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

Stanley Koenaitse

Waterberg District Municipality
Private Bag X1018
Modimolle
0510

skoenaite@waterberg.gov.za

Date: 2021/06/30

Enquiries: TR. Rammutla
Tel: 014 762 6375

Ref: H16/1/13-AEL/M1/R1 – Nov 2020 Rev.1

Dear Mr Koenaitse

MEDUPI POWER STATION MONTHLY EMISSIONS REPORT FOR THE MONTH OF NOVEMBER 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 November 2020 only.

1. Raw Materials and Products

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

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Unit 2, 3, 4, 5 and 6 consumption November 2020
	Coal	Tons/month	1 875 000	653 924
	Fuel Oil	Tons/month	20 000	2 700
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Unit 2, 3, 4, 5 and 6 Production Rate in Month of November 2020
	Energy	MW	4 800	2239
	Ash Emitted	Tons/month	not specified	201.1

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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-November- 20		24,0	0,0	24,0	24,0	19129		659		601	523
02-November- 20		1,3	0,0	24,0	24,0	13687		382	265	644	559
03-November- 20		0,0	6,7	24,0	24,0	16953		0	427	651	539
04-November- 20		0,0	24,0	24,0	24,0	17757		461	359	624	491
05-November- 20		7,1	24,0	24,0	24,0	21211		585	306	640	547
06-November- 20		24,0	24,0	24,0	24,0	22080		631	385	575	536
07-November- 20		24,0	24,0	24,0	24,0	23597		709	530	492	455
08-November- 20		24,0	21,8	24,0	24,0	24596		725	494	580	500
09-November- 20		24,0	0,0	24,0	24,0	21102		725	369	553	481
10-November- 20		24,0	6,6	4,4	24,0	18649		560	450	426	564
11-November- 20		24,0	0,0	11,3	24,0	18122		615	0	560	472
12-November- 20		24,0	0,0	24,0	24,0	21157		741	274	629	472
13-November- 20		24,0	12,3	24,0	24,0	25030		718	559	621	436
14-November- 20		24,0	24,0	24,0	9,9	22128		738	527	581	418
15-November- 20		24,0	24,0	24,0	2,7	22705		745	553	549	480
16-November- 20		24,0	22,7	24,0	24,0	23668		603	425	602	503
17-November- 20		24,0	0,0	24,0	24,0	24033		708	577	566	470
18-November- 20		24,0	18,9	24,0	24,0	25037		736	580	469	467
19-November- 20		24,0	24,0	24,0	24,0	26420		749	667	568	538
20-November- 20		24,0	24,0	14,7	24,0	23099		743	577	567	570
21-November- 20		24,0	24,0	1,3	24,0	25432		739	618	543	555
22-November- 20		24,0	24,0	24,0	24,0	23829		698	541	458	520
23-November- 20		24,0	24,0	24,0	24,0	20614		758	515	570	501
24-November- 20		10,2	24,0	24,0	24,0	24965		722	684	571	539
25-November- 20		0,0	24,0	22,8	24,0	25718		639	623	562	541
26-November- 20		22,0	24,0	0,0	24,0	21563		759	705	229	488
27-November- 20		24,0	24,0	6,2	24,0	24961		782	533	538	614
28-November- 20		24,0	24,0	0,8	24,0	19628		720	578	417	554
29-November- 20		24,0	24,0	0,0	24,0	19056		711	500	0	540
30-November- 20		24,0	0,7	0,0	24,0	18002		623	482	335	566

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2. Abatement Technology

Table 3: Abatement Equipment Control Technology efficiency for month of November 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)	99,905%
Unit 4	Fabric Filter Plant (FFP)	99,689%
Unit 5	Fabric Filter Plant (FFP)	99,909%
Unit 6	Fabric Filter Plant (FFP)	99,840%

3. Energy Source Characteristics

Table 4: Energy Source Material Characteristics for the month of November 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	1.28
Ash Content	35 - 39	34.35

Table 5: Energy Source Material Characteristics for the month of November 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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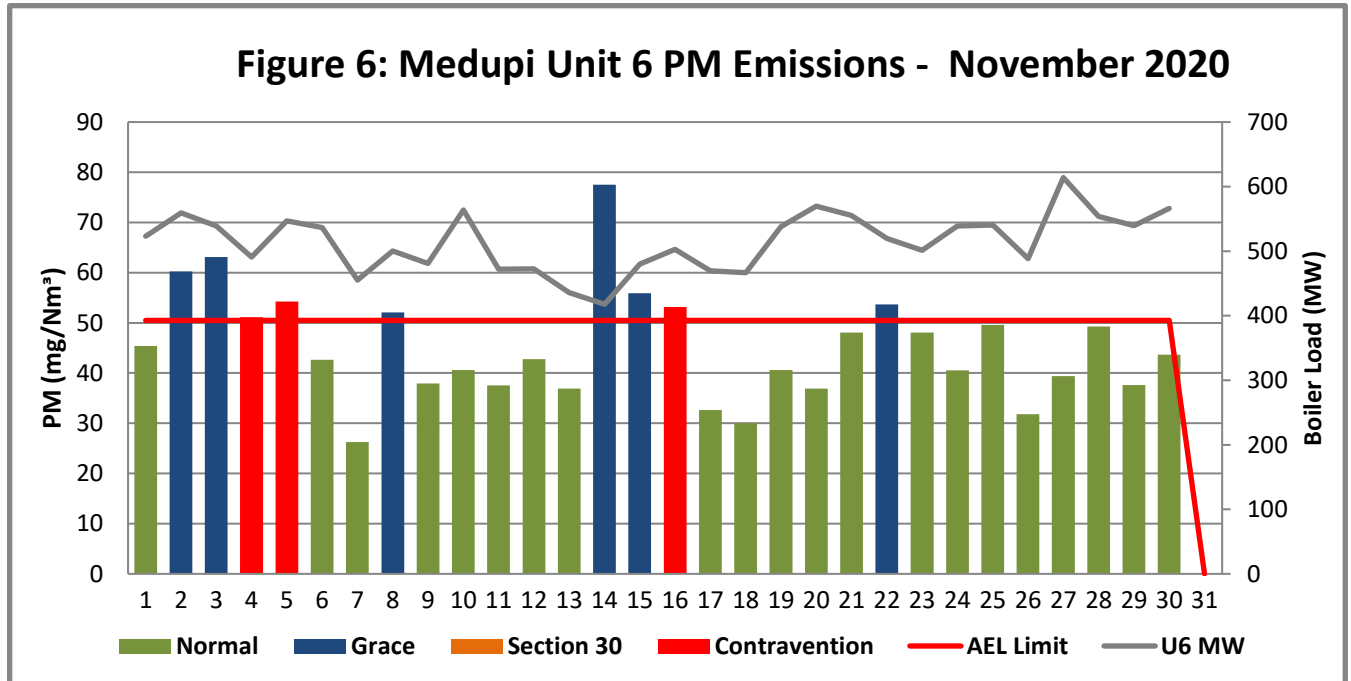
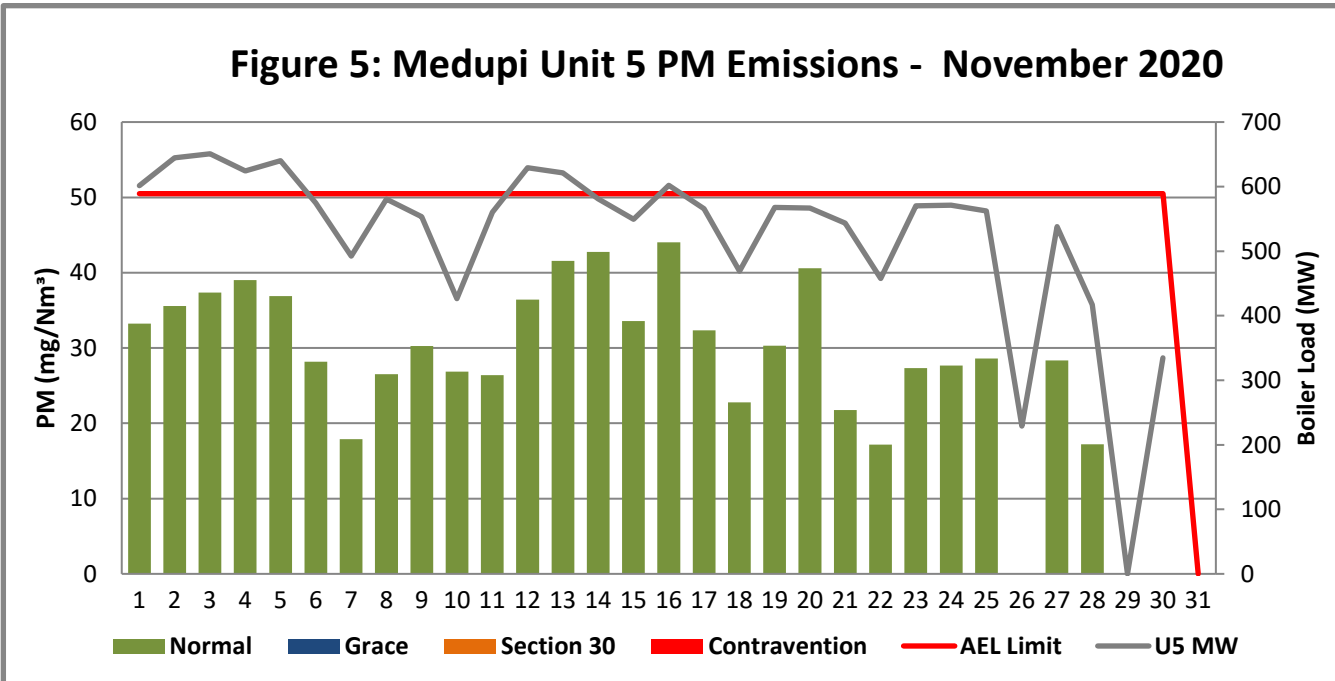
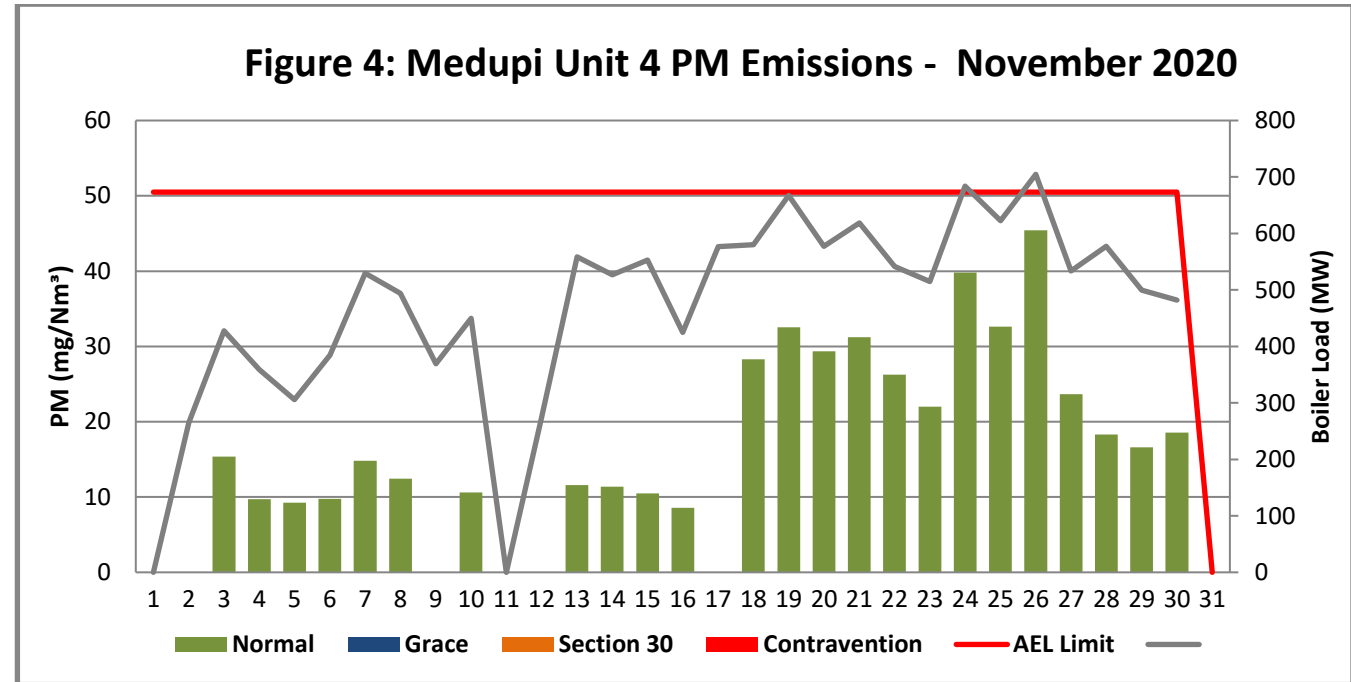
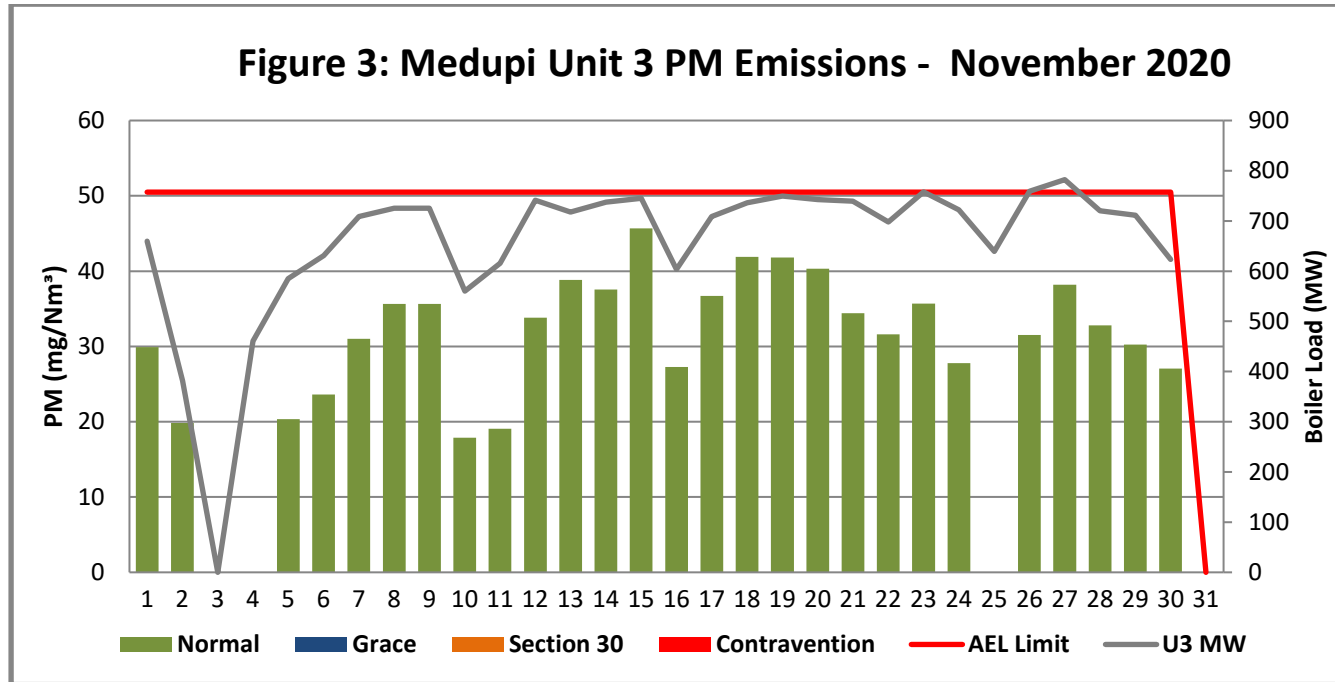
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Medupi Power Station graphical representation of the daily average emissions for particulates

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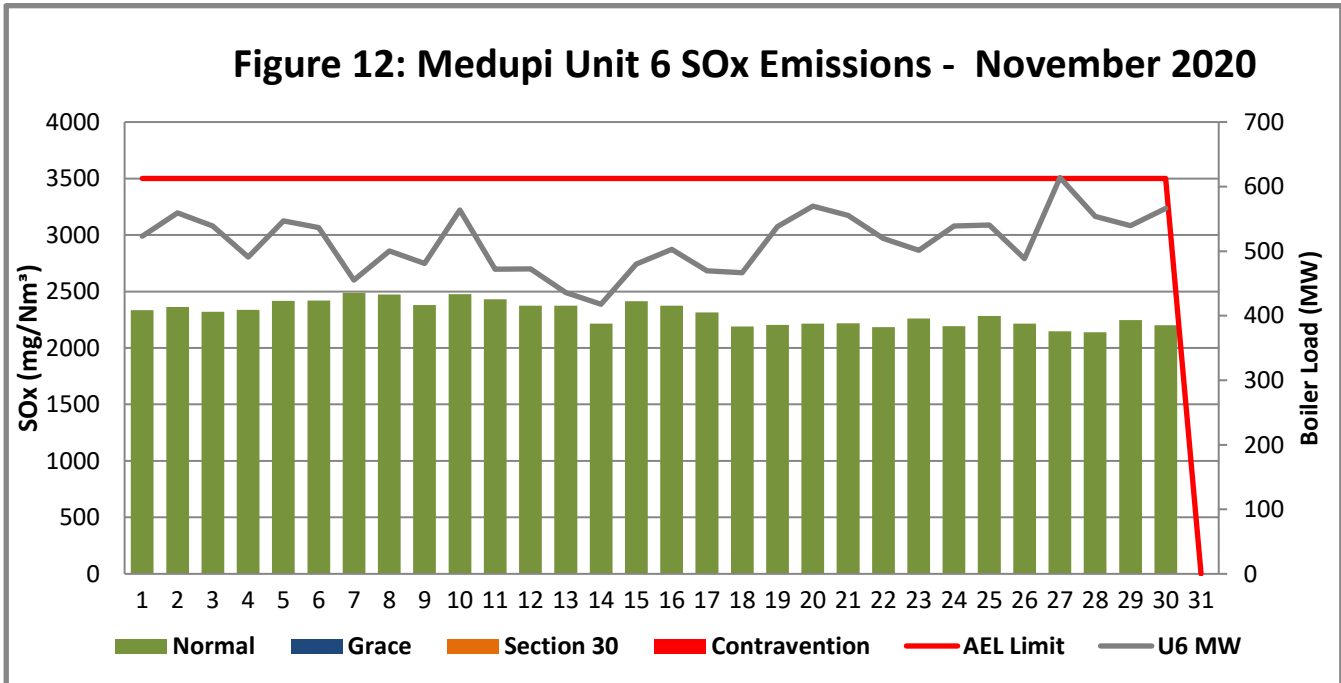
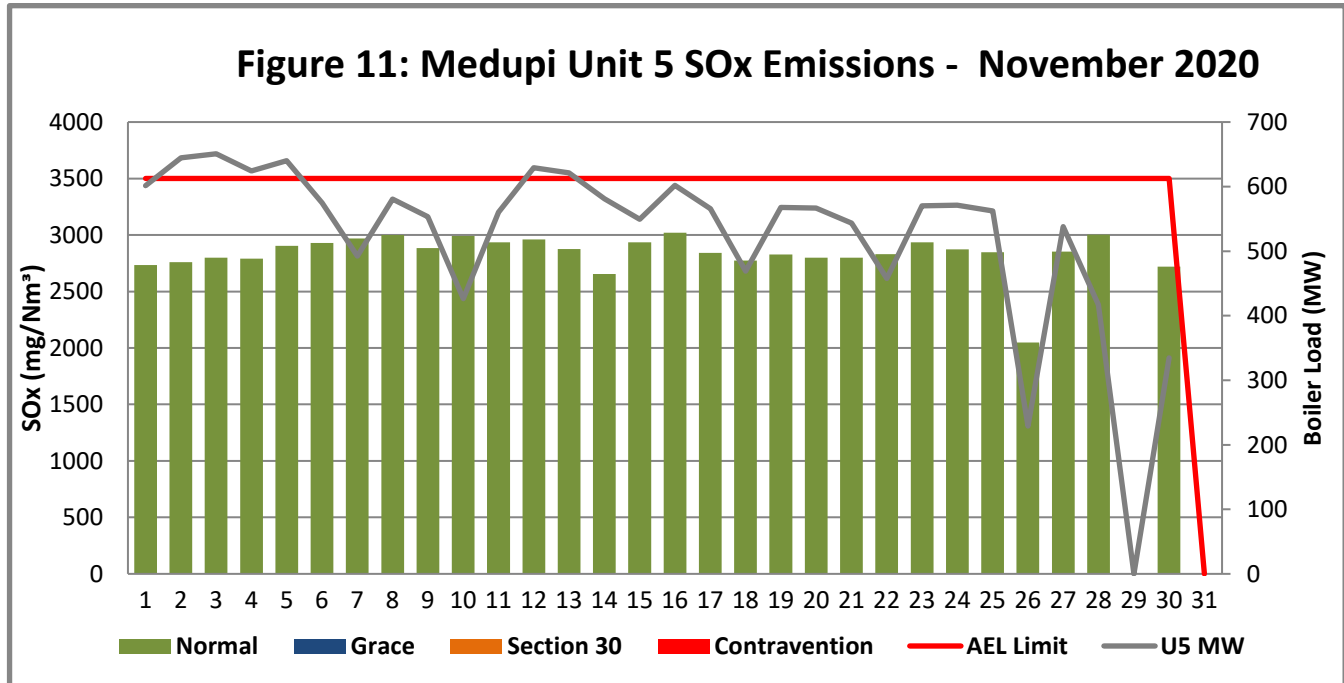
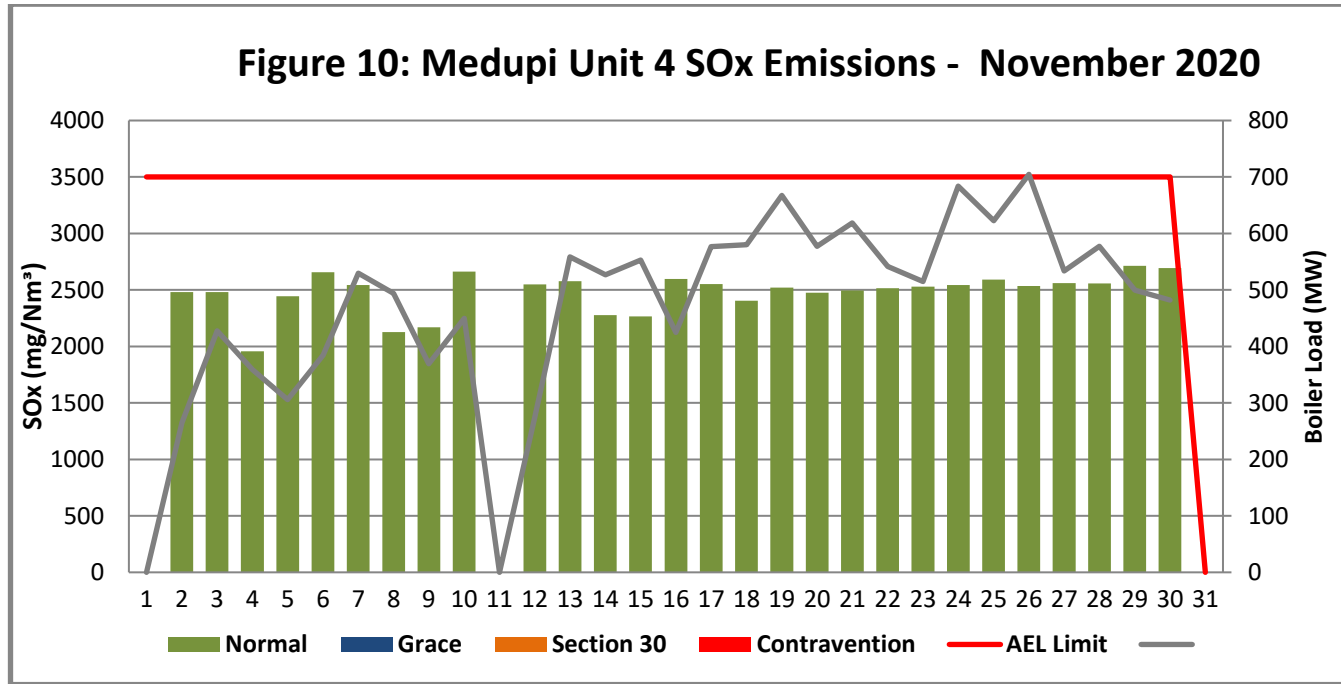
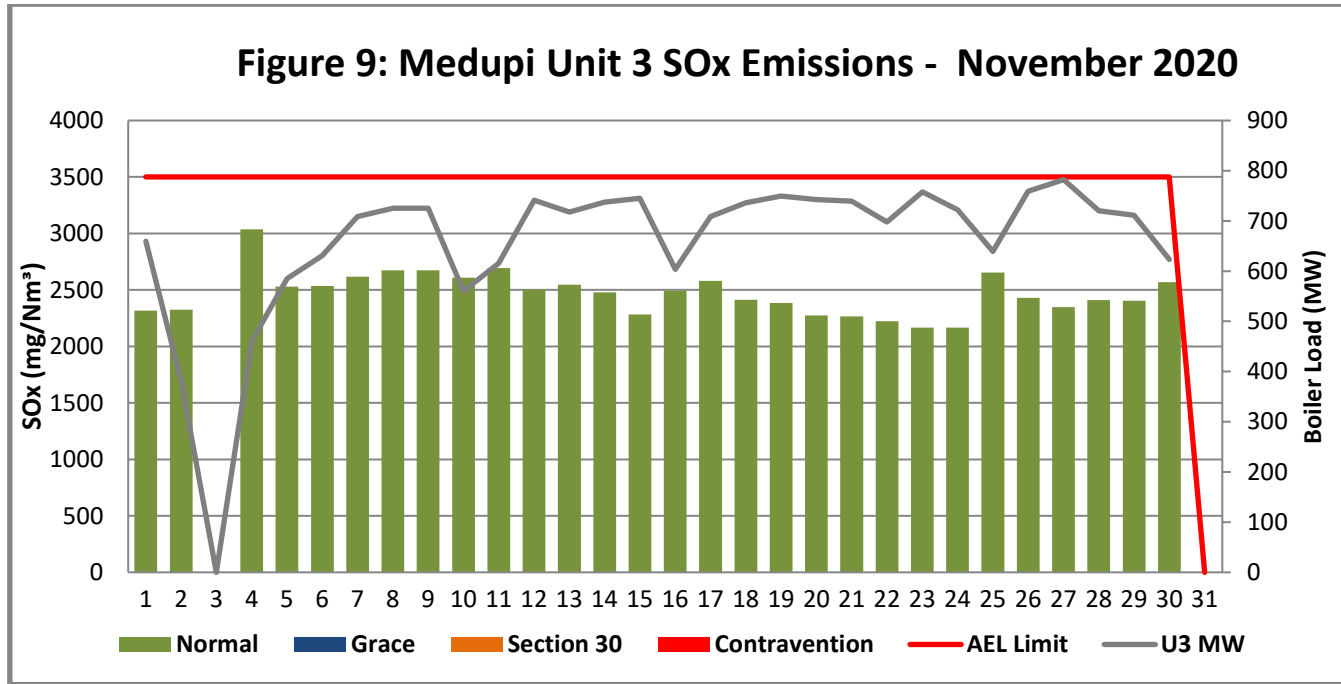
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Medupi Power Station graphical representation of the daily average emissions for NO_x and SO_x

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Figure 15: Medupi Unit 3 NOx Emissions - November 2020

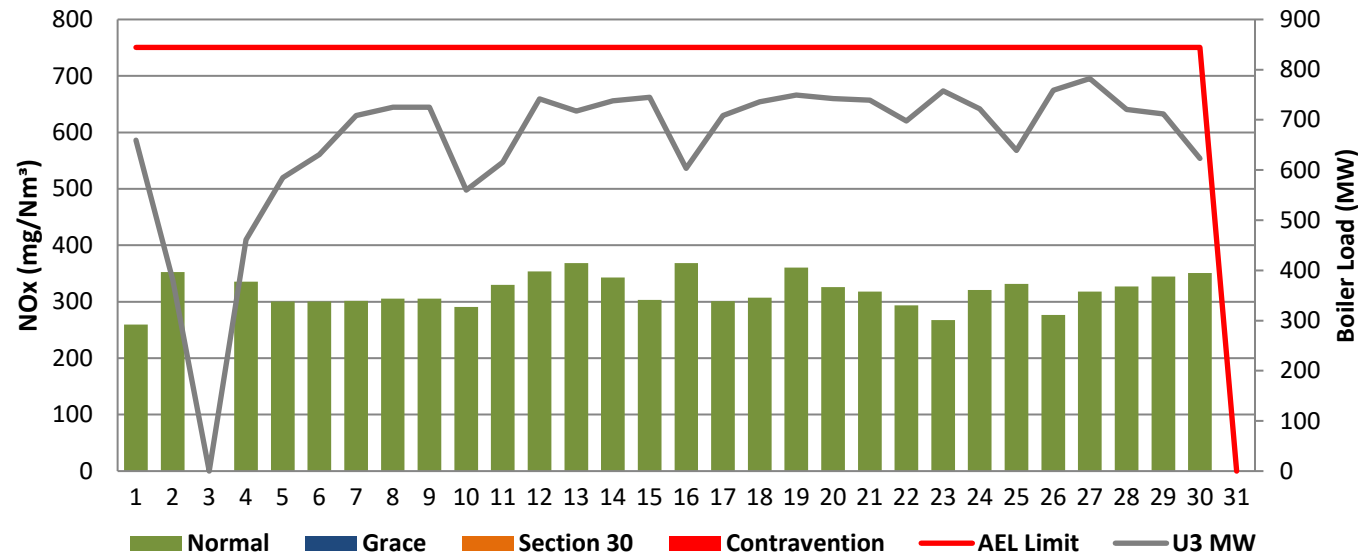


Figure 16: Medupi Unit 4 NOx Emissions - November 2020

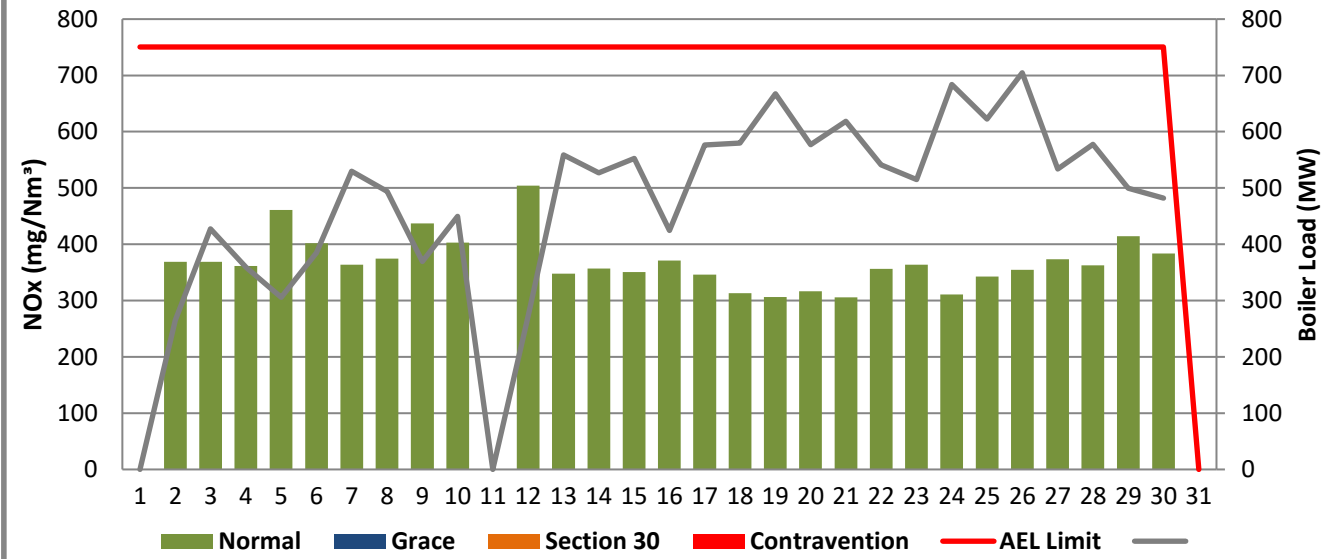


Figure 17: Medupi Unit 5 NOx Emissions - November 2020

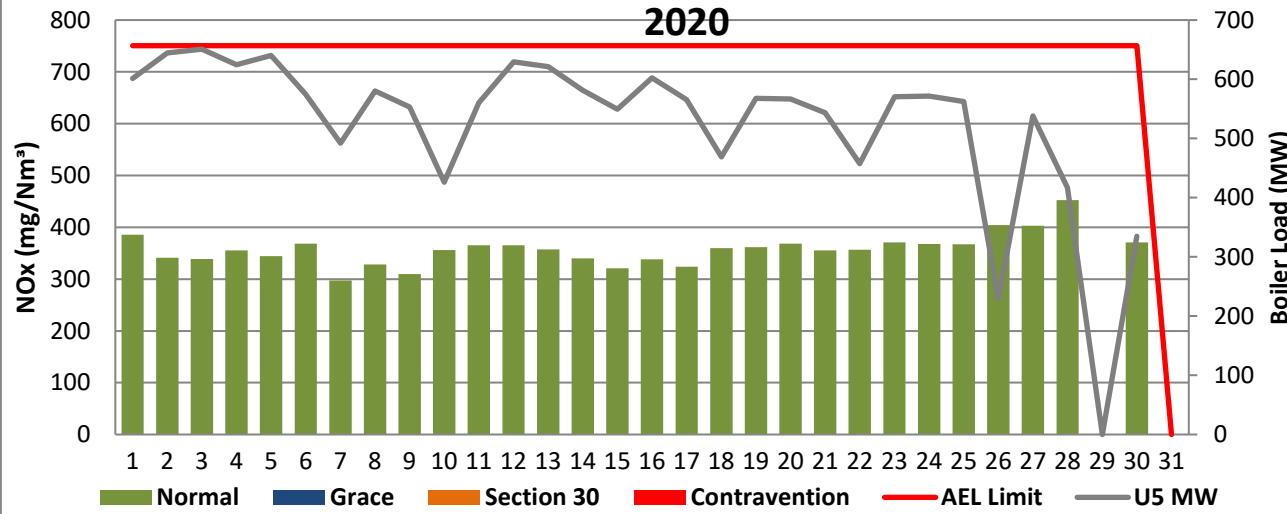
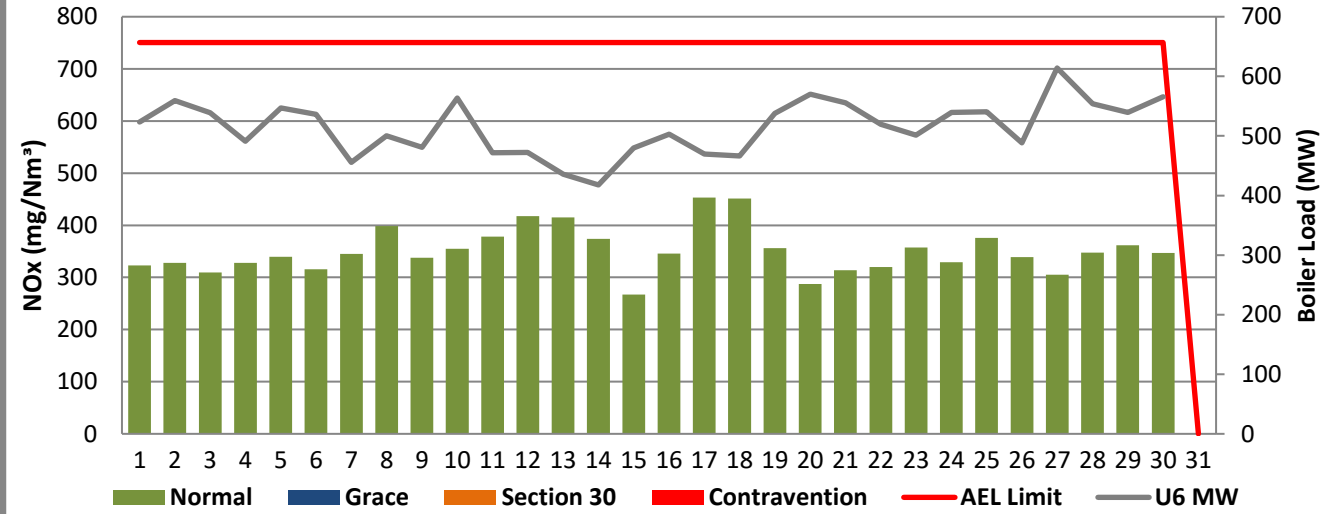


Figure 18: Medupi Unit 6 NOx Emissions - November 2020



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

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Table 7: Monthly tonnages for the month of November 2020

Unit	PM (tons)	SO ₂ (tons)	NO ₂ (tons)	CO (tons)
1	-	-	-	-
2	-	-	-	-
3	55,4	4 153	538	88
4	29,8	3 543	504	84
5	44,1	4 419	545	36
6	71,7	3 828	579	31
SUM	201,1	15 944	2 167	239

5. Comments on the performance and availability of each unit

Medupi Power station complied with the average emissions limit for SO_x and NO_x pollutants in all units during the reporting period. A total of nine PM exceedances were recorded at unit 6 for the reporting period. Three out of nine exceedances were reported as legal contravention as reflected on the figure for unit 6 above.

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	99.2	99.2	99.2	99.2
Unit 4	100.0	87.4	86.5	86.5
Unit 5	100.0	99.4	97.6	97.9
Unit 6	100.0	100.0	98.3	99.4

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, 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.


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

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CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS*		
Date:	30 November 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 align="center">MONTHLY INPUT DATA FOR THE STATION</p> <p align="center">Please only insert relevant monthly data inputs into the blue cells below</p> <p align="center">Choose from a dropdown menu in the green cells</p> <p align="center">The total VOC emissions for the month are in the red cells</p> <p align="center">IMPORTANT: Do not change any other cells without consulting the AQ CoE</p>		
MONTH:	November	
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:	2700	tons/month
Molecular weight of the fuel oil:	166.00	Lb/lb-mole
METEROLOGICAL DATA FOR THE MONTH		
	Data	Unit
Daily average ambient temperature	26.22	°C
Daily maximum ambient temperature	32.63	°C
Daily minimum ambient temperature	20.19	°C
Daily ambient temperature range	12.44	°C
Daily total insolation factor	6.14	kWh/m ² /day
Tank paint colour	Aluminum/Specular	NA
Tank paint solar absorbance	0.39	NA
FINAL OUTPUT:		
	Result	Unit
Breathing losses:	0.72 kg/month	
Working losses:	0.08 kg/month	
TOTAL LOSSES (Total TVOC Emissions for the month):	0.79 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 November 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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APPENDIX 1: CEMS Calibration certificates



Elemental Analytics
Analyser Specialists

12 Angeller Street, Bardene,
BOKSBURG, SA, 1459
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 11 894 1037
CO REG #: 2004/007607/07
info@e-analytics.co.za


CALIBRATION CERTIFICATE


						CERTIFICATE NO:	
						3641	
CUSTOMER:	Eskom Medupi			JOB NO:	SC1757		
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 %	Air	N/A
	Span	837 ppm	835 ppm	CO	836.4 ppm	P20F000332	2021-02-03
NO	Zero	-1 ppm	0 ppm	Air	20.95 %	Air	N/A
	Span	878 ppm	877 ppm	NO	876.7 ppm	P20F000346	2021-01-21
SO2	Zero	-15 ppm	0	Air	20.95 %	Air	N/A
	Span	2203 ppm	2200 ppm	SO2	2200.0 ppm	P20F000345	2021-02-21
O2	Zero	-0.08 %	0.00 %	N2	99.99 %	92520	2021-02-27
	Span	21.10 %	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:
 18 Aug 2020
Calibration Due Date:
 Nov 2020
Technician:
 J. Faber





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





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Tel: 0851 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:	
		3642	
CUSTOMER:	Eskom Medupi	JOB NO:	SC1757
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 %	Air	N/A
	Span	839 ppm	835 ppm	CO	836.4 ppm	P20F000332	2021-02-03
NO	Zero	-3 ppm	0 ppm	Air	20.95 %	Air	N/A
	Span	882 ppm	877 ppm	NO	876.7 ppm	P20F000346	2021-01-21
SO2	Zero	0 ppm	0	Air	20.95 %	Air	N/A
	Span	2249 ppm	2200 ppm	SO2	2200.0 ppm	P20F000345	2021-02-21
O2	Zero	-0.05 %	0.00 %	N2	99.99 %	92520	2021-02-27
	Span	20.97 %	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:
18 Aug 2020


Calibration Due Date:
Nov 2020

Technician:
J. Faber





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





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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:					
3645					
CUSTOMER:	Eskom Medupi			JOB NO:	SC1757
CONTACT NAME:	Lerato Sehume			TEL:	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	
CO	Zero	-5 ppm	0 ppm	Air	20.95 %	Air	N/A
	Span	831 ppm	835 ppm	CO	836.4 ppm	P20FO00332	2021-02-03
NO	Zero	-15 ppm	0 ppm	Air	20.95 %	Air	N/A
	Span	868 ppm	877 ppm	NO	876.7 ppm	P20FO00346	2021-01-21
SO2	Zero	-83 ppm	0	Air	20.95 %	Air	N/A
	Span	2389 ppm	2389 ppm	SO2	2200.0 ppm	P20FO00345	2021-02-21
O2	Zero	-0.35 %	0.00 %	N2	99.99 %	92520	2021-02-27
	Span	21.34 %	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:
17 Aug 2020


Calibration Due Date:
Nov 2020

Technician:
J. Faber





A REASONABLE ADVANTAGE




A Teledyne Technologies Company


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

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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		



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CALIBRATION CERTIFICATE


CERTIFICATE NO:					
3644					
CUSTOMER:	Eskom Medupi			JOB NO:	SC1757
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	-25 ppm	0 ppm	Air	20.95 %	N/A	
	Span	815 ppm	835 ppm	CO	836.4 ppm	P20F000332	2021-02-03
NO	Zero	-18 ppm	0 ppm	Air	20.95 %	N/A	
	Span	857 ppm	877 ppm	NO	876.7 ppm	P20F000346	2021-01-21
SO2	Zero	-34 ppm	0	Air	20.95 %	N/A	
	Span	2236 ppm	2200 ppm	SO2	2200.0 ppm	P20F000345	2021-02-21
O2	Zero	0.06 %	0.00 %	N2	99.99 %	92520	2021-02-27
	Span	21.13 %	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:
17 Aug 2020
Calibration Due Date:
Nov 2020
Technician:
J. Faber






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




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		Document Identifier	240-88543153	Rev	2
		Effective Date	January 2021		
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CALIBRATION CERTIFICATE

CERTIFICATE NO:					
3643					
CUSTOMER:	Eskom Medupi			JOB NO:	SC1757
CONTACT NAME:	Lerato Sehume			TEL:	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	
CO	Zero	0 ppm	0 ppm	Air	20.95 %	N/A	
	Span	833 ppm	835 ppm	CO	836.4 ppm	P20F000332	2021-02-03
NO	Zero	-2 ppm	0 ppm	Air	20.95 %	N/A	
	Span	878 ppm	877 ppm	NO	876.7 ppm	P20F000346	2021-01-21
SO2	Zero	-9 ppm	0	Air	20.95 %	N/A	
	Span	2257 ppm	2200 ppm	SO2	2200.0 ppm	P20F000345	2021-02-21
O2	Zero	0.12 %	0.00 %	N2	99.99 %	92520	2021-02-27
	Span	21.04 %	20.95 %	Air	20.95 %	N/A	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:
17 Aug 2020


Calibration Due Date:
Nov 2020

Technician:
J. Faber





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



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