	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 – Apr 2020 Rev.1

Dear Phumudzo

MEDUPI POWER STATION MONTHLY EMISSIONS REPORT FOR THE MONTH OF APRIL 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 April 2020 only.

1. Raw Materials and Products

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

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Unit 2,3, 4, 5 and 6 consumption April 2020
	Coal	Tons/month	1 875 000	498 337
	Fuel Oil	Tons/month	40 000	3757.0
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Unit 2, 3, 4, 5 and 6 Production Rate in Month of April 2020
	Energy	MW	4 800	2072
	Ash Emitted	Tons/month	not specified	156

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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- Apr -20	24,0	0,0	24,0	24,0	0,0	0	14	14	19100	1684
02- Apr -20	24,0	0,0	24,0	21,2	0,0	0	23	23	18409	1637
03- Apr -20	24,0	0,0	24,0	0,0	0,0	0	10	10	17931	1175
04- Apr -20	24,0	0,0	24,0	0,0	0,0	0	13	13	13341	1208
05- Apr -20	24,0	0,0	24,0	0,0	0,0	0	21	21	13621	1128
06- Apr -20	24,0	0,0	24,0	0,0	0,0	0	0	0	13050	1107
07- Apr -20	24,0	0,0	24,0	0,0	0,0	0	91	91	12625	1115
07- Apr -20	24,0	0,0	24,0	0,0	0,0	0	285	285	12493	1558
09- Apr -20	24,0	0,0	24,0	12,7	0,0	0	90	90	15482	1736
10- Apr -20	24,0	0,0	24,0	24,0	0,0	0	32	32	18922	1623
11- Apr -20	15,3	0,0	24,0	24,0	0,0	0	12	12	18112	1633
12- Apr -20	0,0	0,0	24,0	24,0	0,0	0	132	132	15858	1285
13- Apr -20	0,0	0,0	24,0	24,0	0,0	0	569	569	13147	1283
14- Apr -20	0,0	0,0	24,0	24,0	0,0	0	620	620	12728	1398
15- Apr -20	0,0	0,0	24,0	24,0	0,0	0	0	0	12607	1059
16- Apr -20	0,0	0,0	24,0	24,0	0,0	0	40	40	11503	1063
17- Apr -20	0,0	0,0	24,0	24,0	0,0	0	8	8	11475	1061
18- Apr -20	0,0	0,0	24,0	24,0	0,0	0	0	0	11776	1840
20- Apr -20	13,0	0,0	24,0	24,0	0,0	0	437	437	15833	1912
20- Apr -20	24,0	0,0	24,0	8,6	0,0	0	190	190	20642	1958
21- Apr -20	24,0	18,3	24,0	0,0	0,0	0	63	63	19351	1635
22- Apr -20	24,0	24,0	24,0	0,0	0,0	0	18	18	19943	1762
23- Apr -20	24,0	24,0	24,0	0,0	0,0	0	34	34	20565	1779
24- Apr -20	24,0	24,0	24,0	0,0	0,0	0	11	11	20720	1768
25- Apr -20	20,8	24,0	0,0	0,0	0,0	0	4	4	14565	2426
26- Apr -20	0,0	24,0	23,9	0,0	0,0	0	73	73	15055	1655
27- Apr -20	20,4	24,0	24,0	0,0	0,0	0	130	130	18538	1587
28- Apr -20	24,0	24,0	16,9	0,0	0,0	0	172	172	17324	1593
29- Apr -20	24,0	24,0	0,0	0,0	0,0	0	444	444	16482	1780
30- Apr -20	24,0	24,0	0,0	8,6	0,0	0	220	220	17014	2126

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2. Abatement Technology

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

Associated Unit/Stack	Technology Type	Efficiency
Unit 1	<i>Fabric Filter Plant (FFP)</i>	-
Unit 2	<i>Fabric Filter Plant (FFP)</i>	99,787%
Unit 3	<i>Fabric Filter Plant (FFP)</i>	99,999%
Unit 4	<i>Fabric Filter Plant (FFP)</i>	99,732%
Unit 5	<i>Fabric Filter Plant (FFP)</i>	99,955%
Unit 6	<i>Fabric Filter Plant (FFP)</i>	-

3. Energy Source Characteristics

Table 4: Energy Source Material Characteristics for the month of April 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	1.430
Ash Content	35 - 39	34.800

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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Figure 2: Medupi Unit 2 PM Emissions - April 2020

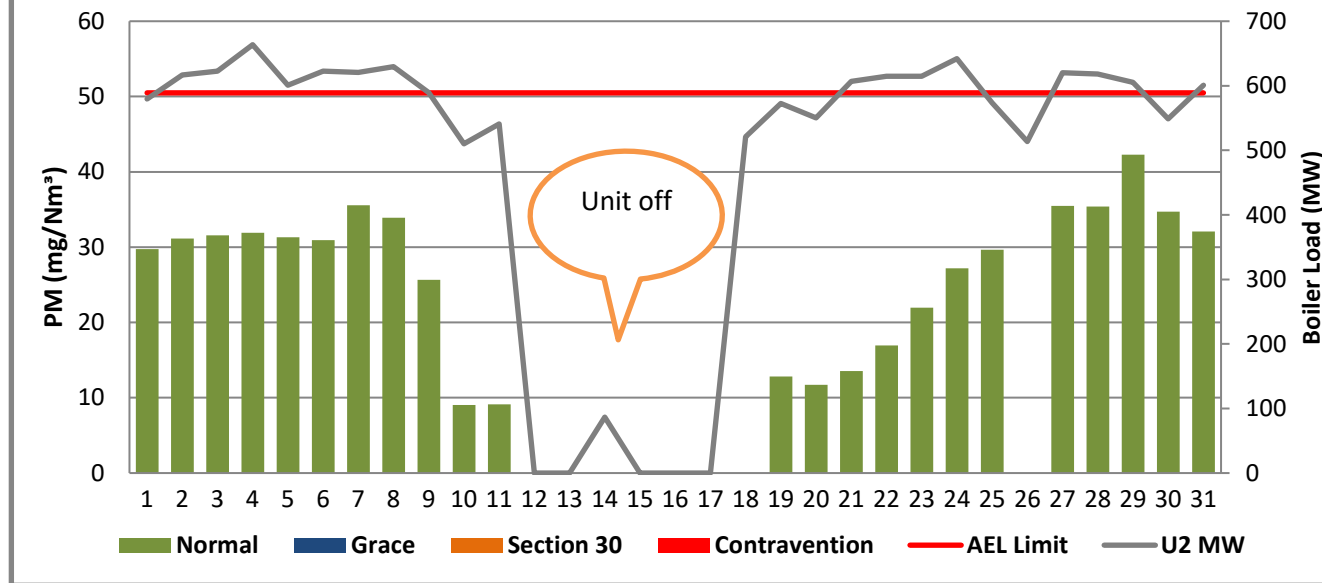


Figure 3: Medupi Unit 3 PM Emissions - April 2020

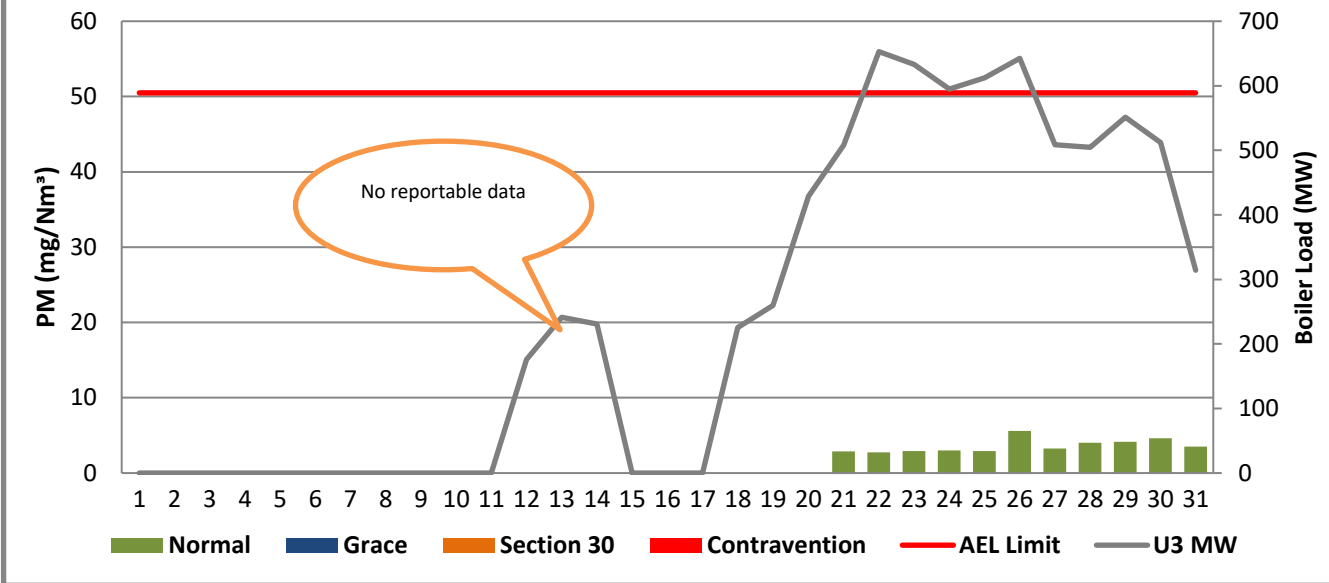


Figure 4: Medupi Unit 4 PM Emissions - April 2020

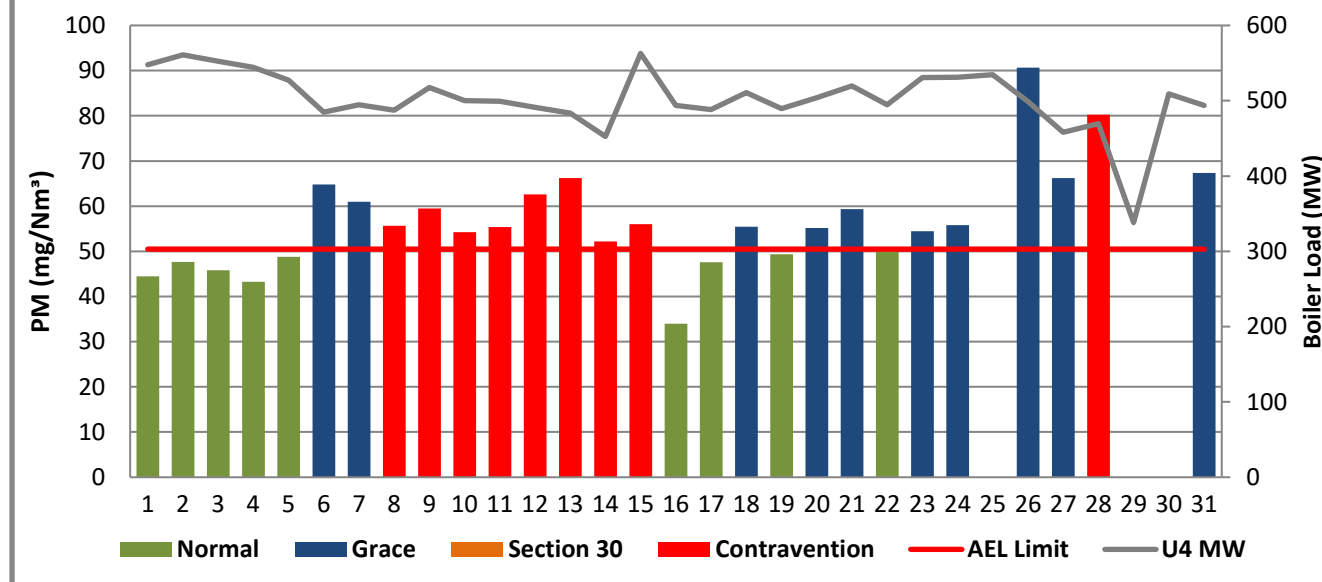
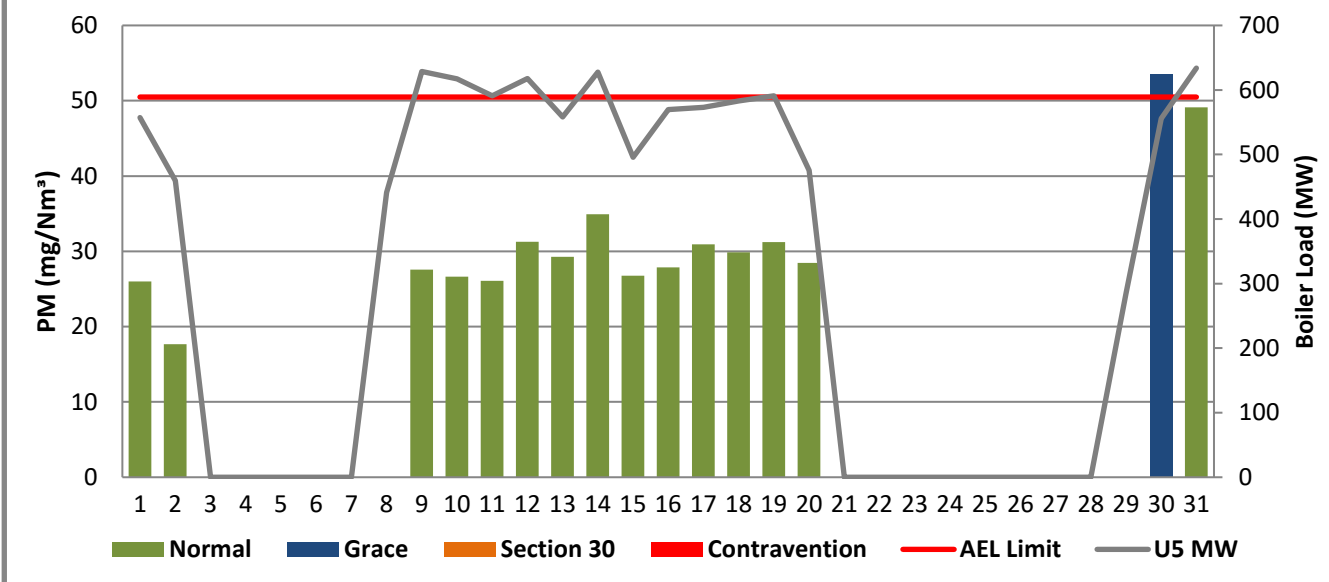


Figure 5: Medupi Unit 5 PM Emissions - April 2020



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Figure 8: Medupi Unit 2 SOx Emissions - April 2020

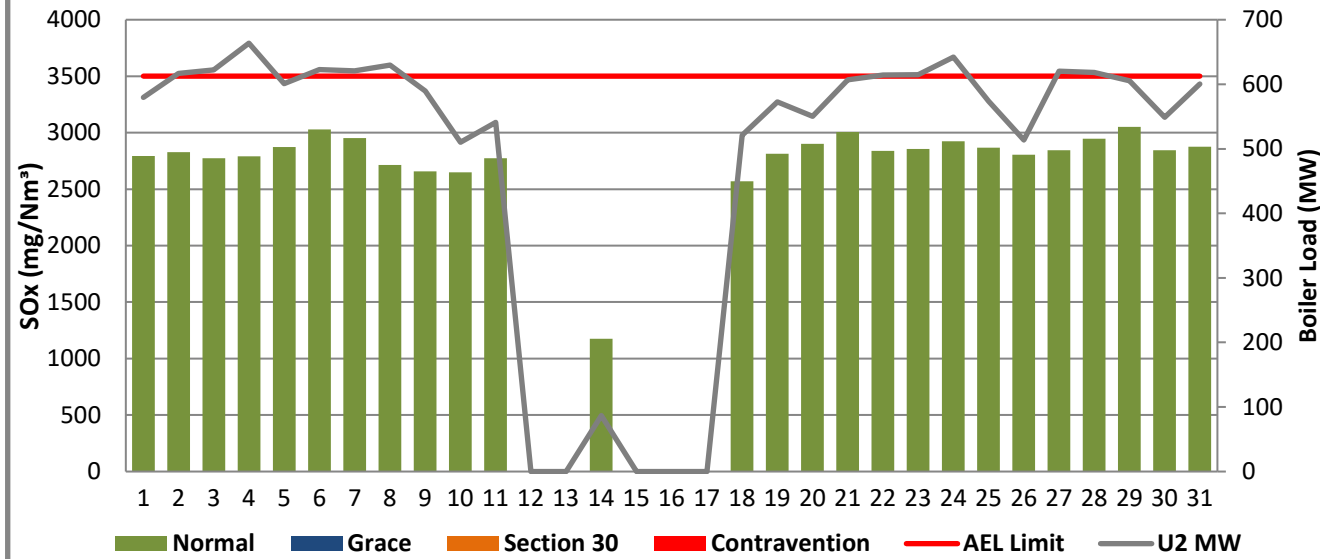


Figure 9: Medupi Unit 3 SOx Emissions - April 2020

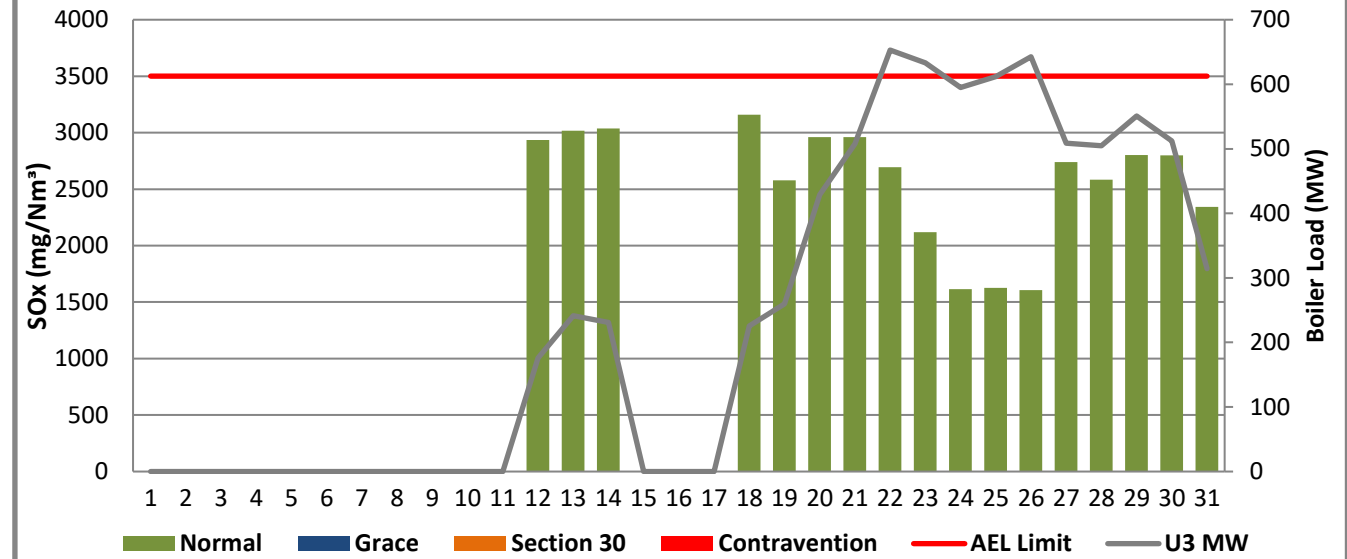


Figure 10: Medupi Unit 4 SOx Emissions - April 2020

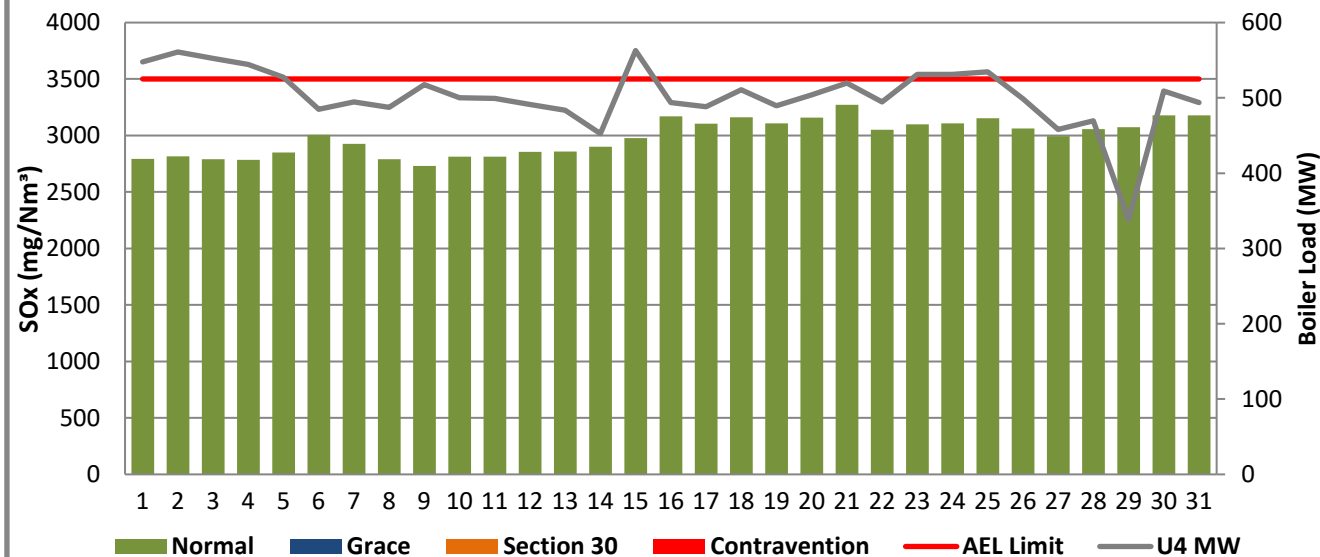
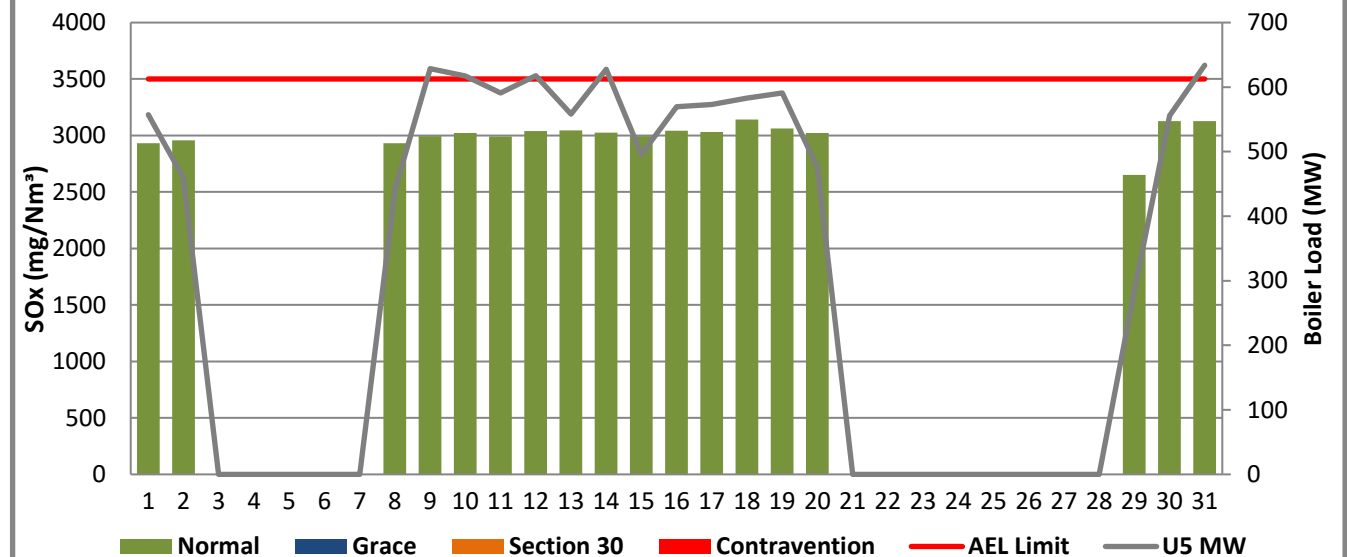


Figure 11: Medupi Unit 5 SOx Emissions - April 2020



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Figure 14: Medupi Unit 2 NOx Emissions - April 2020

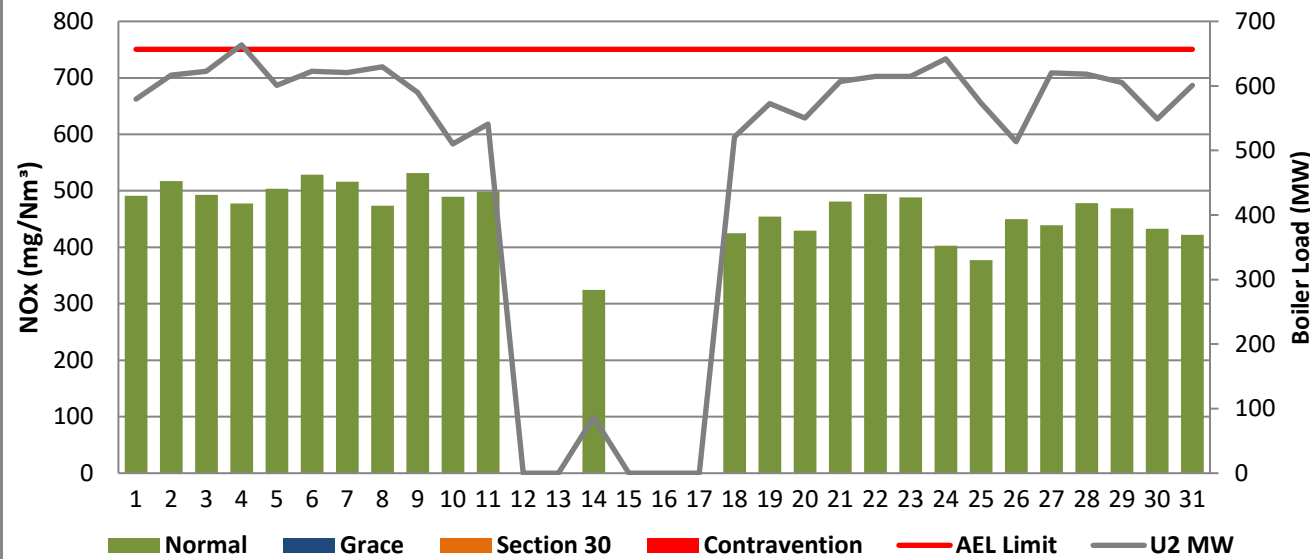


Figure 15: Medupi Unit 3 NOx Emissions - April 2020

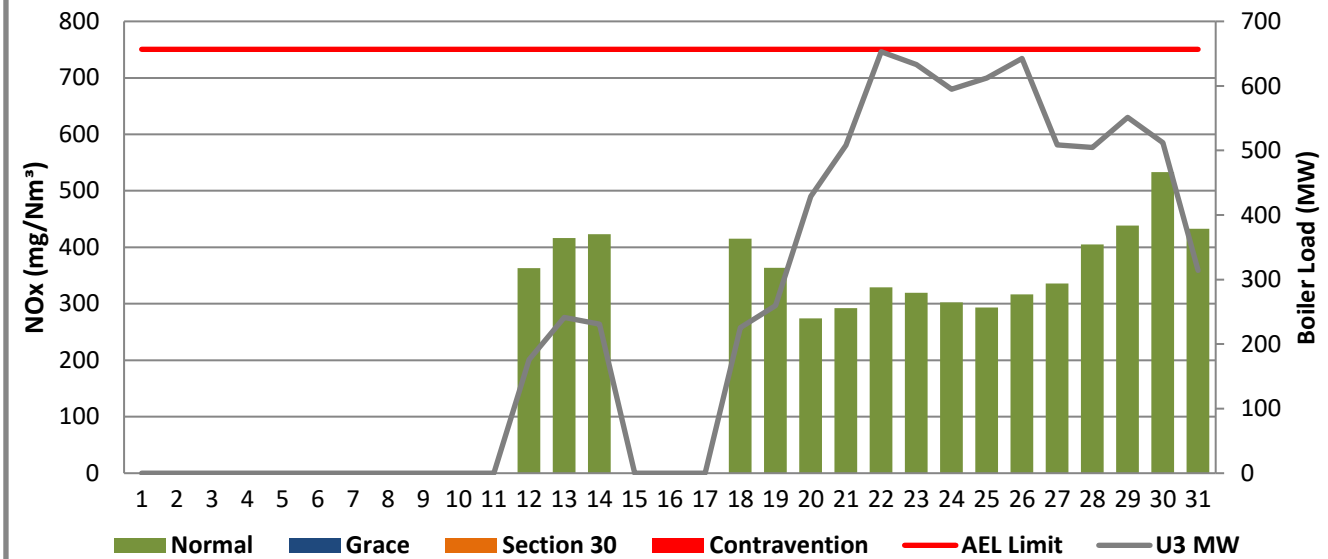


Figure 16: Medupi Unit 4 NOx Emissions - April 2020

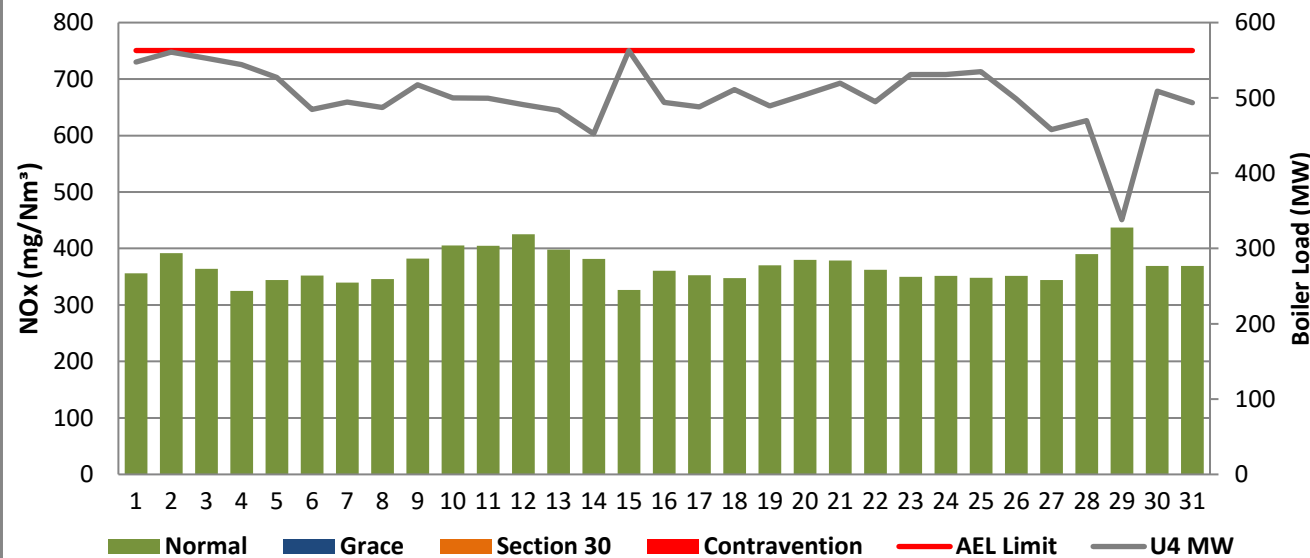
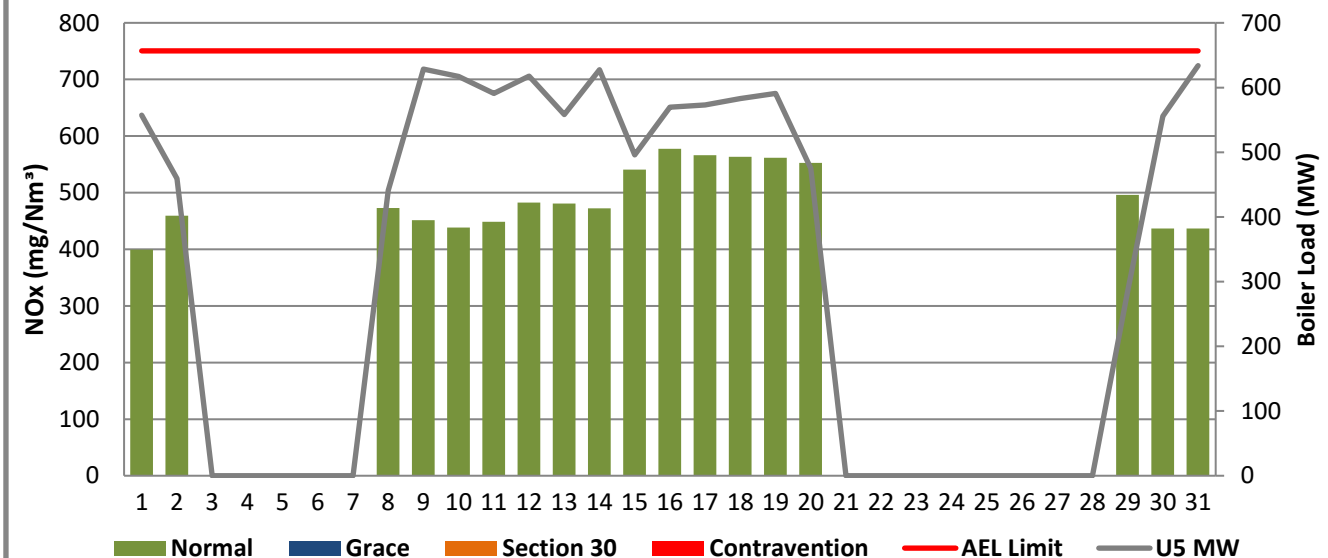


Figure 17: Medupi Unit 5 NOx Emissions - April 2020



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Table 5: Monthly tonnages for the month of April 2020

Associated Unit/Stack	PM	SO ₂	NO ₂	CO
Unit 1	-	-	-	-
Unit 2	39,7	4 280	716	19
Unit 3	1,7	1 131	169	24
Unit 4	89,2	4 738	584	48
Unit 5	25,3	2 991	487	7
Unit 6	-	-	-	-
SUM	156,0	13 140	1 956	99

5. Comments on the performance and availability of each unit

Medupi power station unit 6 was on outage for the duration of reporting period. Unit 5 had 15 day unreportable days during the month on April 2020, the unit has been off-load during this period. There was no exceedance for SO_x and NO_x at Unit 5 in the month of April 2020. Unit 5 PM limit was exceeded on the last day of April, this was categorised under grace period for light up. Unit 4 recorded 9 PM exceedances which are reported as contravention in this report, SO_x and NO_x were within the limit as prescribed by Medupi AEL.

Unit 3 SO_x and NO_x were well within the ambit of the licence during the reporting period. There were no emissions exceedances recorded in unit 3 during the reporting period.

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.

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Table 6: Periods during which CEMS was inoperative

Date	Time	CEMS status	Comments
21-31 April 2020	N/A	Unit 3 PM monitor faulty	The ball valve controlling the flow through the instrument wasn't actuating correctly preventing the extracted gas from flowing through the measuring cell.

Table 7: CEMS Monitor Reliability

Associated Unit/Stack	PM	SO ₂	NO _x	O ₂
Unit 2	99,9	99,0	99,0	95,5
Unit 3	100,0	81,7	92,2	85,8
Unit 4	99,5	99,5	99,2	99,5
Unit 5	99,1	99,2	99,0	98,1
Unit 6	-	-	-	-

7. CEMS Calibration certificates and equipment used for calibration

See attached Appendix A

8. Ambient Air Quality Monitoring Report

The ambient air data reporting of both March and April 2020 were affected by the COVID-19 lock-down. The Department of Environment, fisheries and forestry was notified of the letter dated 31 March 2020.

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 April 2019

			
CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS*			
Date:	Thursday, 30 April 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:	April		
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:		3757	tons/month
Molecular weight of the fuel oil:		166,00	Lb/lb-mole
METEROLOGICAL DATA FOR THE MONTH		Data	Unit
Daily average ambient temperature		20,60	°C
Daily maximum ambient temperature		27,37	°C
Daily minimum ambient temperature		13,11	°C
Daily ambient temperature range		10,46	°C
Daily total insolation factor		3,84	kWh/m ² /day
Tank paint colour		Aluminum/Specular	NA
Tank paint solar absorbance		0,39	NA
FINAL OUTPUT:		Result	Unit
Breathing losses:		0,61 kg/month	
Working losses:		0,11 kg/month	
TOTAL LOSSES (Total TVOC Emissions for the month):		0,72 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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10. Air quality improvements initiatives and public education and awareness campaigns

No awareness campaign.

11. Complaints Register


Table 9: Complaints for the month of April 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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Compiled by: Lufuno Tshidzumba 
Senior Environmental Advisor

Verified by: Malose Langa 
System Engineer Boiler

Supported by: Sithokozile Hlongwa 
Boiler Engineering Manager

Supported by: Rosetta Rammulla 
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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APPENDIX 1: CEMS Calibration certificates



**Elemental
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Analysers Specialists

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Tel: 0861 000 032
Intl. Tel: +27 11 918 6994
Fax: +27 11 894 1037
CO REG #: 2004/007607/07
info@e-analytics.co.za

CALIBRATION CERTIFICATE

		CERTIFICATE NO:	
		3416	
CUSTOMER:	Eskom Medupi	JOB NO:	SC1865
CONTACT NAME:	Lerato Sehume	PHONE:	078 012 9038
MODEL:	Dr Fodisch MGA 23	SERIAL NO:	13669
AUXILIARY EQUIPMENT:	Unit 8		


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



Biator + Lang
SERVOMEX
A TRADEMARK OPPORTUNITY
Document Number: TH-PFC-002-F1 Rev 2





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ANALYTICAL INSTRUMENTS
A Teledyne Technologies Company

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Intl. Tel: +27 11 918 6994
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 %	Air	N/A
	SPAN	856 ppm	835 ppm	CO	834.6 ppm	3204	03-02-2021
2	ZERO	0 ppm	0 ppm	Air	21.0 %	Air	N/A
	SPAN	944 ppm	877 ppm	NO	876.7 ppm	12598	21-01-2021
3	ZERO	-19 ppm	0 ppm	Air	21.0 %	Air	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



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





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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




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




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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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