# ANNEXURE A

# ESKOM

## GENERAL INFORMATION FOR KRIEL POWER STATION

**DATE: December 2013**

| | POWER STATION - Kriel | | | | | |
|---|---|---|---|---|---|---|
| LOCATION | Nkangala District Municipality, Mpumalanga Province | | | | | |
| Total installed capacity (in MW) | **Unit 1** | **Unit 2** | **Unit 3** | **Unit 4** | **Unit 5** | **Unit 6** |
| | 500 | 500 | 500 | 500 | 500 | 500 |
| Cooling Plant Configuration | Wet | | | | | |
| Ashing Plant | Wet | | | | | |
| Existing air pollution control technology | See "Emissions Control Technology_2013.08.29". Electrostatic Precipitator (Units 1,2,3 - Three Field, Units 4,5,6, - Four Field), and Flue Gas Conditioning Plant | | | | | |
| Coal source | ANGLO: KRIEL OC, ANGLO: KRIEL UG, Shanduka MTC 23.5 cv, Shanduka Graspan 23.5 cv, Umcebo Kleinfontein, Umcebo Strathrae, Liketh-KK Pit 5, Umcebo Middlekraal | | | | | |
| Ash content | 24 to >27% | | | | | |
| Sulphur content | 0.6 to >0.8% | | | | | |
| Calorific value/energy content of the coal | designed CV = 19.50 MJ/kg | | | | | |
| Water use (2012/13) (l/KWh sent out) | 2.447 l/USO | | | | | |
| APPA registration certifications | See Attached Certificate | | | | | |
| The pending AEL application | See Attached Certificate | | | | | |

**Five year emissions**

| Variable | Year | | KRIEL |
|---|---|---|---|
| **$CO_2$ emissions (tons)** | **Annual** | **2008-2009** | 19 236 958 |
| | | **2009-2010** | 17 607 401 |
| | | **2010-2011** | 18 919 945 |
| | | **2011-2012** | 16 473 746 |
| | | **2012-2013** | 17 462 327 |
| **$CO_2$ emissions (kg per GWh sent out)** | **Annual** | **2008-2009** | 1 059 497 |
| | | **2009-2010** | 1 106 909 |
| | | **2010-2011** | 1 039 277 |
| | | **2011-2012** | 1 077 478 |
| | | **2012-2013** | 1 053 808 |
| **$SO_2$ emissions (tons)** | **Annual** | **2008-2009** | 111 931 |
| | | **2009-2010** | 101 900 |
| | | **2010-2011** | 113 010 |
| | | **2011-2012** | 101 233 |
| | | **2012-2013** | 136 413 |
| **$SO_2$ emissions** | **Annual** | **2008-2009** | 6 165 |

| Variable | Year | | KRIEL |
|---|---|---|---|
| **(kg per GWh sent out)** | | **2009-2010** | 6 406 |
| | | **2010-2011** | 6 208 |
| | | **2011-2012** | 6 621 |
| | | **2012-2013** | 8 232 |
| **$NO_2$ emissions (tons)** | **Annual** | **2008-2009** | 104 150 |
| | | **2009-2010** | 96 234 |
| | | **2010-2011** | 107 803 |
| | | **2011-2012** | 94 602 |
| | | **2012-2013** | 101 628 |
| **$NO_2$ emissions (kg per GWh sent out)** | **Annual** | **2008-2009** | 5 736 |
| | | **2009-2010** | 6 050 |
| | | **2010-2011** | 5 922 |
| | | **2011-2012** | 6 188 |
| | | **2012-2013** | 6 133 |
| **$N_2O$ emissions (tons)** | **Annual** | **2008-2009** | |
| | | **2009-2010** | |
| | | **2010-2011** | |
| | | **2011-2012** | 264 |
| | | **2012-2013** | 287 |
| **Particulate emissions (tons)** | **Annual** | **2008-2009** | 8482 |
| | | **2009-2010** | 28844 |
| | | **2010-2011** | 14493 |
| | | **2011-2012** | 11179 |
| | | **2012-2013** | 16638 |
| **Particulate emissions (tons per GWh sent out)** | **Annual** | **2008-2009** | 0,47 |
| | | **2009-2010** | 1,81 |
| | | **2010-2011** | 0,80 |
| | | **2011-2012** | 0,73 |
| | | **2012-2013** | 1,00 |
| **GWh sent out** | **Annual** | **2008-2009** | 18 157 |
| | | **2009-2010** | 15 907 |
| | | **2010-2011** | 18 205 |
| | | **2011-2012** | 15 289 |
| | | **2012-2013** | 16 571 |
| **Coal burn (wet tons)** | **Annual** | **2008-2009** | 9 420 764 |
| | | **2009-2010** | 8 504 715 |
| | | **2010-2011** | 9 527 185 |
| | | **2011-2012** | 8 360 504 |
| | | **2012-2013** | 8 902 897 |
| **Ash disposed (tons)** | **Annual** | **2008-2009** | |
| | | **2009-2010** | |
| | | **2010-2011** | 2 406 495 |
| | | **2011-2012** | 2 302 920 |
| | | **2012-2013** | 2 458 355 |

## Summary of Eskom's emission control technology

| | ARNOT 1-3 | ARNOT 4-6 | CAMDEN 5 & 6 | CAMDEN 1,2,3,4,7 & 8 | DUVHA 1-3 | DUVHA 4-6 | GROOTVLEI 1, 5 & 6. | GROOTVLEI 2, 3 & 4 |
|---|---|---|---|---|---|---|---|---|
| UNIT SIZE (MW) | 350/400 | 350/400 | 200 | 200 | 600 | 600 | 200 | 200 |
| TECHNOLOGY | RETRO PJFF | RETRO PJFF | RETRO PJFF | RETRO PJFF | RETRO PJFF | 5 FIELD ESP'S + $SO_3$ | RETRO PJFF | 5 FIELD ESP'S + $SO_3$ |
| Tot MW (ESPs) | | | | | | 1 800 | | 600 |
| Tot MW (FFPs) | 1 050 | 1 050 | 400 | 1 200 | 1 800 | | 600 | |
| SUPPLIER | ALSTOM | WALTHER | BATEMAN HOWDEN | BATEMAN HOWDEN | ABB/FLAKT | LURGI | ALSTOM | LODGE COTTRELL (ALSTOM) |
| DUE FOR UPGRADE | COMPLETED 2005 | COMPLETED 2001 | COMPLETED 2009 | 2005 - 2008 | <50 | | FROM 2006 | |
| UPGRADE TECHNOLOGY | | | PJFF | | COMPLETED 1996 | ESP UPGRADE/PJFF | | ESP UPGRADE/PJFF |
| ASH PLANT | HYDROVAC | HYDROVAC | | | | AIRSLIDES | | |

| | HENDRINA 1 - 5 | HENDRINA 6-10 | KENDAL 1-6 | KOMATI 1 - 5 | KOMATI 6 - 9 | KRIEL 1-3 | KRIEL 4-6 | LETHABO 1-6 |
|---|---|---|---|---|---|---|---|---|
| UNIT SIZE (MW) | 200 | 200 | 686 | 100 | 125 | 500 | 500 | 618 |
| TECHNOLOGY | RETRO PJFF | RETRO PJFF | 7 FIELD ESP'S+$SO_3$ | 4 FIELD RETRO ESP+$SO_3$ | 4 FIELD RETRO ESP+$SO_3$ | 3 FIELD ESP'S+$SO_3$ | 4 FIELD ESP'S+$SO_3$ | 7 FIELD ESP'S + $SO_3$ |
| Tot MW (ESPs) | | | 4 116 | 500 | 500 | 1 500 | 1 500 | 3 708 |
| Tot MW (FFPs) | 1 000 | 1 000 | | | | | | |
| SUPPLIER | BATEMAN HOWDEN | LURGI HOWDEN | WALTHER | KRUPP / WALTHER (ALSTOM) | | BRANDT | BRANDT | BRANDT |
| DUE FOR UPGRADE | COMPLETED 2003 | COMPLETED 1996 | | FROM 2006 | | FROM 2004 | | |
| UPGRADE TECHNOLOGY | | | | | | ESP RDE REWIRE (in progress) | ESP RDE REWIRE | ESP UPGRADE |
| ASH PLANT | HYDROVAC | HYDROVAC | CHAIN | | | PNUMATIC | PNUMATIC | CHAIN |

| | MAJUBA 1-6 | MATIMBA 1-6 | MATLA 1-3 | MATLA 4-6 | TUTUKA 1-6 | MEDUPI 1-6 | KUSILE 1-6 |
|---|---|---|---|---|---|---|---|
| UNIT SIZE (MW) | 685 | 660 | 600 | 600 | 609 | 798 | 799 |
| TECHNOLOGY | PJFF | 8 FIELD ESP'S + $SO_3$ | 4 FIELD ESP'S+$SO_3$ | 5 FIELD ESP'S+$SO_3$ | 5 FIELD ESP'S | PJFF + LNB + OFA | PJFF + LNB + OFA + FGD |
| Tot MW (ESPs) | | 3 960 | 1 800 | 1 800 | 3 654 | | |
| Tot MW (FFPs) | 4 110 | | | | | 4 788 | 4 792 |
| SUPPLIER | LURGI HOWDEN | STURTEVANT | LURGI | LURGI | LURGI | SPX BULCKE DURR | SPX BULCKE DURR |
| DUE FOR UPGRADE | | | FROM 2009 | | FROM 2017 | | |
| UPGRADE TECHNOLOGY | | SO3 FGC in 2008 | ESP REBUILD (HAMON) | ESP REBUILD (HAMON) | ESP UPGRADE/PJFF | FGD | |
| ASH PLANT | AIRSLIDES | CHAIN | PNUEMATIC | AIRSLIDES | CHAIN | PNEUMATIC | PNEUMATIC |