	Medupi Power Station Monthly Emissions Report	Identifier	240-43921804	Rev	6
		Document Identifier	240-88543153	Rev	1
		Effective Date	January 2018		
		Review Date	January 2021		

Phumudzo Thivhafuni

Date: 2018/06/20

Limpopo Dept. of Economic Development, Environment and Tourism

Enquiries:

Private Bag 9484
POLOKWANE
0700

Ref: 12/4/12L-W2/A3 – May 2018

Dear Phumudzo

MEDUPI POWER STATION MONTHLY EMISSIONS REPORT FOR THE MONTH OF MAY 2018

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 4, 5 and 6 gaseous and particulate emissions performance against the AEL limit for the month of May 2018 only.

1. Raw Materials and Products

Table 1: Quantity of raw materials and products used/produced for Unit 4, 5 and 6 in May 2018

Raw Materials and Products used	Raw Material Type	Unit	Maximum Permitted Consumption/ Rate (Quantity)	Unit 4, 5 and 6 consumption May 2018
	Coal	Tons/month	1 875 000	619 390
	Fuel Oil	Tons/month	40 000	790.5
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Unit 4, 5 and 6 Production Rate in Month of May 2018
	Energy	MW	4800	2012.48
	Ash Emitted	Tons/month	not specified	147

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Table 2: Daily consumption and production rates

Date	Reportable hours of Operation			Fuel Consumption (tons)				Production rate (MW)		
	Unit 4	Unit 5	Unit 6	Oil			Coal	U4	U5	U6
				Aux Boiler	Unit 4, 5 & 6	Total	Unit 4, 5 & 6)			
01-May-18	24.0	24.0	24.0	0.00	17	17	17139	628	650	600
02-May-18	24.0	24.0	24.0	0.00	9	9	20815	640	729	657
03-May-18	24.0	24.0	24.0	0.00	35	35	20882	692	693	693
04-May-18	24.0	24.0	24.0	0.00	9	9	19659	622	659	609
05-May-18	24.0	24.0	24.0	0.00	14	14	19532	623	664	654
06-May-18	24.0	24.0	11.5	0.00	16	16	16924	642	671	609
07-May-18	24.0	24.0	1.5	0.00	57	57	20512	638	740	653
08-May-18	24.0	24.0	24.0	0.00	47	47	21075	664	707	700
09-May-18	24.0	24.0	24.0	0.00	8	8	20453	641	651	726
10-May-18	22.7	24.0	24.0	0.00	10	10	20236	600	746	700
11-May-18	0.0	24.0	24.0	0.00	25	25	14888	205	772	698
12-May-18	2.4	24.0	24.0	0.00	280	280	19920	563	692	669
13-May-18	24.0	24.0	24.0	0.00	51	51	19910	625	686	658
14-May-18	24.0	24.0	24.0	0.00	22	22	20615	665	691	693
15-May-18	24.0	24.0	24.0	0.00	17	17	22209	675	746	739
16-May-18	24.0	24.0	24.0	3.77	0	4	22854	689	777	725
17-May-18	24.0	24.0	24.0	0.00	0	0	21983	693	751	715
18-May-18	24.0	24.0	24.0	0.00	4	4	22034	716	759	727
19-May-18	24.0	24.0	24.0	0.00	4	4	20998	701	721	685
20-May-18	24.0	24.0	24.0	0.00	40	40	20317	703	774	715
21-May-18	24.0	24.0	24.0	0.00	42	42	19446	640	672	643
22-May-18	24.0	24.0	24.0	0.00	2	2	20211	661	719	664
23-May-18	24.0	24.0	24.0	0.00	20	20	21868	662	685	650
24-May-18	24.0	24.0	24.0	0.00	6	6	20037	654	698	668
25-May-18	24.0	24.0	24.0	0.00	1	1	20174	650	698	674
26-May-18	24.0	24.0	24.0	0.77	0	1	19770	636	680	636
27-May-18	24.0	24.0	24.0	0.00	2	2	19655	621	686	627
28-May-18	24.0	24.0	24.0	0.00	5	5	18497	644	689	626
29-May-18	24.0	24.0	24.0	0.00	35	35	18197	653	701	614
30-May-18	24.0	24.0	24.0	0.00	0	0	17641	662	685	605
31-May-18	23.9	23.9	23.9	0.00	8	8	20944	688	726	641

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2. Abatement Technology

Table 3: Abatement Equipment Control Technology utilisation for month of May 2018

Associated Unit/Stack	Technology Type	Actual Utilisation (%) for the month of May 2018
Unit 4,5 and 6	Low NO _x Burners	100
	Pulse Jet Fabric Filter Plant	100

3. Energy Source Characteristics

Table 4: Energy Source Material Characteristics for the month of May 2018

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	1.58
Ash Content	35 - 39	34.14

Table 5: Energy Source Material Characteristics for the month of May 2018

Characteristic	Stipulated Range (%)	Monthly Average Content (%)
Oil		
Sulphur Content	0.5 - 3.5	2.1
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 daily emission limits are as follows:

SO₂= 3500 mg/Nm³

Dust= 50 mg/Nm³

NO₂= 750 mg/Nm³

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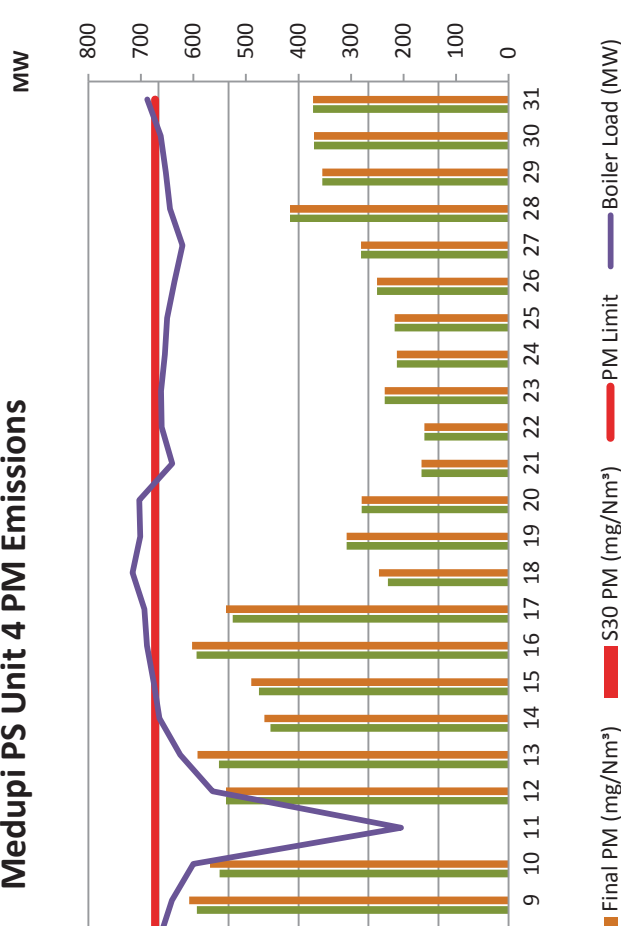
Readings for the month of May 2018

	SO ₂ (mg/Nm ³)			NO ₂ (mg/Nm ³)			CO (mg/Nm ³)			Temp (°C)			Press (kPa)			Velocity (m/s)		
	4	5	6	4	5	6	4	5	6	4	5	6	4	5	6	4	5	
1	3394.9	3251.4	2754.5	569.1	363.4	378.1	8.6	5.4	5.4	128.2	129.0	90.1	90.2	90.3		4	5	24.3
2	3226.9	3129.0	2762.8	586.5	377.8	395.1	10.4	5.3	5.7	130.2	134.0	90.1	90.0	90.1		4	5	25.4
3	3222.8	3158.8	2716.5	589.9	386.9	418.0	11.1	5.5	6.6	128.2	136.7	90.2	89.8	89.9		4	5	24.9
4	3174.9	3069.0	2772.8	631.2	386.5	388.2	8.8	5.4	4.8	129.3	134.7	90.3	89.9	89.9		4	5	24.5
5	3479.6	3433.3	3002.4	609.4	359.8	348.5	10.0	7.9	24.0	128.3	132.7	90.1	90.0	90.0		4	5	24.4
6	3365.6	3354.1	2983.0	588.1	375.4	361.8	9.1	5.3	27.0	130.4	127.3	89.9	90.0	90.1		4	5	24.6
7	3001.1	2919.9	2529.5	553.7	368.8	353.2	8.0	4.4	19.3	132.3	134.7	89.9	90.0	90.1		4	5	25.6
8	3332.3	3187.0	2773.3	615.8	380.1	383.5	8.8	5.9	19.3	131.8	136.0	90.1	89.9	90.0		4	5	25.1
9	3082.7	2984.4	2690.2	560.7	365.0	365.5	9.3	3.8	18.3	126.5	135.6	90.1	89.8	89.9		4	5	24.2
10	3200.5	3135.4	2793.8	619.9	388.5	372.6	10.3	5.0	36.0	131.7	133.2	90.1	89.9	89.9		4	5	25.9
11		2894.7	2616.1		381.8	361.2		4.8	29.5	133.3	132.6	90.0	89.8	89.9		4	5	26.3
12	1013.2	2763.7	2637.3	584.6	370.1	363.7	2.3	4.4	30.7	131.9	132.6	89.9	89.5	89.9		4	5	25.0
13	3123.1	2955.4	2460.7	541.4	359.4	352.4	29.1	6.0	18.3	130.7	133.0	90.0	89.5	89.6		4	5	24.8
14	3161.5	3079.1	2501.2	622.1	352.5	341.2	9.9	5.4	11.0	124.6	133.2	90.0	89.7	89.5		4	5	24.9
15	3450.2	3563.4	2563.0	660.9	377.1	336.9	9.4	3.1	40.5	128.6	129.5	89.6	89.9	89.7		4	5	25.9
16	3191.8	3370.2	3022.5	682.8	393.2	372.7	14.3	4.9	29.2	132.5	133.5	89.5	89.9	89.9		4	5	26.0
17	3104.1	3096.7	2796.1	566.6	371.2	379.0	9.2	5.1	41.5	130.5	135.2	89.7	90.0	90.0		4	5	25.9
18	3126.5	3188.4	2701.8	568.4	358.0	359.2	8.8	7.8	39.1	129.7	134.5	89.9	90.0	90.0		4	5	25.8
19	3266.1	3134.1	2758.1	539.2	388.1	348.3	4.7	3.7	43.0	128.6	135.1	90.0	90.1	90.1		4	5	25.3
20	3296.8	3192.8	2641.1	530.7	410.3	363.5	9.1	7.7	14.0	128.7	131.4	90.0	89.9	90.2		4	5	25.6
21	3241.6	3148.1	2864.8	509.3	380.2	360.8	10.0	3.0	6.4	127.5	128.6	90.1	89.9	90.0		4	5	24.5
22	3397.9	3259.2	2703.6	547.5	409.9	335.6	9.3	3.6	22.9	130.7	128.7	90.2	90.0	90.0		4	5	25.2
23	3359.5	3347.4	2846.2	635.1	477.3	349.0	5.0	4.6	27.2	135.4	131.0	90.0	90.1	90.0		4	5	24.8
24	3590.2	3427.2	2750.9	536.7	423.4	381.5	8.1	4.3	27.2	129.9	137.2	89.9	90.0	90.2		4	5	24.9
25	3325.9	3316.6	3028.1	561.2	410.1	348.9	9.8	4.3	21.5	129.9	132.3	90.1	89.9	90.0		4	5	25.0
26	3533.4	3504.4	2992.1	500.8	420.0	384.8	4.2	4.9	8.0	130.3	133.2	90.2	90.0	89.9		4	5	24.7
27	3051.8	3084.7	3130.8	536.5	413.1	394.3	8.5	4.3	4.8	129.3	131.5	90.1	90.2	90.0		4	5	24.7
28	3148.9	2932.7	2909.5	615.5	442.2	391.6	44.5	6.2	4.5	131.5	130.4	89.9	90.2	90.2		4	5	24.8
29	3260.9	3182.9	2544.8	577.9	452.2	422.8	14.5	6.3	3.6	131.0	133.3	90.0	89.9	90.3		4	5	25.0
30	3236.7	3174.2	2641.9	622.3	444.0	445.1	18.9	3.9	2.8	129.8	131.4	90.3	89.9	90.0		4	5	24.6
31	3266.4	3049.4	2799.5	676.8	466.1	444.9	31.6	5.5	4.6	131.9	129.5	90.3	89.8	89.9		4	5	25.4

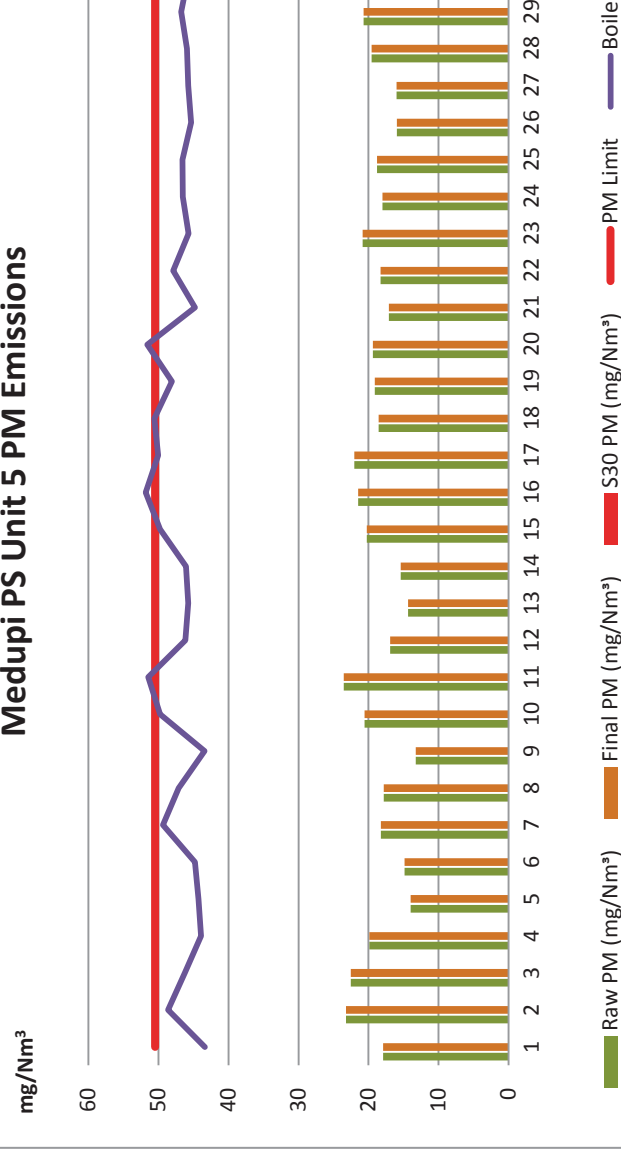
are faulty. A notification has been loaded for the maintenance team to fix the instrument. There is no reportable data on areas shaded black. The days wherein EL1 was declared is high

Emissions for the May 2018

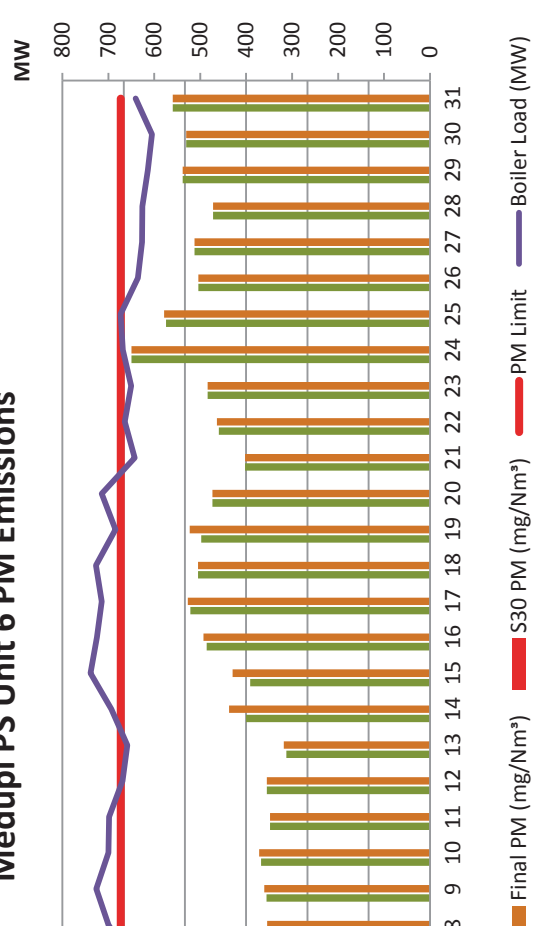
Medupi PS Unit 4 PM Emissions



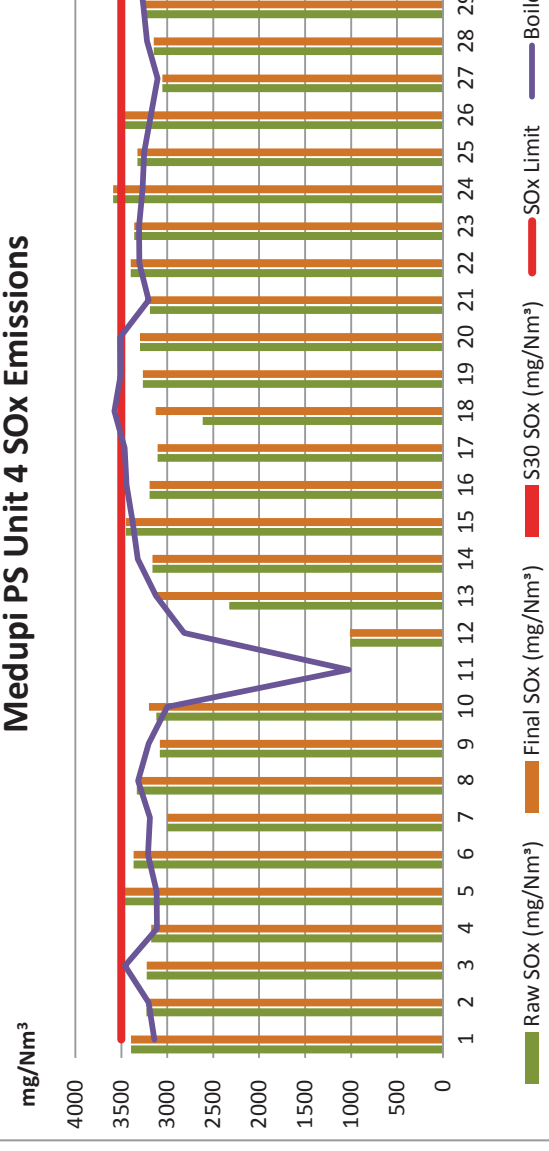
Medupi PS Unit 5 PM Emissions



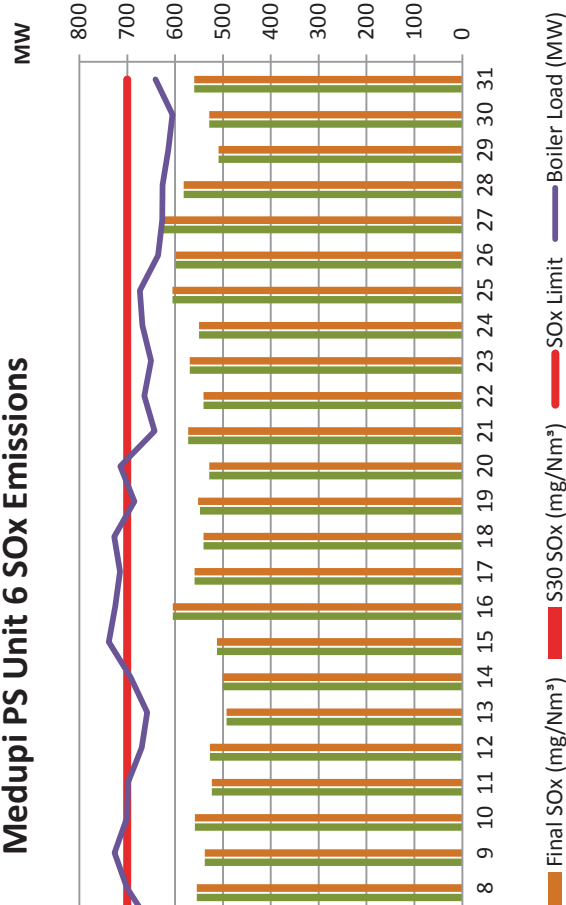
Medupi PS Unit 6 PM Emissions



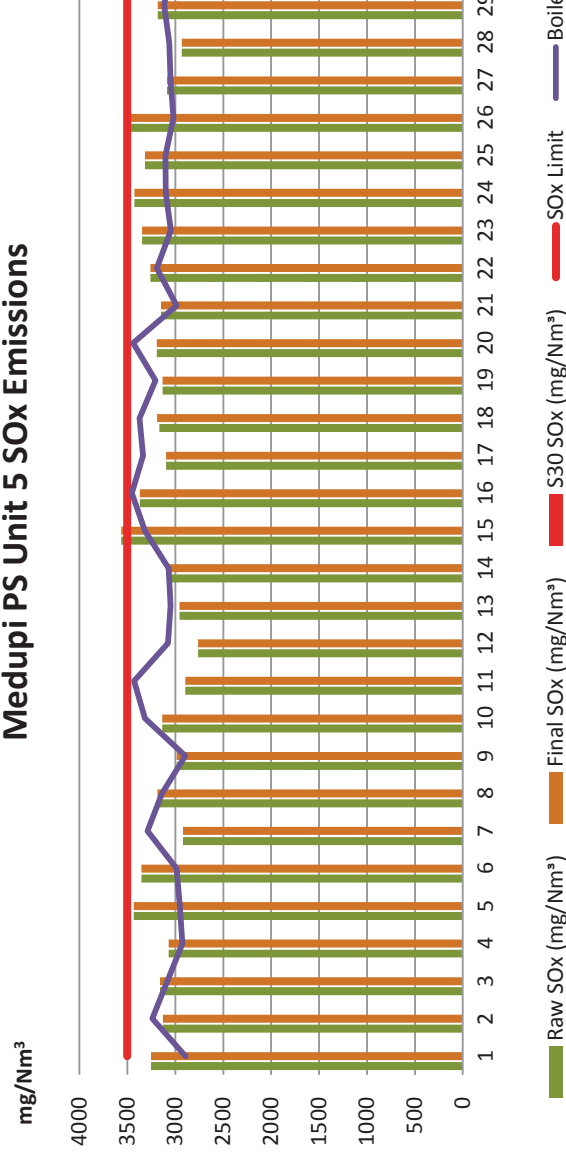
Medupi PS Unit 4 SOx Emissions



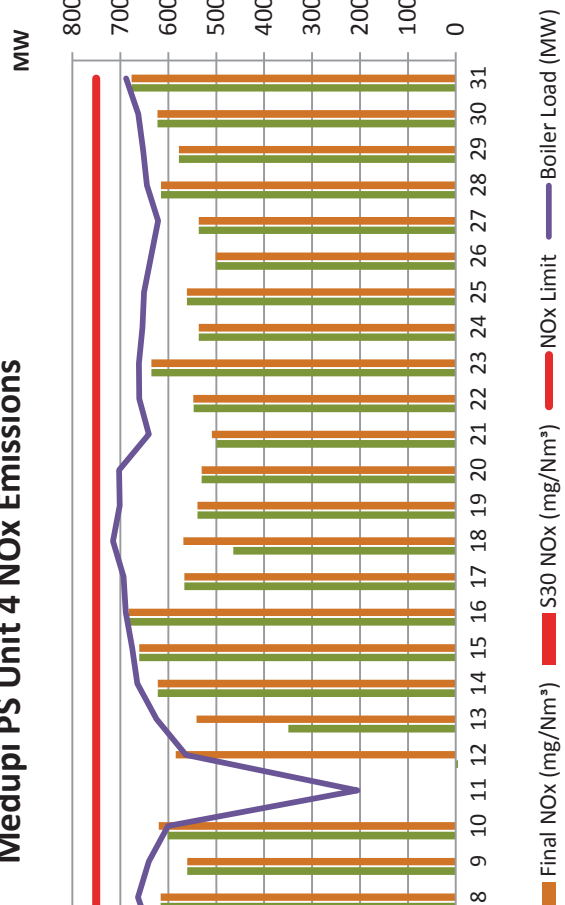
Medupi PS Unit 6 SOx Emissions



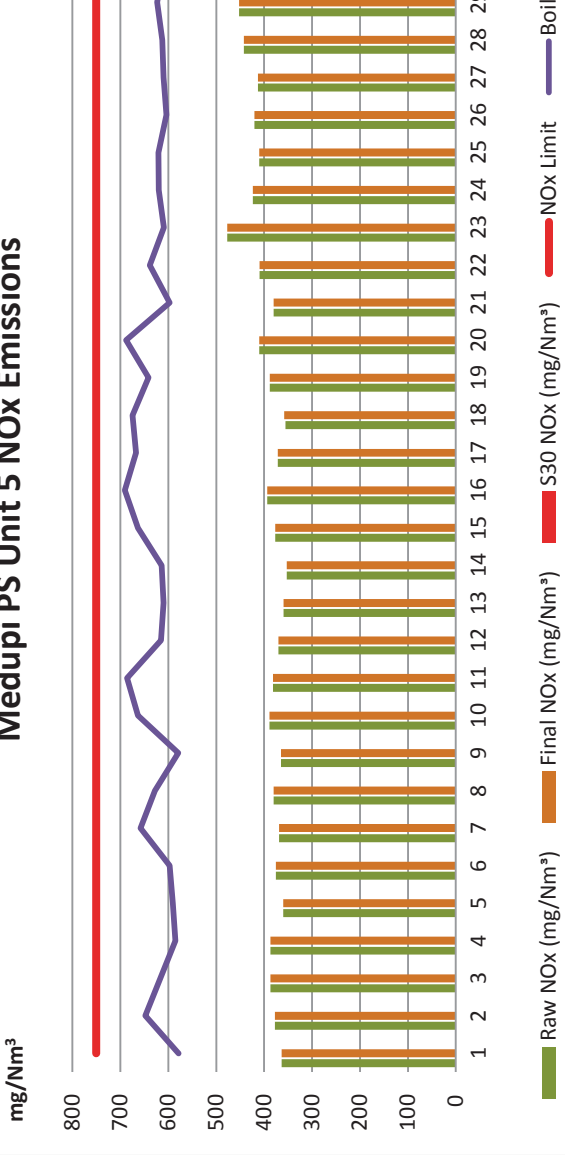
Medupi PS Unit 5 SOx Emissions



Medupi PS Unit 4 NOx Emissions



Medupi PS Unit 5 NOx Emissions





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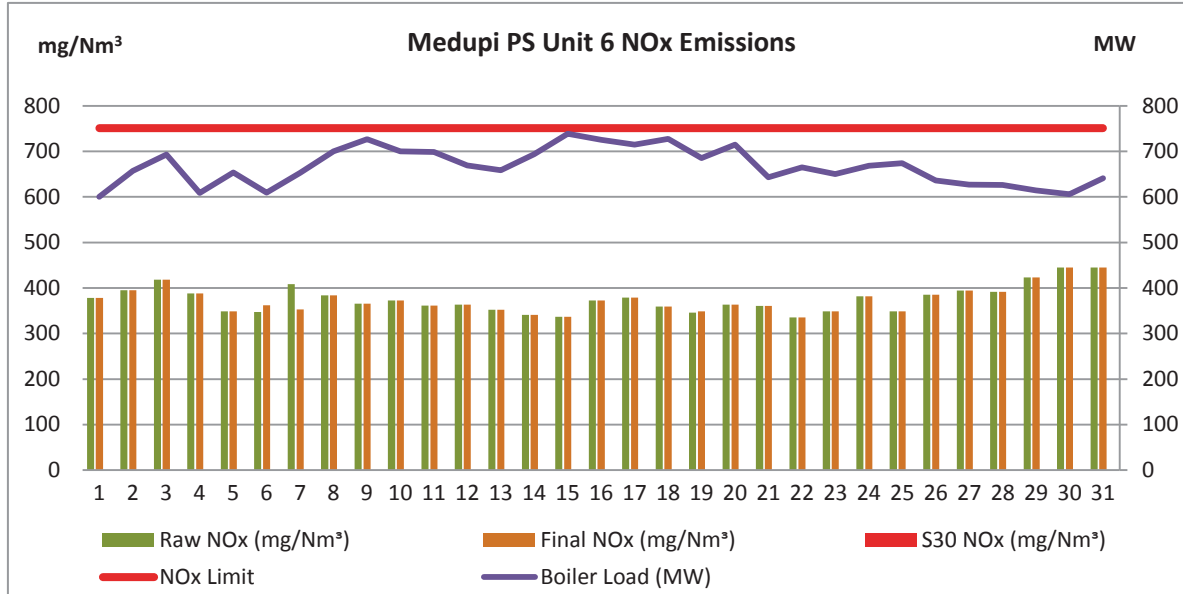


Table 7: Monthly tonnages for the month of May 2018


Unit	PM (tons)	SO ₂ (tons)	NO ₂ (tons)	CO (tons)	CO ₂ (tons)
1	0.0	0	0	0	
2	0.0	0	0	0	
3	0.0	0	0	0	
4	0.0	11 263	2 023	42	
5	46.7	7 841	978	13	
6	100.3	8 146	1 103	58	
SUM	147.0	27 250	4 103	113	

Note: Unit 4 tonnages are not calculated due to unavailability of flow and temperature meter

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5. Shutdown/start-up information

Table 8: Days operating under normal operation, days in grace period and section 30 days respectively

Unit	Operating Days (DD:HH:MM)			
	Normal operation	In grace period	Under S 30	Unit off load
1	00:00:00	00:00:00	00:00:00	31:00:00
2	00:00:00	00:00:00	00:00:00	31:00:00
3	00:00:00	00:00:00	00:00:00	31:00:00
4	30:01:00	00:00:00	00:00:00	00:23:00
5	30:23:55	00:00:00	00:00:00	00:00:05
6	30:12:55	00:00:00	00:00:00	00:11:05


6. Comments on the performance and availability of each unit

- Unit 4 was available throughout the reporting period except for the 11th wherein there was off-load Unit off load for PA ducting repair work, there was a single incident of particulates emissions limit exceedance and two SO₂ limit exceedances during this period.
- There was no trip recorded on unit 5 was throughout the reporting period. There were no incidences of particulates and NO_x emissions limit exceedance were recorded; two exceedances of SO₂ daily average emissions limit were also recorded on unit 5.
- Unit 6 performed well within the limit of the Atmospheric Emissions Licence throughout the reporting period.

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7. Light up information

Table 9: PM Start-up information for the month of May

Event No.	Event 1		Event 2	
Unit	Unit 4		Unit 6	
Fires in	11:50 AM	2018/05/11	03:05 PM	2018/05/06
Synchronisation with Grid	09:30 PM	2018/05/11	10:25 PM	2018/05/06
Emissions below limit from Sync (Date and Time)	did not go above limit	did not go above limit	did not go above limit	did not go above limit
Fires in to synchronization	00:09:40	Hrs (dd:hh:mm)	00:07:20	Hrs (dd:hh:mm)
Synchronization to < limit (Duration)	did not go above limit	Hrs (dd:hh:mm)	did not go above limit	Hrs (dd:hh:mm)

Table 10: Emission Average from Fires-in to Synchronisation

Emission Average (mg/Nm ³) from Fires-in to Synchronisation (Date and Time)							
Unit	Fires-In		Synchronisation		PM	SO ₂	NO _x
4	2018/05/11	11:50 AM	2018/05/11	09:30 PM	0.0	0.0	0.0
6	2018/05/06	03:05 PM	2018/05/06	10:25 PM	23.7	2673.9	327.1

Table 11: Point Source emissions released during Shut-down

Emission Average (mg/Nm ³) Breaker Open (BO) to Draft Group Shut Down (SD) (Date & Time)							
Unit	Breaker Open		DG SD		PM	SO ₂	NO _x
4	2018/05/10	10:40 PM	2018/05/10	11:30 PM	23.3	169.1	0.0
6	2018/05/06	11:30 AM	2018/05/06	11:25 AM	6.2	501.6	33.1


8. Continuous Emission Monitoring Systems (CEMS)

Unit 4, 5 and 6 Continuous Emission Monitoring Systems were in operation at all times when the unit was on load. CEMS CO₂ monitor verification test not yet conducted, the

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Licensing Authority will be notified prior to conducting the test. The Department will be notified of the exact date for the test.

Table 12: Periods during which CEMS was inoperative

Date	Time	Duration	Nature of Repair/Adjustment
N/A	N/A	N/A	N/A

Table 13: CEMS Monitor Reliability

Variable	Unit 4	Unit 5	Unit 6
Dust	99.9	100.0	99.7
SO ₂	98.3	100.0	99.8
NO _x	96.8	100.0	99.8
CO	100.0	100.0	100.0
O ₂	97.5	100.0	99.8
Temperature	0.0	100.0	100.0
Pressure	0.0	100.0	100.0
Velocity	8.6	100.0	99.8
CO ₂	0.0	0.0	0.0

9. CEMS Calibration certificates and equipment used for calibration

See attached Appendix A


10. Ambient Air Quality Monitoring Report

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

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11. 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 14: Total Volatile Organic Compound (TVOC) for May 2018

		
CALCULATION OF EMISSIONS OF TOTAL VOLATILE COMPOUNDS FROM FUEL OIL STORAGE TANKS*		
Date:	31 May 2018	
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 <i>blue cells</i> below</p> <p align="center">Choose from a dropdown menu in the <i>green cells</i></p> <p align="center">The total VOC emissions for the month are in the <i>red cells</i></p> <p align="center">IMPORTANT: Do not change <i>any</i> other cells without consulting the AQ CoE</p>		
MONTH:	May	
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:	2825.15643	tons/month
Molecular weight of the fuel oil:	166.00	Lb/lb-mole
METEROLOGICAL DATA FOR THE MONTH		
	Data	Unit
Daily average ambient temperature	19.51	°C
Daily maximum ambient temperature	28.42	°C
Daily minimum ambient temperature	12.06	°C
Daily ambient temperature range	15.04	°C
Daily total insolation factor	3.91	kWh/m ² /day
Tank paint colour	Aluminum/Specular	NA
Tank paint solar absorbance	0.39	NA
FINAL OUTPUT:		
	Result	Unit
Breathing losses:	0.70	kg/month
Working losses:	0.08	kg/month
TOTAL LOSSES (Total TVOC Emissions for the month):	0.78	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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12. Air quality improvements initiatives and public education and awareness campaigns

There were no activities planned for the month of May 2018.

13. Complaints Register


Table 15: Complaints for the month of May 2018

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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		Review Date	January 2021		

Compiled by: Senior Environmental Advisor

Reviewed by: Boiler System Engineer

Supported by: Environmental Manager ✓

Supported by: Boiler Engineering Manager

Supported by: Engineering Group Manager (Acting)

I Rudi van der Wal, declares that the information provided in this report is accurate and correct.


Yours sincerely

GENERAL MANAGER: MEDUPI POWER STATION

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APPENDIX 1

CEMS Calibration certificates



12 Angeller street, Berdena,
Boksburg, 1459
P.O.BOX 328, ISANDO, 1600
TEL: +27 11 918 6994
FAX: +27 11 894 1037

VAT REG #: 421 021 2249
CO REG #: 2004/007607/07

CALIBRATION CERTIFICATE

					CERTIFICATE NO:	
					2555	
					Doc. No: EA_5656	
Customer:		Medupi Power			Job No: SC943	
Contact Name:		Christo Vorster	Phone: 014 762 2255		Fax:	
Model:		Voedisch MGA 23	Serial No: 16339			
Auxiliary Equipment:		Unit 6				

CHAN		PRIOR	FINAL	TEST GAS	TEST GAS VALUE	GAS CERTIFICATE NUMBER
1	ZERO	7 ppm	0 ppm	Air	21 %	Air
	SPAN	881 ppm	879 ppm	CO	879.2 ppm	12635
2	ZERO	3 ppm	0 ppm	Air	21 %	Air
	SPAN	829 ppm	834 ppm	NO	833.9 ppm	3207
3	ZERO	5 ppm	0.0 ppm	Air	21 %	Air
	SPAN	2507 ppm	2428 ppm	CO2	2427.7 ppm	0034
4	ZERO	0.06 %	0.0 %	N2	99.99 %	12635
	SPAN	21.07 %	20.95 %	O2	20.95 %	Air

Report: Diagnostics OK, coolers running, but one parasitic pump on cooler 1 not working, calibration was done with zero and span gas, analyser respond to all test gas, all in place and in working order.

Date: 09 Apr 2018

Cal Due Date: Jul 2018

Service Engineer:



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FAX: +27 11 894 1037

VAT REG #: 421 021 2249
CO REG #: 2004/007607/07

CALIBRATION CERTIFICATE

					CERTIFICATE NO:	
					2553	
					Doc. No: EA_5656	
Customer:	Medupi Power			Job No:	SC943	
Contact Name:	Christo Vorster	Phone:	014 762 2255	Fax:		
Model:	Foedisch MGA 23		Serial No:	13668		
Auxiliary Equipment:	Unit 4					

CHAN		PRIOR	FINAL	TEST GAS	TEST GAS VALUE	GAS CERTIFICATE NUMBER
1	ZERO	0 ppm	0 ppm	Air	21 %	Air
	SPAN	874 ppm	879 ppm	CO	879.2 ppm	12636
2	ZERO	10 ppm	0 ppm	Air	21 %	Air
	SPAN	816 ppm	834 ppm	NO	833.9 ppm	3207
3	ZERO	0 ppm	0 ppm	Air	21 %	Air
	SPAN	2347 ppm	2428 ppm	SO2	2427.7 ppm	0034
4	ZERO	0.33 %	0.0 %	N2	99.99 %	12636
	SPAN	21.49 %	20.96 %	O2	20.96 %	Air

Report: Diagnostics OK, cooler parastatic pump not working, has to be replaced, calibration was done with zero and span gas, analyser respond to all test gas, all in working order.

Date: 09 Apr 2018

Cal Due Date: Jul 2018

Service Engineer:



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VAT REG #: 421 021 2249
CO REG #: 2004/007607/07

CALIBRATION CERTIFICATE

				CERTIFICATE NO:	
				2554	
				Doc. No: EA_5656	
Customer:	Medupi Power			Job No:	SC943
Contact Name:	Christo Vorster	Phone:	014 762 2255	Fax:	
Model:	Foedisch MGA 23		Serial No:	13670	
Auxiliary Equipment:	Unit 5				

CHAN		PRIOR	FINAL	TEST GAS	TEST GAS VALUE	GAS CERTIFICATE NUMBER
1	ZERO	1 ppm	0 ppm	Air	21 %	Air
	SPAN	882 ppm	879 ppm	CO	879.2 ppm	12635
2	ZERO	2 ppm	0 ppm	Air	21 %	Air
	SPAN	838 ppm	834 ppm	NO	833.9 ppm	3207
3	ZERO	4 ppm	0 ppm	Air	21 %	Air
	SPAN	2387 ppm	2428 ppm	SO2	2427.7 ppm	0034
4	ZERO	0.02 %	0.0 %	N2	99.99 %	12635
	SPAN	21.39 %	20.95 %	Air	20.95 %	Air

Report: All diagnostics ok. Calibration was done with zero and span gas, analyser responding to all test gas.

Date: 09 Apr 2018

Cal Due Date: Jul 2018


Service Engineer:



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