

ANNEXURE 6

Table 1: Summary of current annual pollutant emission rates, estimated annual average stack concentrations and Eskom's requested emission limits

1	2	3	4	5	6	7	8	9	10	11	12	
Plant	Capacity factor(%), GWhSO per GWh @100%R C	'Current' SO2 emission rate t/yr	'Current' NOx emission rate t/yr	'Current' PM10 emission rate t/yr	SO2 concentration [mg/Nm3]	Calculated volumetric flow rate [Nm3/h]	SO2 annual average concentration [mg/Nm3]	Requested SO2 ELs ^g , daily average [mg/Nm3]	NOx annual average concentration [mg/Nm3]	Requested NOx ELs ^h , daily average [mg/Nm3]	PM10 annual average concentration [mg/Nm3]	Requested PM10 ELs, daily average [mg/Nm3]
Arnot	69%	77 274	51 384	2 990	1 187	8 840 000	998	2500	664	1200	39	50
Camden	63%	86 719	43 909	827	1 546	6 530 000	1516	4000	768	1700	14	75
Duvha U1-6	58%	137 236	79 276	9 096	1 187	12 000 000	1306	2600	754	1100	87	200/100/50 ^a
	55%	47 858	24 752	8 168			1346					350/100/75 ^b
Grootvlei					1 263	4 060 000		3800	696	1200	230	5 ^b
Hendrina	57%	113 742	48 178	2 546	1 780	7 060 000	1839	3800	779	1300	41	50
Kendal **	76%	218 038	91 544	10 288	1 886	17 800 000	1398	2800	587	1100/750	66	100
Komati	49%	24 606	23 744	???	1 263	2 940 000	955	3200	922	1400	???	100
Kriel	66%	136 413	101 628	16 638	984	11 530 000	1351	2800	1006	1600	165	350 ^c
Lethabo	73%	196 210	108 052	13 450	1 146	21 810 000	1027	3100	566	1100	70	150/100 ^d
Majuba	72%	178 574	138 633	2 490	1 146	18 150 000	1123	3200	872	1500	16	??
Matimba	80%	309 262	67 592	4 904	1 753	16 950 000	2083	3700	455	750	33	100
Matla	73.2%	194 302	116 814	13 546	1223	15 470 000	1434	2900	862	1400/750	100	200/50 ^e
Tutuka	63.5%	178 432	104 664	15 964	1161	14 810 000	1375	3400	807	1200	123	350 ^f

- a. Duhva, PM10: "Present to 1 April 2015: Unit 1-3: 100 mg/Nm3 ; Unit 4-6: 200 mg/Nm3 **1 April 20154 to 1 April 2024:** Unit 1-3: 50 mg/Nm3 ; Unit 4-6: 200 mg/Nm3"
- b. Grootvlei, PM10: "Now to 31 March 2018: 350 1 April 2018-1 April 2020: 100 1 April 2020 onwards: 75"
- c. Kriel, PM10: "From now until 31 March 2025: 350 From 1 April 2025: 50"
- d. Lethabo, PM10: "From now to 1 April 2015: Units 1-6: 150 From 1 April 2015 on: Units 1-6: 100"
- e. Matla , PM10: "From now until 31 March 2025: 200 From 1 April 2025: 50"
- f. Tutuka, PM10: "Now until 31 March 2024: 350 From 1 April 2024 on: 50"

- g. SO₂ emission limits are requested “from now until decommissioning”. Eskom’s ‘Planned abatement retrofits’ (Figure 1 in their Applications) includes their plan to retrofit FGD on Medupi only. That is, Eskom is effectively applying for exemption from the MES of 500mg/Nm³, applicable to existing plants from 01April2020 onwards.
- h. The NO_x emission limits applied for are in accordance with Eskom’s program for retrofitting “Low NO_x” burners on Matla, Tutuka and Majuba (2021 to 2025) plants only.

Note that the ‘Existing Plant’ MESs (01April2015 onwards) are: SO₂: 3500mg/Nm³; NO_x: 1100mg/Nm³; PM₁₀: 100mg/Nm³ (all daily average values).

The ‘New Plant’ MES (01April2020 onwards) are: SO₂: 500mg/Nm³; NO_x: 750mg/Nm³; PM₁₀: 50mg/Nm³ (all daily average values).

1. For each plant, the Eskom documentation gives the “current” pollutant emission rates (of SO₂, NO_x and PM₁₀) as tons of pollutant per year in three different places. The AIRs give the “current” annual total emission rates in Figure 3 and the per stack annual emission rates in Table 20 (sometimes Table 19 or 21). The GI documents for each plant give emission rates for the five most recent financial years, including 2012/2013. The three values differ from each other. In some cases the differences are substantial. The figures in columns 2, 3 and 4 are the higher of the AIR Figure 3 and Table 20 values. This gives a nearly complete set of “current” annual emission rate values. (The PM10 emission rate for Komati is not given in any of the documents.)
2. The MES are defined in terms of the daily average of the stack pollutant concentrations. In order to compare Eskom’s current emissions performance with the MES, and to critically evaluate their applications for postponement/ exemption, data on their current daily average concentrations is required. In the October 2013 AIRs, Eskom included annual average concentrations for each plant, but these figures have not been included in the current set of documents. Hence the need to estimate these values.
3. The current annual average concentrations may be calculated from the stack volumetric flow rates and the annual emission rates. Eskom gives the stack volumetric flow rates in the AIRs. It also gives stack diameters and gas exit velocities – these two values can also be used to calculate the stack volumetric flow rates. When these two values (calculated and the given values) are compared, they differ substantially for the majority of plants. Since the flow rates are not only required to enable a calculation of the current stack concentrations, but are needed to estimate future emissions and various health impact scenarios, the inconsistencies in the data are problematic. In order to estimate stack flow rates on a consistent basis, our technical expert did a combustion calculation for each plant, based on Eskom’s annual coal usage data. These flow rates (based on 10% O₂ in the stack gas) are given in column 4 of the table. The “current” annual average stack concentrations (columns 5, 7 and 9) are based on the flow rates and the emissions values in cols 1, 2 and 3.
4. For the SO₂ MES: on the surface, Eskom is applying for postponement of the application of the 2015 MES for Camden, Grootvlei, Hendrina and Matimba only (column 6 above, brown figures), and is simultaneously asking for emission limits a bit higher than 3500, that is 3700 to 4000mg/Nm³. Note that the annual average (not hourly average) “current” values are well below 3 500mg/Nm³. Even if it is assumed that the highest daily average value is likely to be up to twice the annual average value, only Hendrina and Matimba may occasionally exceed the 2015 MES. But the more important point is that Eskom has declared that it will not retrofit FGD on any of its existing plants. It is effectively applying for exemption from the 2020 MES of 500mg/Nm³ for all existing 13 power stations.