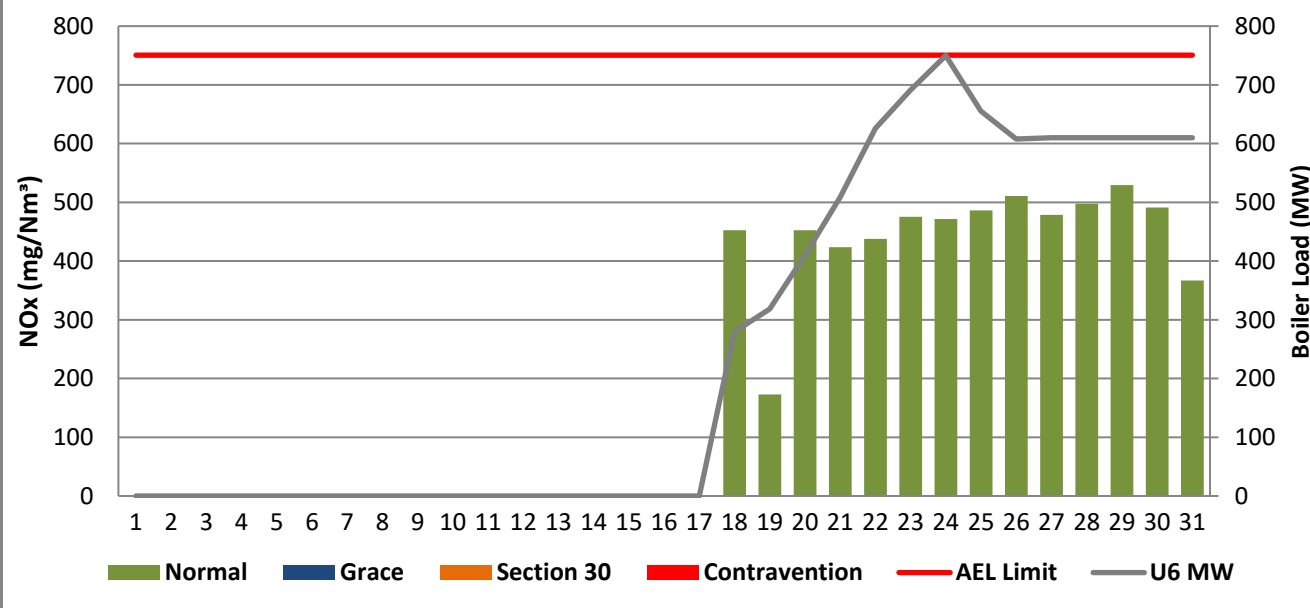


Figure 18: Medupi Unit 6 NOx Emissions - June 2020



Note: Point 31 on all graphs represent the 1st of July 2020. The figures above are deliberately numbered in a random fashion. There were issues with unit 5 NOx monitoring instrument in the beginning on of the month.

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Table 5: Monthly tonnages for the month of June 2020

Associated Unit/Stack	PM	SO ₂	NO ₂	CO
Unit 1	0.0	0	0	0
Unit 2	21,1	4 400	748	26
Unit 3	22,1	4 700	561	77
Unit 4	97,7	5 020	640	54
Unit 5	68,4	4 929	741	106
Unit 6	31,2	1 303	285	10
SUM	240,6	20 352	2 974	273

5. Comments on the performance and availability of each unit

Gaseous emissions on all units were within the limit for June reporting period. Exceedances due to upset conditions were evident on unit 4 and 5. Exceedances on unit 4 were reported in terms of NEMA s30. Unit 6 exceedances were only identified during data back-fitting and are as such reported as contraventions.

6. Continuous Emission Monitoring Systems (CEMS)

Unit 2, 3, 4, 5 and 6 Continuous Emission Monitoring Systems were in operation at all times when the unit was on load. Unit 5 and 6 NO_x emissions monitoring instrument had issues between 1 and 11 June 2020.

Table 6: Periods during which CEMS was inoperative

Date	Time	CEMS status	Comments
1-11 June 2020	N/A	NO _x monitor faulty	The monitor was fixed

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Table 7: CEMS Monitor Reliability

Associated Unit/Stack	PM	SO ₂	NOx	O ₂
Unit 2	100,0	98,3	98,3	97,7
Unit 3	100,0	98,7	99,8	97,3
Unit 4	99,9	99,9	99,9	99,9
Unit 5	100,0	99,9	61,7	99,7
Unit 6	100,0	77,6	72,1	71,5

7. CEMS Calibration certificates and equipment used for calibration

See attached Appendix A

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 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 June 2020

		
CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS*		
Date:	30 June 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	
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:	June	
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:	1444	tons/month
Molecular weight of the fuel oil:	166.00	Lb/lb-mole
METEROLOGICAL DATA FOR THE MONTH	Data	Unit
Daily average ambient temperature	16.61	°C
Daily maximum ambient temperature	25.19	°C
Daily minimum ambient temperature	9.38	°C
Daily ambient temperature range	15.81	°C
Daily total insolation factor	3.45	kWh/m ² /day
Tank paint colour	Aluminum/Specular	NA
Tank paint solar absorbance	0.39	NA
FINAL OUTPUT:	Result	Unit
Breathing losses:	0.71 kg/month	
Working losses:	0.04 kg/month	
TOTAL LOSSES (Total TVOC Emissions for the month):	0.75 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 June 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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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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		Effective Date	January 2018		
		Review Date	January 2021		

APPENDIX 1: CEMS Calibration certificates



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 PO Box 328, ISANDO, SA, 1600
 VAT REG #: 421 021 2249
www.e-analytics.co.za

Tel: 0861 000 032
 Intl. Tel: +27 11 918 6994
 Fax: +27 11 994 1037
 CO REG #: 2004/007607/07
info@e-analytics.co.za

CALIBRATION CERTIFICATE


CERTIFICATE NO:
3501

CUSTOMER:	Eskom Medupi	JOB NO:	SC1713
CONTACT NAME:	Lerato Sehume	TEL:	078 012 9038
MODEL:	Dr Fodisch MGA 23	SERIAL NO:	15711
AUXILIARY EQUIPMENT:	Unit 2		


CHAN	PRIOR	FINAL	TEST GAS	TEST GAS VALUE	GAS CERTIFICATE NUMBER	EXPIRY DATE
CO	Zero	-1 ppm	0 ppm	Air	20.95 %	N/A
	Span	834 ppm	835 ppm	CO	836.4 ppm	P20FO00332 2021-02-03
NO	Zero	-2 ppm	0 ppm	Air	20.95 %	N/A
	Span	884 ppm	877 ppm	NO	876.7 ppm	P20FO00346 2021-01-21
SO2	Zero	-75 ppm	0	Air	20.95 %	N/A
	Span	2102 ppm	2200 ppm	SO2	2200.0 ppm	P20FO00345 2021-02-21
O2	Zero	0.04 %	0.00 %	N2	99.99 %	92520 2021-02-27
	Span	21.10 %	20.95 %	Air	20.95 %	N/A

REPORT: Inspect all sample lines, filters and coolers, filter elements need to be change. Calibrate analyser with zero and span gas, calibration was done according to cylinder values, analyser was responding to all test gas.


Date of Calibration: 25 May 2020
Calibration Due Date: Aug 2020
Technician: J. Faber



Document Number: TH-PFC-002-F1 Rev 2



A Teledyne Technologies Company



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 Fax: +27 11 994 1037
 CO REG #: 2004/007607/07
info@e-analytics.co.za

CALIBRATION CERTIFICATE


CERTIFICATE NO:
3503

CUSTOMER:	Eskom Medupi	JOB NO:	SC1713
CONTACT NAME:	Lerato Sehume	TEL:	078 012 9038
MODEL:	Dr Fodisch MGA 23	SERIAL NO:	15711
AUXILIARY EQUIPMENT:	Unit 4		


CHAN	PRIOR	FINAL	TEST GAS	TEST GAS VALUE	GAS CERTIFICATE NUMBER	EXPIRY DATE
CO	Zero	1 ppm	0 ppm	Air	20.95 %	N/A
	Span	828 ppm	835 ppm	CO	836.4 ppm	P20FO00332 2021-02-03
NO	Zero	-2 ppm	0 ppm	Air	20.95 %	N/A
	Span	864 ppm	877 ppm	NO	876.7 ppm	P20FO00346 2021-01-21
SO2	Zero	-13 ppm	0	Air	20.95 %	N/A
	Span	2129 ppm	2200 ppm	SO2	2200.0 ppm	P20FO00345 2021-02-21
O2	Zero	-0.00 %	0.00 %	N2	99.99 %	92520 2021-02-27
	Span	20.87 %	20.95 %	Air	20.95 %	N/A

REPORT: Inspect all sample lines, filters and coolers, filter element need to be change. Calibrate analyser with zero and span gas, calibration was done according to cylinder values, analyser was responding to all test gas.


Date of Calibration: 25 May 2020
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CALIBRATION CERTIFICATE


CERTIFICATE NO:
3502

CUSTOMER:	Eskom Medupi	JOB NO:	SC1713
CONTACT NAME:	Lerato Sehume	TEL:	078 012 9038
MODEL:	Dr Fodisch MGA 23	SERIAL NO:	15712
AUXILIARY EQUIPMENT:	Unit 3		


CHAN	PRIOR	FINAL	TEST GAS	TEST GAS VALUE	GAS CERTIFICATE NUMBER	EXPIRY DATE
CO	Zero	2 ppm	0 ppm	Air	20.95 %	N/A
	Span	829 ppm	835 ppm	CO	836.4 ppm	P20FO00332 2021-02-03
NO	Zero	9 ppm	0 ppm	Air	20.95 %	N/A
	Span	866 ppm	877 ppm	NO	876.7 ppm	P20FO00346 2021-01-21
SO2	Zero	4 ppm	0	Air	20.95 %	N/A
	Span	2021 ppm	2200 ppm	SO2	2200.0 ppm	P20FO00345 2021-02-21
O2	Zero	-0.01 %	0.00 %	N2	99.99 %	92520 2021-02-27
	Span	20.35 %	20.95 %	Air	20.95 %	N/A

REPORT: Inspect all sample lines, filters and coolers, filter element need to be change. Calibrate analyser with zero and span gas, calibration was done according to cylinder values, analyser was responding to all test gas.

Date of Calibration: 25 May 2020
Calibration Due Date: Aug 2020
Technician: J. Faber



Document Number: TH-PFC-002-F1 Rev 2



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Medupi Power Station Monthly Emissions Report

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CALIBRATION CERTIFICATE

CERTIFICATE NO:

3504

CUSTOMER:	Eskom Medupi	JOB NO:	SC1713
CONTACT NAME:	Lerato Sehume	TEL:	078 012 9038
MODEL:	Dr Fodisch MGA 23	SERIAL NO:	13670
AUXILIARY EQUIPMENT:	Unit 5		

CHAN	PRIOR	FINAL	TEST GAS	TEST GAS VALUE	GAS CERTIFICATE NUMBER	EXPIRY DATE	
CO	Zero	6 ppm	0 ppm	Air	20.95 %	N/A	
	Span	848 ppm	835 ppm	CO	836.4 ppm	P20FO00332	2021-02-03
NO	Zero	4 ppm	0 ppm	Air	20.95 %	N/A	
	Span	885 ppm	877 ppm	NO	876.7 ppm	P20FO00346	2021-01-21
SO2	Zero	-40 ppm	0	Air	20.95 %	N/A	
	Span	2079 ppm	2200 ppm	SO2	2200.0 ppm	P20FO00345	2021-02-21
O2	Zero	0.02 %	0.00 %	N2	99.99 %	92520	2021-02-27
	Span	20.49 %	20.95 %	Air	20.95 %	Air	N/A

REPORT: Inspect all sample lines, filters and coolers, filter elements need to be change. Calibrate analyser with zero and span gas, calibration was done according to cylinder values, analyser was responding to all test gas.

Date of Calibration:
25 May 2020
Calibration Due Date:
Aug 2020
Technician:
J. Faber



Document Number: TH-PFC-002-F1 Rev 2



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CALIBRATION CERTIFICATE

CERTIFICATE NO:

3505

CUSTOMER:	Eskom Medupi	JOB NO:	SC1713
CONTACT NAME:	Lerato Sehume	TEL:	078 012 9038
MODEL:	Dr Fodisch MGA 23	SERIAL NO:	13689
AUXILIARY EQUIPMENT:	Unit 6		

CHAN	PRIOR	FINAL	TEST GAS	TEST GAS VALUE	GAS CERTIFICATE NUMBER	EXPIRY DATE	
CO	Zero	-0 ppm	0 ppm	Air	20.95 %	N/A	
	Span	840 ppm	835 ppm	CO	836.4 ppm	P20FO00332	2021-02-03
NO	Zero	-6 ppm	0 ppm	Air	20.95 %	N/A	
	Span	884 ppm	877 ppm	NO	876.7 ppm	P20FO00346	2021-01-21
SO2	Zero	-2 ppm	0	Air	20.95 %	N/A	
	Span	2462 ppm	2462 ppm	SO2	2200.0 ppm	P20FO00345	2021-02-21
O2	Zero	0.32 %	0.00 %	N2	99.99 %	92520	2021-02-27
	Span	20.63 %	20.95 %	Air	20.95 %	Air	N/A

REPORT: Inspect all sample lines, filters and coolers, filter elements need to be change. SO2 cell diagnostics is low and cell does not calibrate on cylinder value, but cell is still reacting, and O2 cell sensitivity start to go down. Calibrate analyser with zero and span gas, calibration was done according to cylinder values, analyser was responding to all test gas.

Date of Calibration:
25 May 2020
Calibration Due Date:
Aug 2020
Technician:
J. Faber



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