

Mr. Vusi Mahlangu
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 Nkangala District Municipality
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Date:
 31 May 2018

Enquiries:

Dear Mr. Mahlangu

MATLA POWER STATION'S ANNUAL EMISSIONS REPORT FOR FINANCIAL YEAR 2017/2018

This serves as the annual report required in terms of Section 7.6 in Matla Power Station's Atmospheric Emission License (Ref No: 17/4/AEL/MP312/11/14), as well as in terms of the reporting requirements listed in the Minimum Emission Standards. The emissions are for Eskom's Matla Power Station 2017/2018 financial year which is from 01 April 2017 to 31 March 2018. Verified emissions of particulates, as measured by installed CEMS and SO₂ and NO_x (as NO₂), as calculated, are also included.

Name, description and reference number of plant as specified in the AEL: (Ref No: 17/4/AEL/MP312/11/14),

Name of facility	Eskom Holdings SOC limited- Matla Power Station
Description of facility	Power Generation, Electricity generation, Matla Power station, Delmas Road, Kriel, Mpumalanga
Reference number of plant	2002\015527\06

Emission Trends

The emissions in the table below are that of the 2017/2018 financial year.

Table 1. General oversight of emissions at Matla Power Station 2017/2018

Power Station	Coal-fired emissions (tons/annum)	Fuel-oil emissions (tons/annum)	Total (tons/annum)
Eskom Matla Power Station	PM: 4 850 SO₂: 169 470 NO_x: 85 810	PM: N/A SO₂: 660 NO_x: N/A	PM: 4 850 SO₂: 170130 NO_x: 85 810

Table 2: Pollutant Emission Trends for 2017/2018

Month	PM (tons)	SO ₂ (tons)	NO ₂ (tons)	CO ₂ (tons)	N ₂ O (tons)
April 2017	385	16 040	8 620		26.4
May 2017	254	17 020	8 810		31.6
June 2017	232	11 740	6 050		25.2
July 2017	176	11 870	6 050		25.8
August 2017	347	14 130	7 510		28.1
September 2017	377	10 910	5 110		26.4
October 2017	502	13 340	6 670		27.7
November 2017	551	18 350	8 990		30.7
December 2017	503	16 310	8 440		34.0
January 2018	709	12 740	6 460		34.7
February 2018	410	10 950	6 150		30.1
March 2018	404	16 070	6 950		31.1
Total	4 850	169 470	85 810		352.0

Major trends were experienced during the months of, October to December 2017 and January 2018. These high emissions were caused by various plant failures predominantly from unit 4. In the month of October unit 5 applied for a Section 30 for the maintenance issues. During the month of January 2018, unit 2 and 3 experience problems with faulty precipitator fields as well as Sulphur plant trips. These malfunctions were reported in the respective month's monthly reports.

Gaseous trends indicate a high NO_x readings, these were from the South stack (unit 1-3) during the months of April 2017, June to August and October. Unit 4 was reading high during the month of May, whilst unit 5 experienced high readings in August, all reading high NO_x. Upon investigation it was found that the O₂ analysers were reading high due to air ingress from a crack into the analysers thus giving wrong readings. The faulty meters were eventually repaired during the month of September and October 2017.

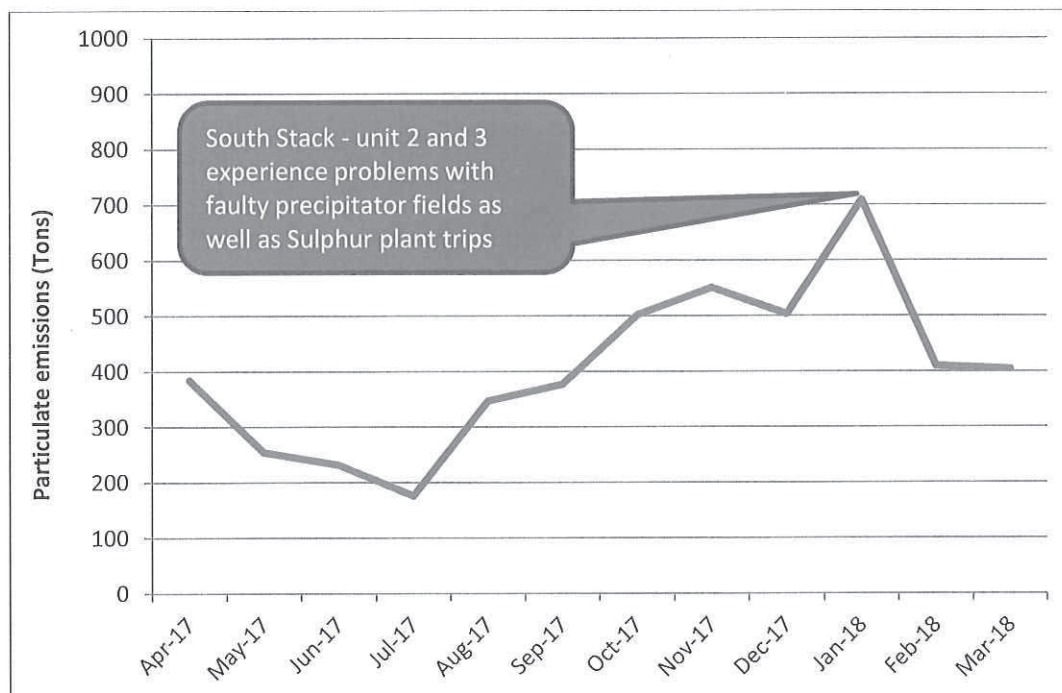


Figure 1: Monthly Particulate Emissions in tons from Matla Power Station 2017/2018

Please note: Gaseous emissions, in particular, are largely dependent on the power generated by the power station, and thus the amount of coal burnt.

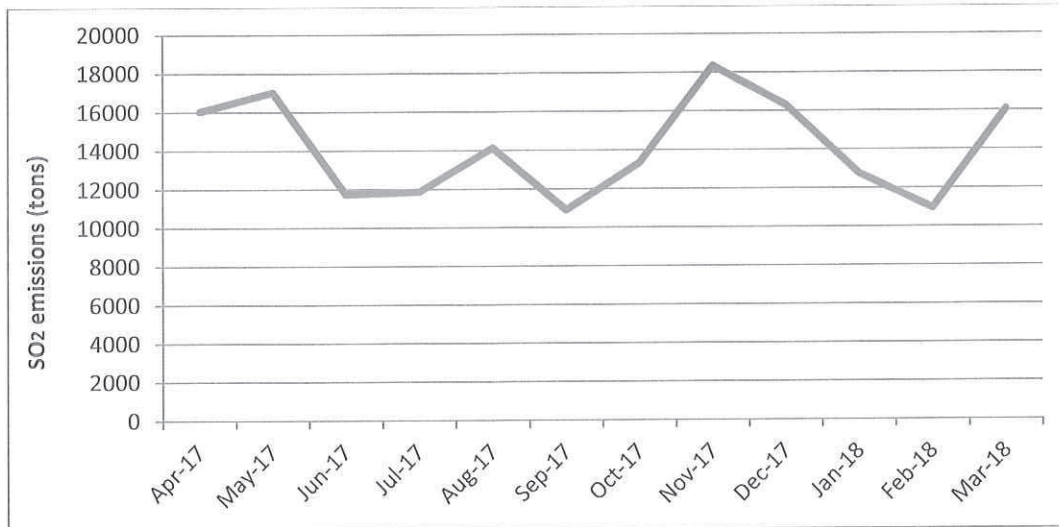


Figure 2: Monthly SO₂ Emissions in tons from Matla Power Station 2017/2018

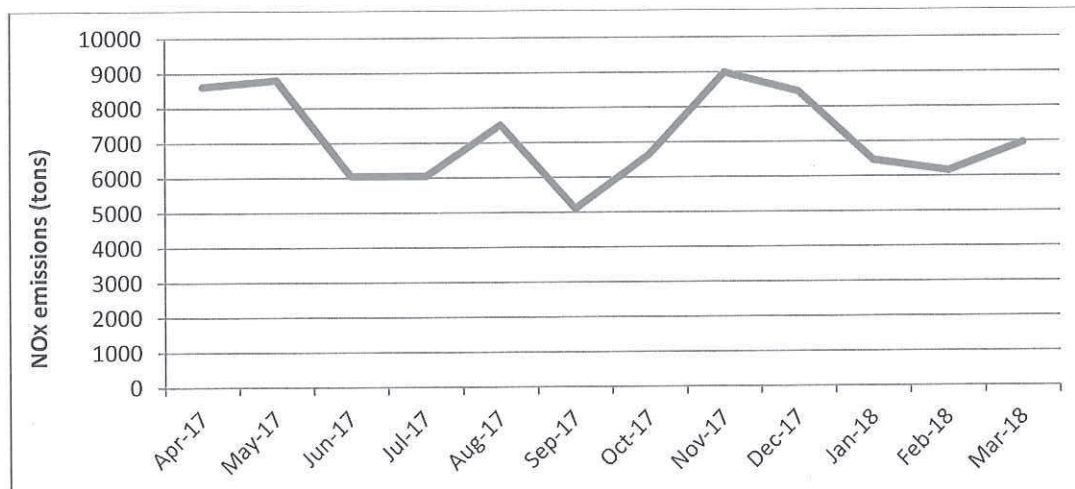


Figure 3: Monthly NO₂ Emissions in tons for Matla Power Station 2017/2018

Figure 4: Monthly CO₂ Emissions in tons from Matla Power Station 2017/2018

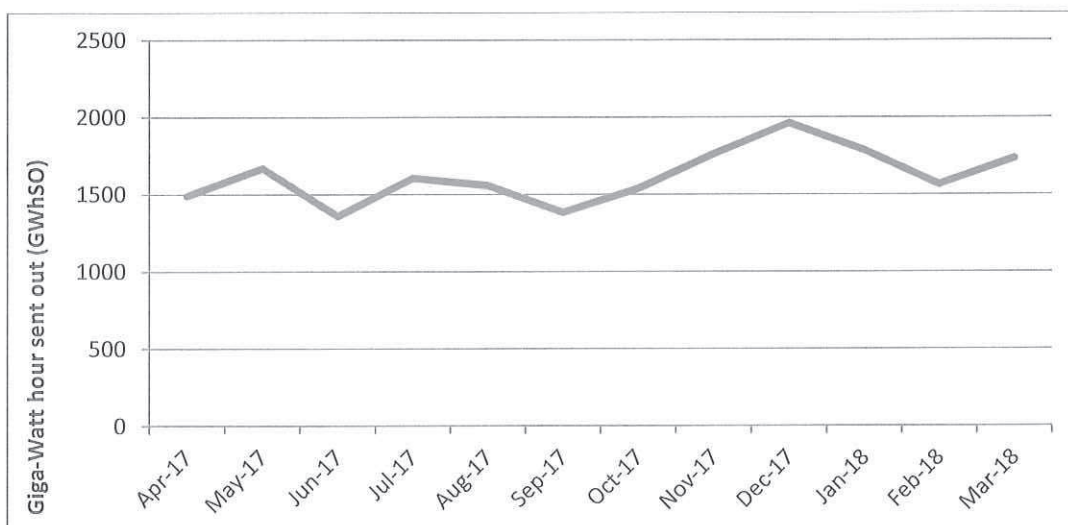


Figure 5: Monthly Energy sent out in GWh from Matla Power Station 2017/8

Figures showing compliance with the daily average emission limits of the respective pollutants have been presented to you in the monthly emission reports sent to your offices.

Monitoring data availability

Table 2. General oversight of monitoring data availability for Matla Power Station 2017/2018, in terms of the number of full hours per annum, that valid result obtained for the CEMS in question 2017/2018 fiscal year.

	South Stack (Units 1,2 and 3)	Unit 4	Unit 5	Unit 6
PM	100%	100%	100%	100%
SO ₂	84.4%	92.6%	99.1%	99.1%
NO _x	84.4%	92.3%	99.1%	99.1%

Compliance Audit Report(s):

There was one compliance audit conducted at Matla Power Station during the 2017\2018 financial year (March 2018). The external legal compliance review report is attached as appendix 1, although still in draft.

Major upgrades projects:

Boiler 2 electrostatic precipitator (ESP) upgrade has been completed during the refurbishment outage in May 2017. The expectation is that the particulate emissions on this unit will be below the future limit of 50mg/Nm³ following the optimization of the precipitators and SO₃ flue gas conditioning plant. This in effect will reduce the particulate emissions on the south stack.

The future retrofit of the ESP with fabric filter plants has been cancelled due to financial constraints. Matla has proven that boiler 5, the future limit of 50mg/Nm³ can be achieved by the upgraded ESP's. A project to upgrade boilers 1 and 4 ESP's was initiated with expected upgrades planned for December 2019 and 2021 respectively.

A project to enhance the existing flue gas cleaning plant has been introduced and is expected to commence with implementation during 2021 financial year. This project includes retrofitting the existing conventional rectifier/transformers with High Frequency Transformers (HFT's) which is expected to reduce the particulate emissions by approximately 20%.

A pilot project for installation of HFT's for boiler 5, currently using Electrostatic Precipitator abatement equipment, is planned for December 2018. This is aimed at testing the effectiveness of

this technology in order to reduce PM emissions. If the pilot project is found to be successful, it will be implemented to the remaining units.

Greenhouse gas emissions:

Greenhouse gas emissions as CO₂ and N₂O have been reported on in the above sections. These have been calculated.

Results of spot measurements or correlation tests:

Table 3. Overview of dates of last conducted CEMS verification tests for PM, SO₂ and NO_x (Please see annexure A for the verification test results)

Stack/ Unit	PM	SO ₂	NO _x
South Stack(Unit 1-3)	April 2018	November 2016	November 2016
Unit 4	March 2017	December 2016	December 2016
Unit 5	August 2017	December 2016	December 2016
Unit 6	November/December 2017	December 2016	December 2016

An explanation of all instances where minimum emission standards were exceeded:

South Stack Particulate exceedances			
Date	Daily Average Emission	Reason for Exceedance	Corrective Action
21/12/2017	268	SO ₃ common Sulphur supply pump failed	New pump installed

Unit 4 Particulate Exceedances			
Date	Daily Average Emission	Reason for Exceedance	Corrective Action
5/4/2017	242	SO ₃ shut down for gas leak repairs	Gas distribution flexible pipe replaced
10/4/2017	201	SO ₃ plant tripped when the de-superheater pressure control failed	Pressure control adjusted
5/8/2017	241	SO ₃ plant tripped when the de-superheater pressure control failed	Pressure control adjusted
8/8/2017	257	Precipitator fields tripped due to full hoppers caused by dust handling plant trips	Load reduced, dust plant orifices cleaned and hopper emptied.
16/8/2017	277	SO ₃ shut down for gas leak repairs	Gas distribution flexible pipe replaced
21/8/2017	350	SO ₃ plant tripped spuriously	
30/8/2017	243	SO ₃ tripped on converter temperature protection	Temperature restored and plant returned to service
4-5/9/2017	449	SO ₃ common plant power supply lost	Power supply cable replaced
8-9/9/2017	433	Unit shut down, SO ₃ plant tripped, precipitator field failure	Unit shut down for repairs
23-27/10/2017	609	Sulphur flow to the to SO ₃ plant failed. The root cause was high temperature spot resulting in sulphur flow starvation. Section 30 submitted)	The de-superheater design reviewed and modified to cater for a deterioration in efficiency.
1/11/2017	258	Sulphur flow to SO ₃ plant failed	The de-superheater design reviewed and modified to cater for a deterioration in efficiency.
16-	497	SO ₃ shut down for gas leak repairs	Gas distribution flexible pipe

17/11/2017			replaced
21/12/2017	268	SO ₃ common Sulphur supply pump failed	New pump installed
18-19/1/2018	512	SO ₃ plant shut down for planned maintenance	Steam traps replaced
25/1/2018	224	SO ₃ shut down for gas leak repairs	Gas distribution flexible pipe replaced
31/1/2018-1/2/2018	358	SO ₃ plant shut down for planned maintenance	Steam traps replaced
9/2/2018	204	SO ₃ tripped when the common sulphur line pressure indication failed	Sulphur line pressure sensor cable replaced
20/2/2018	309	Start up	
2/3/2018	254	Left hand precipitators shut down for maintenance	Field #3 380v isolator replaced
28/3/2018	358	Start up	
29/3/2018	652	Trip and Start up	
30/3/2018	456	Shut down	

Unit 5 Particulate Exceedances

Date	Daily Average Emission	Reason for Exceedance	Corrective Action
29/9/2017	112	False reading	Monitor port found fouled and cleaned
12/10/2017	105	SO ₃ plant Sulphur flow failed	De-superheater adjusted
24-30/10/2017	378	Sulphur flow to the to SO ₃ plant failed. The root cause was high temperature spot resulting in sulphur flow starvation. Section 30 submitted)	The de-superheater design reviewed and modified to cater for a deterioration in efficiency.
2/11/2017	199	Right hand precipitator fields shut down for repairs	Power supply cable replaced
16-17/11/2017	203	SO ₃ plant shut down for planned maintenance	Steam traps replaced
21/12/2017	103	SO ₃ common Sulphur supply pump failed	New pump installed
18-19/1/2018	151	SO ₃ plant shut down for planned maintenance	Steam traps replaced
1/2/2018	155	SO ₃ plant shut down for planned maintenance	Steam traps replaced
22/3/2018	186	LH precipitator fields shut down for planned maintenance	Rapping gear electrical buckets replaced
28/3/2018	145	SO ₃ plant shut down for planned maintenance	Steam traps replaced

Unit 6 Particulate Exceedances

Date	Daily Average Emission	Reason for Exceedance	Corrective Action
11/4/2017	192	SO ₃ shut down for gas leak repairs	Gas distribution flexible pipe replaced
25-26/4/2017	123	SO ₃ plant failed and warm up slow	Plant placed in service after maintenance attended to heater controls
28/11/2017	141	Start up	
21/12/2017	137	SO ₃ common Sulphur supply	New pump installed

		pump failed	
18-19/1/2018	159	SO ₃ plant shut down for planned maintenance	Steam traps replaced
31/1/2018-1/2/2018	252	SO ₃ plant shut down for planned maintenance	Steam traps replaced
18-20/2/2018	259	SO ₃ plant sulphur flow failed	Burner Sulphur injection lance found blocked. Unblocked and placed in service
19-20/3/2018	116	Shut down	
28-29/3/2018	195	SO ₃ plant shut down for planned maintenance	Steam traps replaced

NAEIS reporting:

Matla Power Station submitted its annual report on the NAEIS system by the 31 March 2018.

The rest of the information demonstrating compliance with the emission licence conditions is supplied in the monthly emission reports sent to your office.

Hoping the above will meet your satisfaction.

Yours sincerely

ACTING GENERAL MANAGER: MATLA