	Medupi Power Station Monthly Emissions Report	Template Identifier	240-43921804	Rev	6
		Document Identifier	240-88543153	Rev	2
		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 – Mar 2020 Rev1.

Dear Phumudzo

MEDUPI POWER STATION MONTHLY EMISSIONS REPORT FOR THE MONTH OF MARCH 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 March 2020 only.

1. Raw Materials and Products

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

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Unit 2,3, 4, 5 and 6 consumption March 2020
	Coal	Tons/month	1 875 000	662 052
	Fuel Oil	Tons/month	40 000	3 073
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Unit 2, 3, 4, 5 and 6 Production Rate in Month of March 2020
	Energy	MW	4 800	2206
	Ash Emitted	Tons/month	not specified	217

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	Medupi Power Station Monthly Emissions Report	Template Identifier	240-43921804	Rev	6	
		Document Identifier	240-88543153	Rev	2	
		Effective Date	January 2021			
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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- Mar -20	24,0	0,0	24,0	0,0	16,7	0.00	47	47	17233	1733,68
02- Mar -20	24,0	0,0	24,0	0,0	0,0	0.00	364	364	20010	2020,39
03- Mar -20	24,0	0,0	24,0	13,6	21,3	0.26	222	222	23009	2198,00
04- Mar -20	24,0	0,0	24,0	24,0	24,0	0.00	160	160	22675	2122,46
05- Mar -20	24,0	0,0	24,0	24,0	24,0	0.00	209	209	23917	2214,56
06- Mar -20	24,0	0,0	24,0	24,0	14,4	1.03	17	18	22664	2252,77
07- Mar -20	24,0	0,0	24,0	24,0	0,0	0.00	158	158	24980	2380,36
07- Mar -20	24,0	0,0	3,1	24,0	23,6	0.05	74	74	21001	2430,82
09- Mar -20	24,0	0,0	0,0	24,0	24,0	0.00	9	9	18285	1686,52
10- Mar -20	24,0	0,0	0,0	24,0	2,6	0.59	51	52	16023	1566,09
11- Mar -20	24,0	0,0	0,0	24,0	0,0	3.28	292	295	16870	1648,13
12- Mar -20	24,0	0,0	0,0	24,0	0,0	0.00	90	90	15577	1628,09
13- Mar -20	24,0	0,0	3,8	24,0	0,0	0.00	449	449	19528	1817,70
14- Mar -20	24,0	0,0	24,0	24,0	0,0	0.00	64	64	20470	1913,85
15- Mar -20	24,0	0,0	24,0	24,0	0,0	0.00	0	0	21011	1939,86
16- Mar -20	24,0	0,0	24,0	24,0	0,0	0.00	0	0	20511	1949,92
17- Mar -20	24,0	0,0	24,0	24,0	0,0	0.00	0	0	22310	2057,08
18- Mar -20	24,0	0,0	24,0	24,0	0,0	0.00	2	2	21424	2027,98
19- Mar -20	24,0	0,0	24,0	24,0	0,0	0.00	3	3	21175	1967,11
20- Mar -20	24,0	0,0	24,0	24,0	0,0	0.00	3	3	20875	1923,27
21- Mar -20	24,0	0,0	24,0	24,0	0,0	0.00	11	11	18631	1699,95
22- Mar -20	1,7	0,0	24,0	24,0	0,0	1.88	276	278	21698	2022,18
23- Mar -20	19,4	0,0	24,0	24,0	0,0	0.00	86	86	21148	1946,52
24- Mar -20	24,0	0,0	24,0	24,0	0,0	1.60	121	123	23481	2302,24
25- Mar -20	24,0	0,0	24,0	24,0	18,3	0.00	151	151	23824	2222,30
26- Mar -20	24,0	0,0	24,0	24,0	24,0	0.00	45	45	21910	2034,09
27- Mar -20	24,0	0,0	24,0	24,0	7,1	0.00	3	3	17976	1909,43
28- Mar -20	24,0	0,0	24,0	24,0	0,0	0.00	27	27	17719	2293,44
29- Mar -20	23,9	0,0	24,0	24,0	0,0	0.00	130	130	17742	1645,47
30- Mar -20	0,0	0,0	24,0	24,0	0,0	0.00	0	0	19781	1866,36
31- Mar -20	24,0	0,0	24,0	24,0	0,0	0.00	0	0	19100	1788,41

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		Document Identifier	240-88543153	Rev	2	
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2. Abatement Technology

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

Associated Unit/Stack	Technology Type	Efficiency
Unit 1	<i>Fabric Filter Plant (FFP)</i>	0
Unit 2	<i>Fabric Filter Plant (FFP)</i>	99,931%
Unit 3	<i>Fabric Filter Plant (FFP)</i>	0
Unit 4	<i>Fabric Filter Plant (FFP)</i>	99,836%
Unit 5	<i>Fabric Filter Plant (FFP)</i>	99,878%
Unit 6	<i>Fabric Filter Plant (FFP)</i>	99,863%

3. Energy Source Characteristics

Table 4: Energy Source Material Characteristics for the month of March 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	1.55
Ash Content	35 - 39	34.52

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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Effective Date	January 2021		
Review Date	January 2024		

Figure 2: Medupi Unit 2 PM Emissions - March 2020

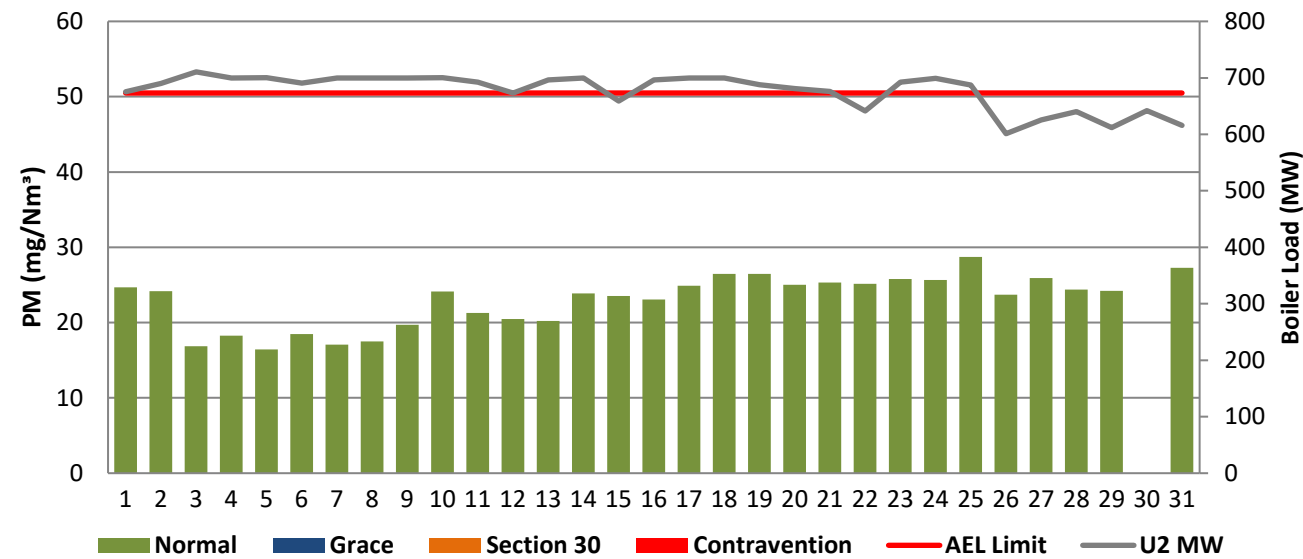


Figure 4: Medupi Unit 4 PM Emissions - March 2020

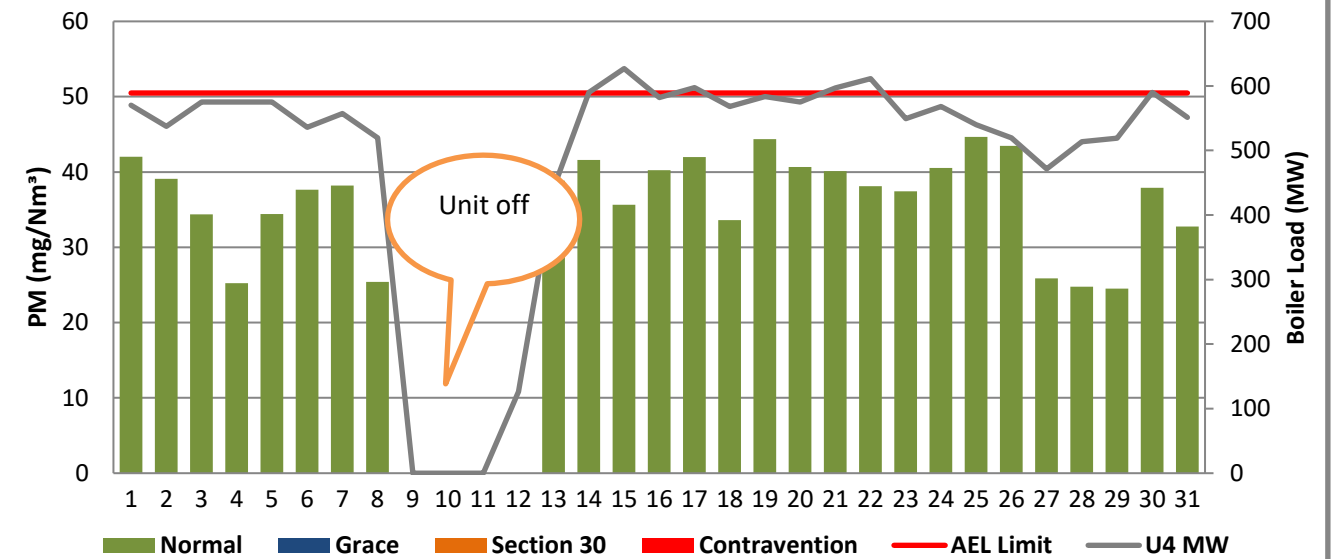


Figure 5: Medupi Unit 5 PM Emissions - March 2020

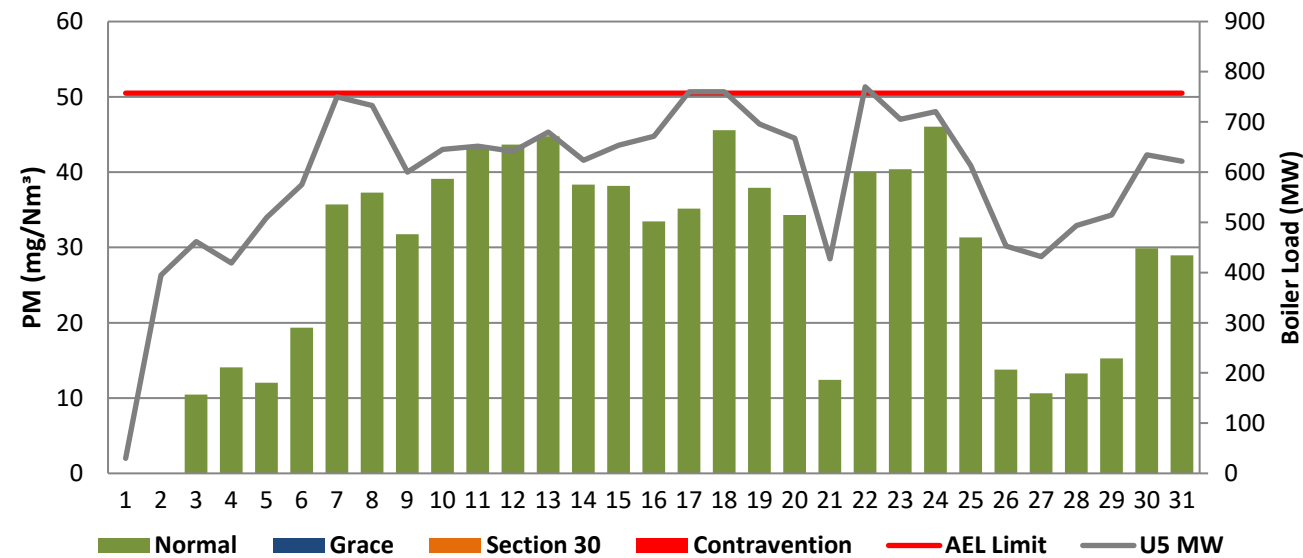
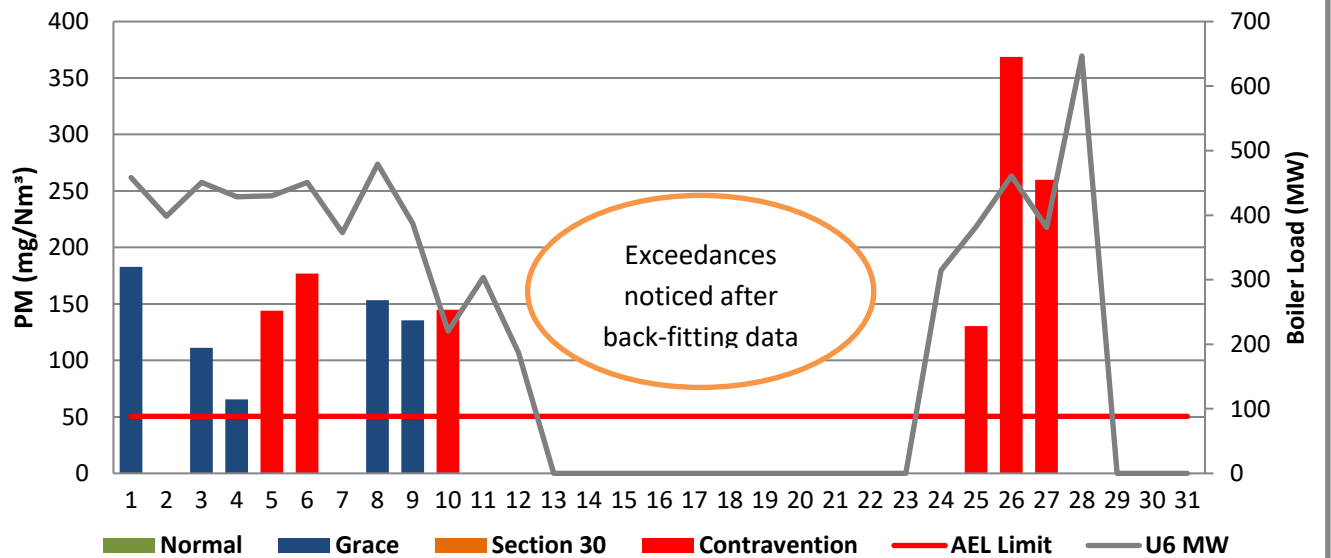


Figure 6: Medupi Unit 6 PM Emissions - March 2020



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Medupi Power Station Monthly Emissions Report

Template Identifier	240-43921804	Rev	6
Document Identifier	240-88543153	Rev	2
Effective Date	January 2021		
Review Date	January 2024		

Figure 8: Medupi Unit 2 SOx Emissions - March 2020

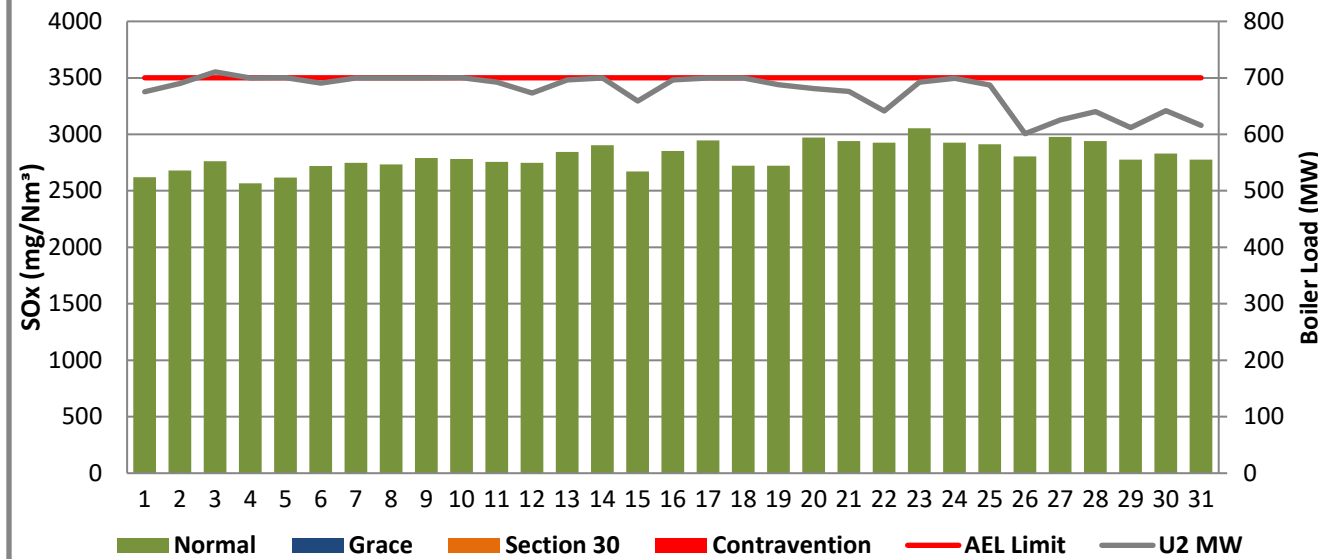


Figure 10: Medupi Unit 4 SOx Emissions - March 2020

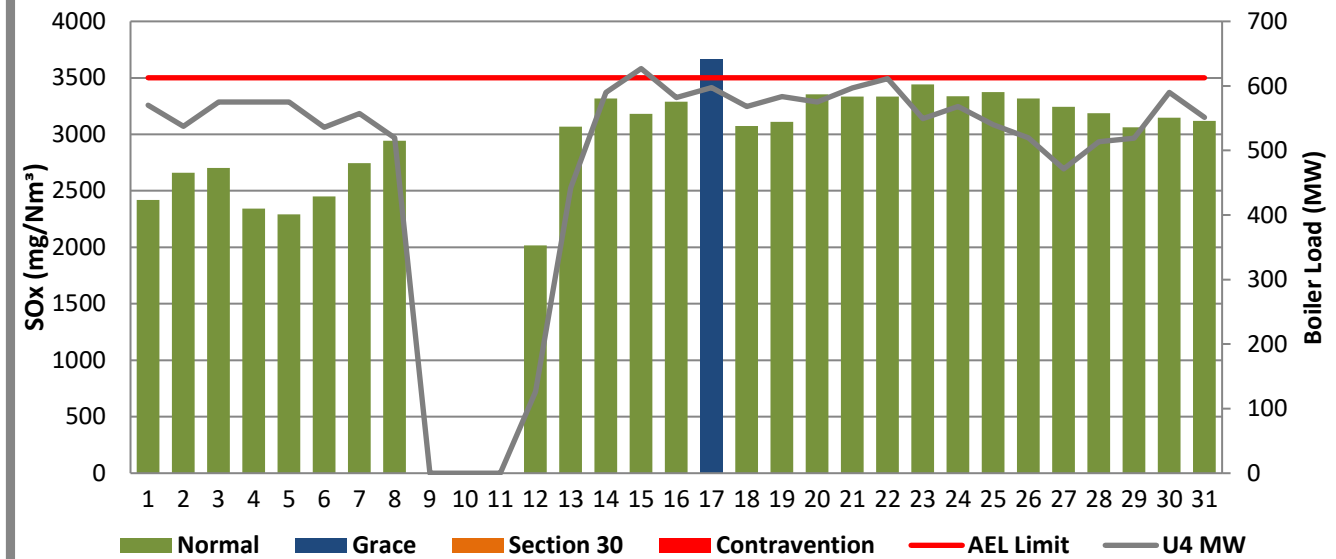


Figure 11: Medupi Unit 5 SOx Emissions - March 2020

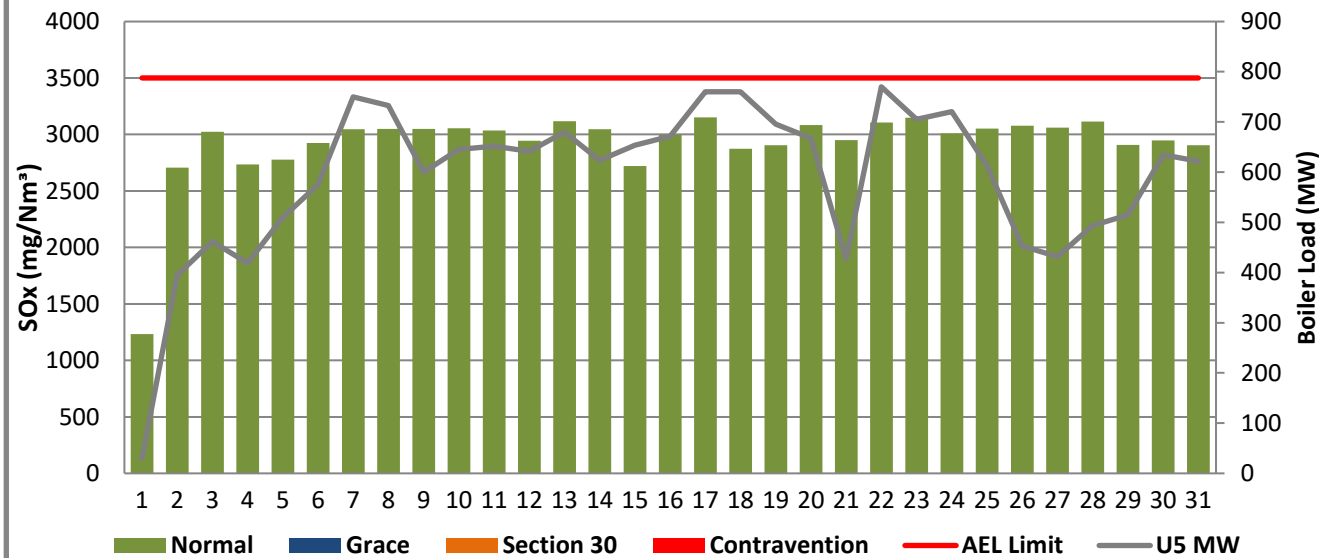
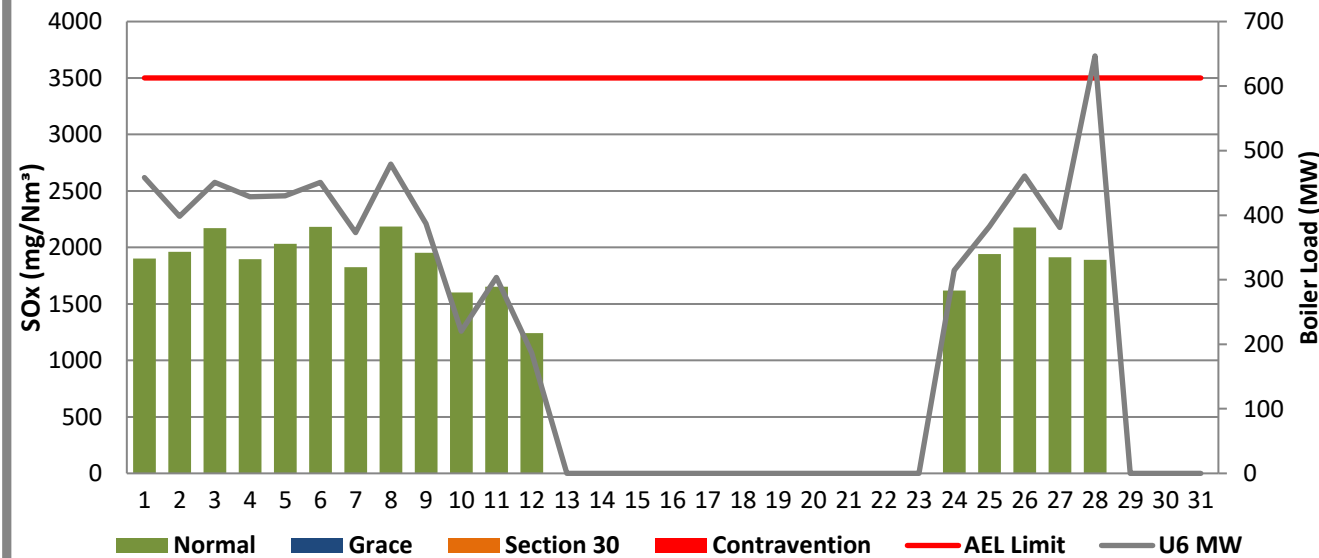


Figure 12: Medupi Unit 6 SOx Emissions - March 2020



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Template Identifier	240-43921804	Rev	6
Document Identifier	240-88543153	Rev	2
Effective Date	January 2021		
Review Date	January 2024		

Figure 14: Medupi Unit 2 NOx Emissions - March 2020

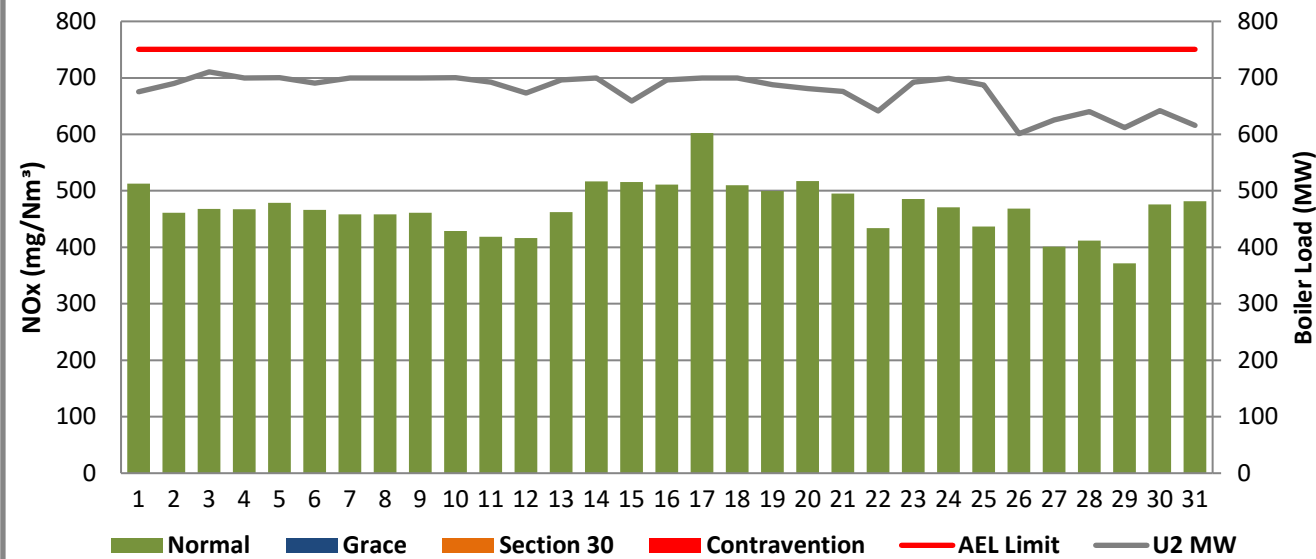


Figure 16: Medupi Unit 4 NOx Emissions - March 2020

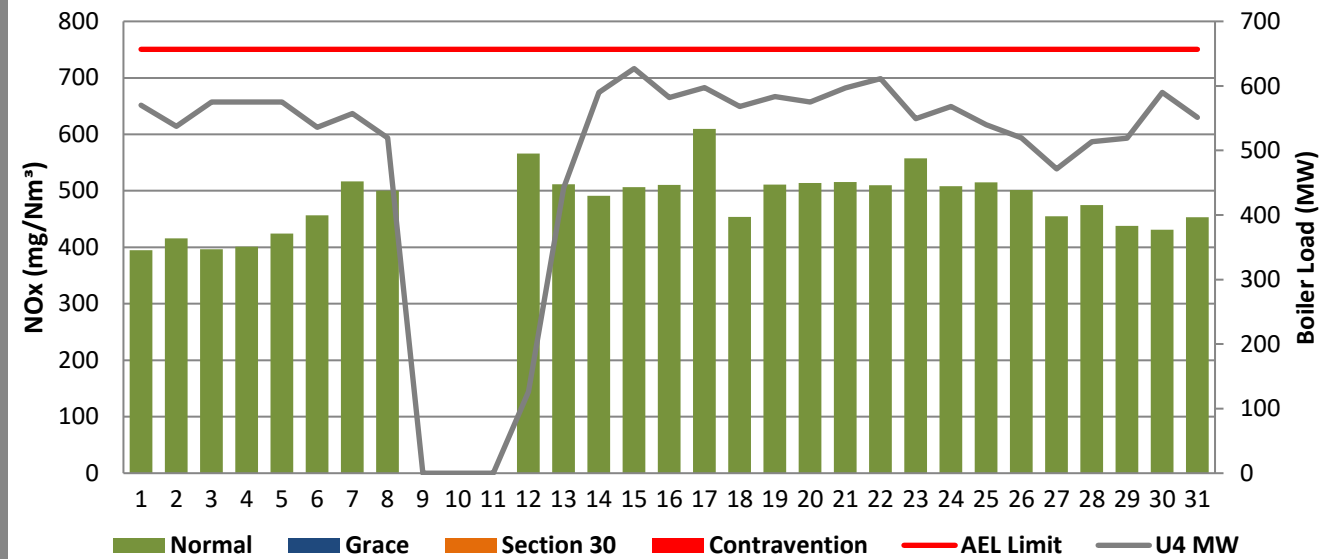


Figure 17: Medupi Unit 5 NOx Emissions - March 2020

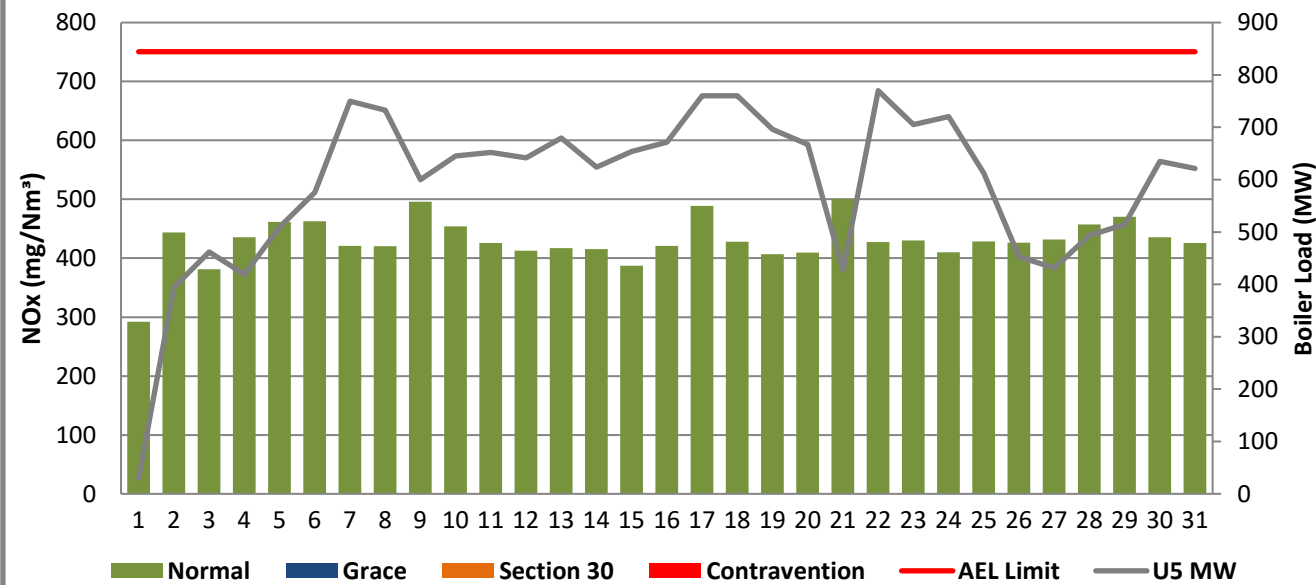
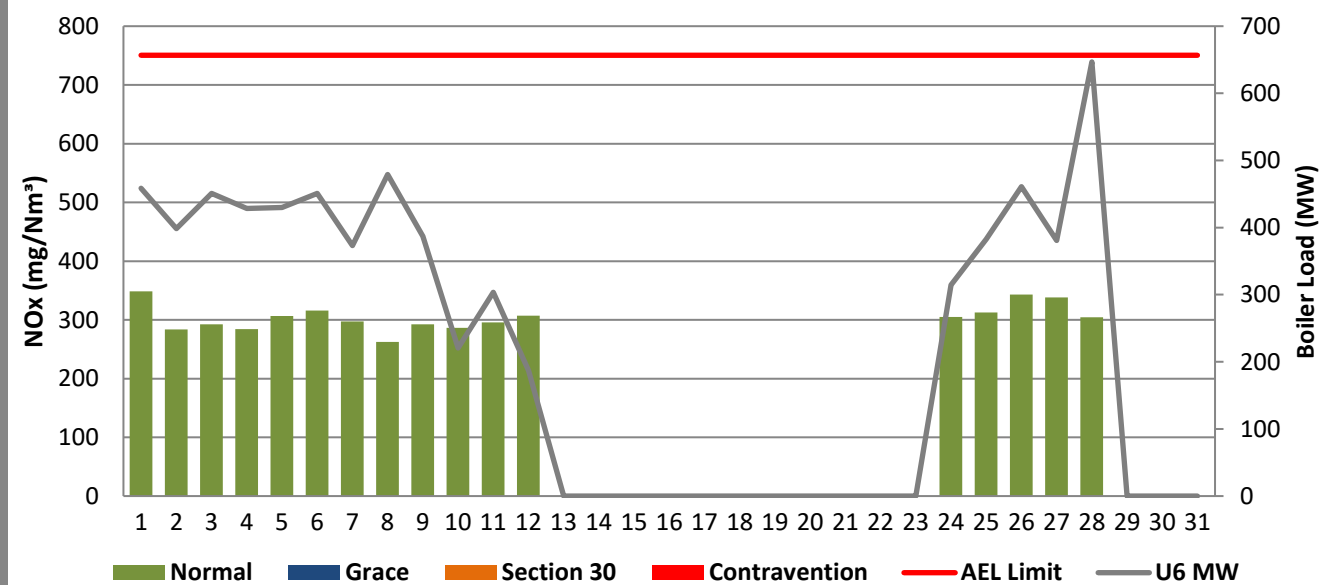


Figure 18: Medupi Unit 6 NOx Emissions - March 2020



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		Document Identifier	240-88543153	Rev	2
		Effective Date	January 2021		
		Review Date	January 2024		

Table 5: Monthly tonnages for the month of March 2020

Associated Unit/Stack	PM	SO ₂	NO ₂	CO
Unit 1	0.0	0	0	0
Unit 2	52,6	6 690	1 122	34
Unit 3	0,0	0	0	0
Unit 4	54,6	4 678	734	26
Unit 5	68,3	6 567	951	22
Unit 6	41,4	731	113	8
SUM	217,0	18 666	2 919	91

5. Comments on the performance and availability of each unit

Gaseous emissions on all units were within the limit for March reporting period. PM emission exceedances recorded for the month of March was at unit 6, these exceedances were picked during back-fitting of data and are reported as contraventions. The exceedances are linked to damaged bag from the PJFF plant.

6. Continuous Emission Monitoring Systems (CEMS)

Unit 2, 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	Data for the reporting period is available

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	Medupi Power Station Monthly Emissions Report	Template Identifier	240-43921804	Rev	6
		Document Identifier	240-88543153	Rev	2
		Effective Date	January 2021		
		Review Date	January 2024		

Table 7: CEMS Monitor Reliability

Associated Unit/Stack	PM	SO ₂	NO _x	O ₂
Unit 2	98,3	98,1	98,0	97,8
Unit 4	99,9	96,8	96,8	96,1
Unit 5	100,0	96,8	96,8	96,4
Unit 6	99,6	86,9	57,0	39,0

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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	Medupi Power Station Monthly Emissions Report	Template Identifier	240-43921804	Rev	6
		Document Identifier	240-88543153	Rev	2
		Effective Date	January 2021		
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Table 8: Total Volatile Organic Compound (TVOC) for March 2020

		
CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS*		
Date:	31 March 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:	March	
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:	3073	tons/month
Molecular weight of the fuel oil:	166.00	Lb/lb-mole
METEROLOGICAL DATA FOR THE MONTH	Data	Unit
Daily average ambient temperature	23.67	°C
Daily maximum ambient temperature	30.21	°C
Daily minimum ambient temperature	17.89	°C
Daily ambient temperature range	12.31	°C
Daily total insolation factor	5.08	kWh/m ² /day
Tank paint colour	Aluminum/Specular	NA
Tank paint solar absorbance	0.39	NA
FINAL OUTPUT:	Result	Unit
Breathing losses:	0.68 kg/month	
Working losses:	0.09 kg/month	
TOTAL LOSSES (Total TVOC Emissions for the month):	0.77 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, 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.</small>		

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		Document Identifier	240-88543153	Rev	2
		Effective Date	January 2021		
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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 March 2019

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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		Document Identifier	240-88543153	Rev	2
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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)


APPENDIX 1: CEMS Calibration certificates

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CO REG #: 2004/007607/07
info@e-analytics.co.za


CALIBRATION CERTIFICATE

		CERTIFICATE NO:	
		3416	
CUSTOMER:	Eskom Medupi	JOB NO:	SC1885
CONTACT NAME:	Lerato Sehume	PHONE:	078 012 9038
MODEL:	Dr Fodisch MGA 23	SERIAL NO:	13669
AUXILIARY EQUIPMENT:	Unit 6		


CHAN		PRIOR	FINAL	TEST GAS	TEST GAS VALUE	GAS CERTIFICATE NUMBER	EXPIRY DATE
1	ZERO	1 ppm	0 ppm	Air	21.0 %	Air	N/A
	SPAN	834 ppm	835 ppm	CO	834.6 ppm	3204	03-02-2021
2	ZERO	-2 ppm	0 ppm	Air	21.0 %	Air	N/A
	SPAN	908 ppm	877 ppm	NO	876.7 ppm	12598	21-01-2021
3	ZERO	-47 ppm	0 ppm	Air	21.0 %	Air	N/A
	SPAN	2584 ppm	2584 ppm	SO2	2161.7 ppm	5905E	15-05-2020
4	ZERO	0.03 %	0.0 %	N2	99.99 %	82410	31-08-2020
	SPAN	20.39 %	20.95 %	O2	20.95 %	Air	N/A

REPORT: SO2 cell diagnostics is low and cell module should be inspected. Inspect all sample lines, filters and rotameter. Calibrate analyser with zero and span gas, calibration was done according to cylinder standards, analyser was responding to all test gas.

Date of Calibration: 25 Feb 2020
Calibration Due Date: May 2020
Technician: J Faber



Biatar + Lang
SERVOMEX
A TRADE MARK COMPANY
Document Number: TH-PFC-002-F1 Rev 2





TELEDYNE
ANALYTICAL INSTRUMENTS
A Teledyne Technologies Company

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Fax: +27 11 894 1037
CO REG #: 2004/007607/07
info@e-analytics.co.za

CALIBRATION CERTIFICATE


CERTIFICATE NO:
3415

CUSTOMER:	Eskom Medupi	JOB NO:	SC1665
CONTACT NAME:	Lerato Sehume	PHONE:	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	
1	ZERO	3 ppm	0 ppm	Air	21.0 %	N/A	
	SPAN	856 ppm	835 ppm	CO	834.6 ppm	3204	03-02-2021
2	ZERO	0 ppm	0 ppm	Air	21.0 %	N/A	
	SPAN	944 ppm	877 ppm	NO	876.7 ppm	12598	21-01-2021
3	ZERO	-19 ppm	0 ppm	Air	21.0 %	N/A	
	SPAN	2262 ppm	2262 ppm	SO2	2161.7 ppm	5905E	15-05-2020
4	ZERO	0.06 %	0.0 %	N2	99.99 %	82410	31-08-2020
	SPAN	20.69 %	20.95 %	O2	20.95 %	Air	N/A

REPORT: SO2 cell diagnostics is low and cell module should be inspected. Inspect all sample lines, filters and rotameter. Calibrate analyser with zero and span gas, calibration was done according to cylinder standards, analyser was responding to all test gas.

Date of Calibration: 25 Feb 2020
Calibration Due Date: May 2020
Technician: J Faber



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SERVOMEX
A METROHM COMPANY
Document Number: TH-PFC-002-F1 Rev 2





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A Teledyne Technologies Company

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	Medupi Power Station Monthly Emissions Report	Template Identifier	240-43921804	Rev	6
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CO REG #: 2004/007607/07
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CALIBRATION CERTIFICATE

		CERTIFICATE NO:	
		3414	
CUSTOMER:	Eskom Medupi	JOB NO:	SC1885
CONTACT NAME:	Lerato Sehume	PHONE:	078 012 9038
MODEL:	Dr Fodisch MGA 23	SERIAL NO:	13668
AUXILIARY EQUIPMENT:	Unit 4		


CHAN		PRIOR	FINAL	TEST GAS	TEST GAS VALUE	GAS CERTIFICATE NUMBER	EXPIRY DATE
1	ZERO	1 ppm	0 ppm	Air	21.0 %	Air	N/A
	SPAN	846 ppm	835 ppm	CO	834.6 ppm	3204	03-02-2021
2	ZERO	-1 ppm	0 ppm	Air	21.0 %	Air	N/A
	SPAN	920 ppm	877 ppm	NO	876.7 ppm	12598	21-01-2021
3	ZERO	-31 ppm	0 ppm	Air	21.0 %	Air	N/A
	SPAN	2384 ppm	2384 ppm	SO2	2161.7 ppm	5905E	15-05-2020
4	ZERO	0.07 %	0.0 %	N2	99.99 %	82410	31-08-2020
	SPAN	21.15 %	20.95 %	O2	20.95 %	Air	N/A

REPORT: *SO2 cell diagnostics is low and cell module should be inspected. Inspect all sample lines, filters and rotameter. Calibrate analyser with zero and span gas, calibration was done according to cylinder standards, analyser was responding to all test gas.*

Date of Calibration: 25 Feb 2020
Calibration Due Date: May 2020
Technician: J Faber



Bester + Lang
SERVOMEX
A MASTECH GROUP COMPANY
Document Number: TH-PFC-002-F1 Rev 2





TELEDYNE ANALYTICAL INSTRUMENTS
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CALIBRATION CERTIFICATE




CERTIFICATE NO:
3412



CUSTOMER:	Eskom Medupi	JOB NO:	SC1665
CONTACT NAME:	Lerato Sehume	PHONE:	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	
1	ZERO	-2 ppm	0 ppm	Air	21.0 %	Air	N/A
	SPAN	839 ppm	835 ppm	CO	834.6 ppm	3204	03-02-2021
2	ZERO	-4 ppm	0 ppm	Air	21.0 %	Air	N/A
	SPAN	856 ppm	877 ppm	NO	876.7 ppm	12598	21-01-2021
3	ZERO	-38 ppm	0 ppm	Air	21.0 %	Air	N/A
	SPAN	2220 ppm	2220 ppm	SO2	2161.7 ppm	5905E	15-05-2020
4	ZERO	0.14 %	0.0 %	N2	99.99 %	82410	31-08-2020
	SPAN	21.11 %	20.95 %	O2	20.95 %	Air	N/A

REPORT: SO2 cell diagnostics is low and cell module should be replaced in future. Inspect all sample lines, filters and rotameter. Calibrate analyser with zero and span gas, calibration was done according to cylinder standards, analyser was responding to all test gas.

Date of Calibration: 25 Feb 2020
Calibration Due Date: May 2020
Technician: J Faber




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



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