



water affairs

Department:
Water Affairs
REPUBLIC OF SOUTH AFRICA

Private Bag X313, Pretoria, 0001 Sedibeng Building, 185 Schoeman Street, Pretoria, Tel 012 336-7500
Fax: 012 323-4472/ 012 326-2715

LICENCE IN TERMS OF CHAPTER 4 OF THE NATIONAL WATER ACT, 1998(ACT NO. 36 OF 1998)

I, **Deborah Gabaakelwe Mochothi**, in my capacity as Project Manager. Letsema in the Department of Water Affairs under authority of the powers delegated to me by the Minister of Water and Environmental Affairs and, hereby authorise the following water use in respect of this licence.

SIGNED: 

DATE: 2011-04-01

LICENCE NO: 04/B20F/BCFGIJ/41
FILE NO: 16/2/7/B100/B174

1. **Water User:** Eskom Holdings: Kusile Power Station,
Postal Address of applicant: P.O. Box 1091
Johannesburg
2000
2. **Water Use**
 - 2.1 Section 21(g) of the Act: Disposing of waste in a manner which may detrimentally impact on a water resource, subject to the conditions as set out in Appendices I and II.
3. **Properties on which the use will be exercised**
 - 3.1 Section 21 (g) Hartebeestfontein 537 JR Portion 0
 - 3.2 Section 21 (g) Hartebeestfontein 537 JR Portion 1
4. **Registered owner of the Properties**
 - 4.1 Kusile Power Station-Eskom Holding Limited
5. **Licence and Review Period**
 - 5.1 This licence is valid for a period of twenty (20) years from the date of issuance and will be reviewed every five (5) years.

6. Definitions

"Any terms, words and expressions as defined in the National Water Act, 1998 (Act 36 of 1998) shall bear the same meaning when used in this licence."

"The Regional Head" means the Regional Chief Director: Mpumalanga, Department of Water Affairs, Private Bag x 11259, Nelspruit, 1200.

7. Description of Activity

This licence authorises the disposal of waste or water containing waste in a manner that may detrimentally impact on a water resources in terms of Section 21 (g): Irrigation with waste water on ash/gypsum dump to suppress dust (246 010 m³/a).

APPENDIX I

General conditions for the licence

1. This licence is subject to all applicable provisions of the National Water Act, 1998 (Act 36 of 1998).
2. The responsibility for complying with the provisions of the licence is vested in the licensee and not any other person or body.
3. The licensee must immediately inform the Regional Head of any change of name, address, premises and/or legal status.
4. If the property in respect of which this licence is issued is subdivided or consolidated, the licensee must provide full details of all changes in respect of the properties to the Regional Head of the Department within 60 days of the said change taking place.
5. If a water user association is established in the area to manage the resource, membership of the licensee to this association is compulsory.
6. The Licensee shall be responsible for any water use charges or levies imposed by a responsible authority.
7. While effect must be given to the Reserve as determined in terms of the Act, where a desktop determination of the Reserve has been used in issuance of a licence, when a comprehensive determination of the Reserve has finally been made, it shall be given effect to.
8. When compulsory licensing is implemented for the water resource in respect of which this licence was issued, the water use authorized in this licence could be subject to appropriate reduction.
9. The licence shall not be construed as exempting the licensee from compliance with the provisions of any other applicable Act, Ordinance, Regulation or By-law.
10. The licence and amendment of this licence are also subject to all the applicable procedural requirements and other applicable provisions of the Act, as amended from time to time.
11. The Licensee shall conduct an annual internal audit on compliance with the conditions of licence. A report on the audit shall be submitted to the Regional Head within one month of the finalisation of the audit.
12. The Licensee shall appoint an independent external auditor to conduct an annual audit on compliance with the conditions of this licence. The first audit must be conducted within 3 (three) months of the date this licence and a report on the audit shall be submitted to the Regional Head within one month of finalisation of the report.
13. Flow metering, recording and integrating devices shall be maintained in a sound state of repair and calibrated by a competent person at intervals of not more than two years.

Calibration certificates shall be available for inspection by the Regional Head or his representative upon request.

14. Any incident that causes or may cause water pollution shall be reported to the Regional Head or his/her designated representative within 24 hours.

APPENDIX II

Section 21(g) of the Act: Disposing of waste in a manner that may detrimentally impact on a water resource

1. **CONSTRUCTION AND OPERATION**
- 1.1 The Licensee shall carry out and complete all the activities, including the construction and operation of the Slimes Dam, Slag Dump and all return water / pollution control dams and the stormwater management system according to the report(s) and design plan(s) as approved by Chief Director.
- 1.2 All recovery dams, Coal stockpile, effluent control dams, dirty water dams, ash dump, storm water dirty dams must be lined according to minimum requirements second edition 1998 to prevent water resource impact. Proposed liner design must be submitted to the Department before construction take place, for approval.
- 1.3 Storage area for dirt oils must be bunded according to Departmental Minimum Requirement to avoid contamination of groundwater.
- 1.4 The construction of all aforementioned facilities must be carried out under the supervision of a professional Civil Engineer, registered under the Engineering Profession of South Africa Act, 1990 (Act 114 of 1990), as approved by the designer.
- 1.5 Within 30 days after the completion of the activities referred here in accordance with the relevant provisions of this license, the Licensee shall in writing, under reference 16/277/B100/B/174 inform the Regional Head thereof. A signature of approval from the designer shall accompany the correspondence referred to above that the construction was done according to the design plans referred to in the Report.
- 1.6 The Licensee must ensure that the disposal of the ash and operation of the dump are done according to the provisions in the Kusile Power Station ash dump complex construction manual to prevent water pollution.
- 1.7 The Licensee shall as well submit a set of as-built drawings to the Regional Head after the completion of the Ash dump.
- 1.8 The Ash Dams, and all other water management structures shall be operated and maintained to have a minimum freeboard of 0.8 metres above full supply level and all other water systems related thereto shall be operated in such a manner that it is at all times capable of handling the 1:50 year flood-event on top of its mean operating level.
- 1.9 All hazardous waste substances at the site must be accurately identified, adequately stored and disposed appropriately.
- 1.10 All dams must be lined with synthetic material, 2mm HDPE with a cusped HDPE leak detection layer sandwiched in-between.

2. STORAGE AND DISPOSAL OF WATER CONTAINING WASTE

2.1 The Licensee is authorised to operate and maintain the various pollution control facilities, for the purpose of collection, containment, and re-use as specified in this licence.

2.2 All waste management facilities are designed to produce zero effluent.

2.3 The Licensee is authorised to irrigate ash/gypsum dumps to suppress dust utilizing two hundred and forty six and ten cubic metres per annum (246 010 m³/a). The irrigation water will be supplied from the ash/gypsum dump dirty dam which will be supplemented from the holding/recycling dam when the need arise.

2.4 All storm water dams must be operated near to empty during the start of each rainy season to allow enough storage capacity to accommodate rain water.

2.5 Coal Storage Yard (CSY)

2.5.1 The Licensee is authorised to operate 852 000 m³ (eight hundred fifty two thousand cubic metres)of coal storage yard on the farm Hartebeestfontein 537 JR, in accordance with provisions made in the Report.

2.6 Ash/Gypsum Co-disposal Facility

2.6.1 The Licensee is authorised to dispose a maximum volume of 4 921 295 tons/a (four million nine hundred and twenty one thousand, two hundred and ninety five tons per annum) of ash/gypsum into the ash Dump on the farm Hartebeestfontein 537 JR in accordance with the provisions made in the Report.

2.7 Emergency Ashing Area

2.7.1 The Licensee is authorised to operate 13 975 m² emergency ashing area on the farm Hartebeestfontein 537 JR, in accordance with provisions made in the Report.

2.8 Station Dirty Dam

2.8.1 The Licensee is authorised to dispose of 284 510 m³/a (two hundred and eighty four thousand five hundred and ten cubic metres) of dirty water into the station Dirty Dam.

2.9 Temporary Stockpiling Coarse Ash

2.9.1 The Licensee is authorised to operate 13 975 m³ (thirteen thousand nine hundred and seventy five cubic metres) temporary stockpiling coarse ash facility on the farm Hartebeestfontein 537 JR, in accordance with provisions made in the Report.

2.10 Station Recycle/Holding Dam

2.10.1 The Licensee is authorised to dispose a maximum volume of 78 400 m³ (seventy eight thousand, four hundred cubic metres) of water containing waste in the Station Recycle/Holding Dam on the farm Hartebeestfontein 537 JR in accordance with the provisions made in the Report.

2.11 Pollution Control Dams

2.11.1 The Licensee is authorised to operate the following pollution control dams in accordance with the provisions made in the Report;

- o The station two dirty dam settling facility (2 x 184 453 m³) situated on farm Hartebeestfontein 566, Portion 0.
- o The coal stockyard/limestone building settling facility (4 977 m³) situated on farm Hartebeestfontein 566, Portion 1.
- o The two holding/recycle dams (2 x 35 623 m³) situated on farm Hartebeestfontein 566, Portion

3. WATER QUALITY AND QUANTITY

- 3.1 All Eskom operational areas where there is a possibility of ground and surface water impacts must be provided with bunding and containment infrastructure. All uncontrolled leakages from the plant must be investigated and mitigation measures must be proposed and implemented.
- 3.2 All temporary hazardous storage areas must have bunded walls built to capacity of the plant and be provided with sumps and pumps to return the spilled material back into the system, within acceptable safety and health practices.
- 3.3 The operation, and maintenance of all dam facilities classified as a dam with a safety risk, must be carried out under supervision of a professional Civil Engineer, registered under the Engineering Profession of South Africa Act, 1990 (Act 114 of 1990).
- 3.4 All storage facilities (for clean and dirty) with safety risk will comply with the following control measures:
- 3.4.1 The Licensee supply any information, drawings, specifications, design assumptions, calculations, documents and test results when requested by Regional Head.
- 3.4.2 An approved professional person must be appointed to carry out a dam safety evaluation annually and must consider whether the safety norms pertaining to design, construction, monitoring, operation, performance and maintenance of the dam satisfy acceptable dam engineering practices.
- 3.4.3 The Licensee must indicate on map, all dams, including return water dams, storage dams, stormwater dams, clean water dams and dirty water and their spatial relation to all monitoring points. Maximum capacity as well as normal operating capacity must be indicated. For each dam, the rainfall events that result in the dam overflowing and emergency plan must be submitted. This data must be made available to the Regional Head on request.

4. MONITORING

4.1 Surface Water Monitoring

4.1.1 The Licensee shall monitor surface water resources at upstream and downstream points within the drainage line to determine the impact of the facility and other activities on the water quality.

The following variables should be analysed.

- o pH
- o Alkalinity
- o Sulphate
- o Electrical Conductivity
- o Total Dissolved Solids (TDS)
- o Nitrate (NO₃ as N)
- o Phosphate
- o Chloride
- o Calcium
- o Magnesium
- o Sodium
- o Potassium
- o Aluminium

4.1.2. Surface water monitoring results shall be compiled into reports and submitted to the Department on the monthly basis.

4.1.3 The date, time and monitoring point in respect of each sample taken shall be recorded together with the results of the analysis.

4.1.4. Monitoring points shall not be changed prior to notification to and written approval by the Regional Head.

4.1.5 Toxicity testing must be conducted quarterly on the wastewater streams from the ash Dump and Coal stock Yard Pollution Control Dam when returned back to the plant for use as process water.

4.2 Groundwater Monitoring

4.2.1 The Licensee shall monitor ground water quality and levels at appropriate points within the drainage line to determine the impact of the facility on ground water.

4.2.2 Monitoring boreholes situated up and down stream of the ash dump must have a sampling tube.

4.2.3 Monitoring points shall be clearly marked and numbered, and must be equipped with lockable caps. The Department reserves the right to sample monitoring boreholes at any time and to analyse these samples, or to have samples taken and analysed.

4.2.4 The Licensee shall extend the current ground water monitoring program further up and downstream of the site.

4.2.5 The following variables shall be analysed for at the groundwater monitoring boreholes:

- o pH
- o Alkalinity
- o Sulphate
- o Electrical Conductivity
- o Total Dissolve Solids
- o Nitrate
- o Chlorine

- o Calcium
- o Magnesium
- o Sodium
- o Potassium
- o Aluminium,

- 4.2.6 Groundwater monitoring shall be compiled into reports and submitted to the Department on a quarterly basis, within one month of their finalisation.
- 4.2.7 The date, time and monitoring point in respect of each sample taken shall be recorded together with the results of the analysis.
- 4.2.8 Monitoring points shall not be changed prior to notification to and written approval by the Regional Head.
- 4.2.9 Toxicity testing must be performed on the monitoring boreholes on a quarterly basis in order to determine the risks to the environment. The data gathered in the investigation must be reported annually during March of each year to the Regional Head. If any toxicity levels exceeded, the Licensee must institute an investigation to determine the cause of toxicity.
- 4.2.10 The Licensee shall participate in any initiative such as Direct Estimation of Ecological Effect Potential (DEEEP) to determine the toxicity of complex tailings waste discharges. Both acute and chronic toxicity must be addressed and at least three taxonomic groups must be present when toxicity tests are performed.
- 4.2.11 Analysis shall be carried out in accordance with methods prescribed by and obtainable from the South African Bureau of Standards (SABS), in terms of the Standards Act, 1982 (Act 30 of 1982).
- 4.2.12 The methods of analysis shall not be changed without prior notification to and written approval by the Regional Head.

5. WATER RESOURCE PROTECTION

- 5.1 The impact of the activities of the Kusile Power Station shall not exceed the in-stream water quality objectives detailed in Table 5.1 (or resource quality objectives) as stipulated in the Ground water quality reserve for the area:

Table 5.1: Surface Water Resource Quality Objectives

Substance/ Parameter	Class 0
pH	6-9
Electrical Conductivity (EC) in mS/m	< 70
Calcium as Ca in mg/l	< 80
Magnesium as Mg in mg/l	< 70
Sodium as Na in mg/l	< 100
Chloride as Cl in mg/l	< 100
Sulphate as SO ₄ in mg/l	< 200
Fluoride as F in mg/l	< 0.7
Nitrate as NO ₂ in mg/l	< 6

- 5.2 The impact of the activities of the Kusile Power Station shall not exceed the ground water quality objectives detailed in Table 5.2 (or resource quality objectives) as stipulated in the groundwater quality reserve for the area.

Table 5.2: Groundwater Resource Quality limits

Variable	limits
pH	7.89
Electrical Conductivity	9.90
Sulphate (SO4)	3.37
Chloride (Cl)	3.87
Sodium (Na)	6.81
Magnesium (Mg)	3.91
Calcium (Ca)	5.39
Nitrate (mg/l)	0.69
Fluoride (mg/l)	0.11

6. REPORTING

- 6.1 The Licensee shall update the water balance annually and calculate the loads of waste emanating from the activities. The Licensee shall determine the contribution of their activities to the mass balance for the water resource and must furthermore cooperate with other water users in the catchment to determine the mass balance for the water resource reserve compliance point.
- 6.2 The Licensee shall submit the results of analysis for the monitoring requirements to the Regional Head on a monthly basis for surface water monitoring and on a quarterly basis for ground water monitoring, including interpretation of the results as well as time series analysis of the monitoring exercise under Reference number 16/2/7/B100/B/174.

7. STORM WATER MANAGEMENT

- 7.1 Clean and dirty water separation is applied such that storm water from clean areas will not mix with storm water emanating from dirty areas. All clean terrace storm drains will discharge directly into the natural water courses. Storm water runoff from dirty areas will be conveyed to the coal stock yard/limestone building settling facilities for removal of suspended solids.
- 7.2 Storm water leaving the Licensee's premises shall in no way be contaminated by any substance, whether such substance is a solid, liquid, vapour or gas or a combination thereof which is produced, used, stored, dumped or spilled on the premises.
- 7.3 Increased runoff due to vegetation clearance and/or soil compaction must be managed, and steps must be taken to ensure that storm water does not lead to bank instability and excessive levels of silt entering the stream.
- 7.4 Where necessary works must be constructed to attenuate the velocity of any storm-water discharge and to protect the banks of the affected watercourses

- 7.5 Storm-water control works must be constructed, operated and maintained in a sustainable manner throughout the impacted area.
- 7.6 Increased runoff due to vegetation clearance and/or soil compaction must be managed, and steps must be taken to ensure that storm-water does not lead to bank instability and excessive levels of silt entering the streams.
- 7.7 All storm-water that would naturally run across the pollution areas shall be diverted via channels and trapezoidal drains designed to contain the 1:50 year flood.
- 7.8 The polluted storm water captured in the storm water control dams shall be pumped to the settling facilities for recycling and reuse.

8. PLANT AREAS AND CONVEYANCES

- 8.1 Pollution caused by spills from the conveyances must be prevented through proper maintenance and effective protective measures especially near all stream crossings.
- 8.2 All reagent storage tanks and reaction units must be supplied with a bunded area built to the capacity of the facility and provided with sumps and pumps to return the spilled material back into the system. The system shall be maintained in a state of good repair and standby pumps must be provided.
- 8.3 Any hazardous substances must be handled according to the relevant legislation, relating to the transport, storage and use of the substance.
- 8.4 Any access roads or temporary crossings must be:
 - 8.4.1 Non-erosive, structurally stable and shall not induce any flooding or safety hazard; and
 - 8.4.2 Be repaired immediately to prevent further damage.

9. ACCESS CONTROL

- 9.1 Strict access procedures must be followed in order to gain access to the property. Access to the Ash dam/dump, storm water dams and drains, the coal stock yard, the bulk liquids storage area and all water management structures within the power station must be limited to authorised employees of the Licensee and their Contractors only.

10. CONTINGENCIES

- 10.1 Accurate and up-to-date records shall be kept of all system malfunctions resulting in non-compliance with the requirements of this licence. The records shall be available for inspection by the Regional Head upon request. Such malfunctions shall be tabulated under the following headings with a full explanation of all the contributory circumstances:
 - 10.1.1 Operating errors;
 - 10.1.2 Mechanical failures (including design, installation or maintenance);
 - 10.1.3 Environmental factors (e.g. flood);
 - 10.1.4 Loss of supply services (e.g. power failure); and
 - 10.1.5 Other causes.

- 10.2 The Licensee must, within 24 hours, notify the Regional Head of the occurrence or potential occurrence of any incident which has the potential to cause, or has caused water pollution, pollution of the environment, health risks or which is a contravention of the licence conditions.
- 10.3 The Licensee must, within 14 days, or a shorter period of time, as specified by the Regional Head, from the occurrence or detection of any incident referred above, submit an action plan, which must include a detailed time schedule, to the satisfaction of the Regional Head of measures taken to:
- 10.3.1 Correct the impacts resulting from the incident,
 - 10.3.2 Prevent the incident from causing any further impacts, and
 - 10.3.3 Prevent a recurrence of a similar incident.

11. AUDITING

- 11.1.1 The Licensee shall conduct an annual internal audit on compliance with the conditions of this licence. A report on the audit shall be submitted to the Regional Head within one month of finalisation of the report, and shall be made available to an external auditor should the need arise.
- 11.2 The Licensee shall appoint an independent external auditor to conduct an annual audit on compliance with the conditions of this licence. The first audit must be conducted within three (3) months of the date this licence was issued and a report on the audit shall be submitted to the Regional Head within one month of finalisation of the report.

12. INTEGRATED WATER AND WASTE MANAGEMENT

- 12.1 The Licensee must update the Integrated Water and Waste Management Plan (IWWMP), which must together with the Rehabilitation Strategy and Implementation Programme (RSIP), be submitted to the Regional Head for approval within one (1) year of the date of issuance of this licence.
- 12.2 The IWWMP and RSIP shall thereafter be updated and submitted to the Regional Head for approval, annually.
- 12.3 The Licensee must, at least 180 days prior to the intended closure of any facility, or any portion thereof, notify the Regional Head of such intention and submit any final amendments to the IWWMP and RSIP as well as a final Closure Plan, for approval.
- 12.4 The Licensee shall make full financial provision for all investigations, designs, construction, operation and maintenance for a water treatment plant should it become a requirement as a long-term water management strategy.
- 12.5 The applicant shall within twelve (12) months of issuance of the licence update both surface and groundwater monitoring programme to ensure that groundwater monitoring is expanded to include areas outside the boundaries of the station, and submit the monitoring results thereof to the Regional Head.

- 12.6 The anticipated water quantity and quality problems likely to arise in Catchment from the growth in industrial and mining activities, necessitates collaborative efforts between all the water users, including industries, mining, agriculture, etc. and government to ensure negative impacts are minimised. To this end, the following strategic activities are essential:
- 12.6.1 The formulation of the catchment management strategy for the Olifants Water Management Area.
- 12.6.2 Through the established forum the Licensee shall make every effort to contribute to projects aimed at addressing the Resource Quality limits of the catchment.
- 12.6.3 The Licensee shall determine the contribution of their activities to the mass balance for the water resource and must furthermore co-operate with other water users in the catchment to determine the mass balance for the water resource reserve compliance point.
- 12.7 The Licensee shall determine the contribution of their activities to the mass balance for the water resource and must furthermore co-operate with other water users in the catchment to determine the mass balance for the water resource reserve compliance point.
- 12.8 The Licensee shall classify waste generated by the power station within first year of the issuance of the licence.
- 12.9 Groundwater remediation plan must be developed and submitted to the Department and include at least but not limited to the following criteria:
- 12.9.1 Protective measures to progressively reduce potential sources of groundwater pollution;
- 12.9.2 The identification, quantification and mitigatory measures proposed to address the possible impact on the groundwater aquifer.
- 12.9.3 Description of the source and extent of groundwater pollution and soil contamination around all waste management facilities.
- 12.9.4 An appropriate groundwater monitoring programme and network
- 12.9.5 The description of existing pollution, the prediction of future pollution, verification of predicted values with time, and measures to address groundwater and associated surface water impacts in the short, medium and long term.
- 12.10 The Licensee shall compile and update a water balance on a quarterly basis and summarize the results of the water balance in the Report.

END OF LICENCE