



## water & sanitation

Department:  
Water and Sanitation  
REPUBLIC OF SOUTH AFRICA

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

I, **Tsunduka Khosa**, in my capacity as Acting Chief Director: Water Use Licencing Management, acting under authority of the powers delegated to me by the Acting Director General of the Department of Water and Sanitation, hereby authorise the following water uses in respect of this licence.

SIGNED: \_\_\_\_\_

DATE: 23/09/2021

**LICENCE NO: 06/B20F/CIBG/10792**  
**FILE NO: 27/2/2/B620/44/1**

**1. Licensee:**

**Eskom Holding SOC Limited: Kusile 60year Ash  
Dump Facility**

**Postal Address:**

Suit 46 Postnet  
Highveld  
1035

**2. Water uses**

- |     |                            |  |
|-----|----------------------------|--|
| 2.1 | Section 21 (b) of the Act: | Storing water, subject to conditions set out in Appendices I and II.   |
| 2.3 | Section 21(c) of the Act:  | Impeding or diverting the flow of water in a watercourse, subject to the conditions as set out in Appendices I and III               |
| 2.4 | Section 21(g) of the Act:  | Disposing of waste in a manner which may detrimentally impact on a water resource, subject to conditions as set out in Appendices IV |

**B10305**

2.5 Section 21(i) of the Act: Altering the bed, banks, course or characteristics of a watercourse, subject to the conditions as set out in Appendices I and V

### 3. Properties on which the use will be exercised

**Table 1: Property Details**

Activity	Farm Name	Farm Portion	Owner's name
Section 21(b) of the Act	Klipfontein 566 JR	Portions 9, 10, 11, 19, 25 and 66	Eskom Holdings Limited
Section 21(c) of the Act	Klipfontein 566 JR Dwaalfontein 565 JR	Portions 7, 9, 10, 11, 19, 21, 24, 25, 30, 40, 41, 42, 43, 44, 45, 47, 48, 49, 50, 51, 52, 53 Portion 1	Eskom Holdings Limited
Section 21(i) of the Act	Klipfontein 566 JR Dwaalfontein 565 JR	Portions 7, 9, 10, 11, 19, 21, 24, 25, 30, 40, 41, 42, 43, 44, 45, 47, 48, 49, 50, 51, 52, 53 Portion 1	Eskom Holdings Limited
Section 21(g) of the Act	Klipfontein 566 JR	Portion 10, 11 and 26	Eskom Holdings Limited

### 4. Licence and Review Period

4.1 This licence is valid for a period of Twenty (20) years from the date of issuance and it may be reviewed every five (5) years.

### 5. Reports Submitted

- Integrated Water and Waste Management Plan for Kusile 60year Ash Disposal Facility, compiled by Zitholele Consulting (Pty) Ltd, dated November 2015;
- Bio-physical study: Groundwater Assessment compiled by Zitholele Consulting (Pty) Ltd, dated February 2014;
- Wetland Delineation and Impacts Assessment Report, prepared by Wetland Consulting Services, (Pty) Ltd, dated January 2014; and,
- Geotechnical Investigation compiled by the Jones & Wagener Engineering & Environmental Consultants dated October 2015.

### 6. Definitions

"Any terms, words and expressions as defined in the National Water Act, 1998 (Act No.36 of 1998) shall bear the same meaning when used in this licence."

T.B

"Act"	the National Water Act, 1998 (Act 36 of 1998)
"Department"	the Department of Water and Sanitation
"Provincial Head"	The Provincial Head means the Head of Provincial Operations: Mpumalanga, Department of Water and Sanitation, Private Bag X11259, Nelspruit, 1200.
"Reports"	refers to the report entitled Kusile 60year Ash Disposal Facility, compiled by Zitholele Consulting (Pty) Ltd, dated November 2015 as well as all other related documentations and communication (emails, letters, verbal, etc.) related thereto.

## 7. Description of the activity

The Licensee is authorised in terms of section 21 (a), (b), (c), (i) (g) of the National Water Act (Act No. 36 of 1998) to use water for power generation related activities on Portions 7, 9, 10, 11, 19, 21, 24, 25, 26, 30, 40, 41, 42, 43, 44, 45, 47, 48, 49, 50, 51, 52, 53, 66 of farm Klipfontein 566 JR and portion 1 of farm Dwaalfontein 565 JR in the Olifants Water Management Area, in B20F Quaternary Catchment in Mpumalanga Region.



## APPENDIX I

### General conditions for the licence

1. This licence is subject to all applicable provisions of the National Water Act, 1998 (Act No.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 Provincial 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 Provincial 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. Rules, regulations and water management stipulation of such association must be adhered to.
6. 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.
7. The licence shall not be construed as exempting the Licensee from compliance with the provisions any other applicable Act, Ordinance, Regulation or By-law.
8. 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.
9. 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 Provincial Head within one month of the finalisation of the audit.
10. The Licensee shall appoint an independent external auditor to conduct an annual audit on compliance with the conditions of this licence.
11. Any incident that causes or may cause water pollution must be reported to the Provincial Head or his/her designated representative within 24 hours.

12. If the water use described in this licence is not exercised within three (3) years of the date of the licence, the authorisation will be withdrawn. Upon commencement of the water use, the Licensee must inform the relevant authority in writing.
13. The Licensee shall establish and implement a continual process of raising awareness amongst itself, its workers and stakeholders for the need for Water Conservation and Water Demand Management.
14. Notices prohibiting unauthorized persons from entering water use premises must be displayed.
15. The Department accepts no liability for any damage, loss or inconvenience of whatever nature, suffered as a result of/ amongst other things.
  - 15.1 Any force major event;
  - 15.2 Siltation of the resource; and
  - 15.3 Required Reserve releases



## APPENDIX III

### Section 21 (b) of the Act: Storing of water

#### 1. STORING OF WATER

1.1 The licence authorises Eskom Holding SOC Limited: Kusile 60year Ash Dump Facility on the storage of water per annum, based on table 2 below:

**Table 2: Section 21 (b) Water Use:**

Use of water	Maximum per annum (m <sup>3</sup> )	Property Description	Coordinates
Temporary Attenuation Dam D1	30 000 m <sup>3</sup>	Klipfontein 566 JR Portion 11	25°57'10.69" S 28°54'21.59" E
Temporary Attenuation Dam D2	40 000 m <sup>3</sup>	Klipfontein 566 JR Portions 10, 11, 19	25°57'24.10" S 28°54'26.80" E
Temporary Attenuation Dam D3A	15 000 m <sup>3</sup>	Klipfontein 566 JR Portion 19	25°57'31.81" S 28°54'27.52" E
Temporary Attenuation Dam D3B	30 000 m <sup>3</sup>	Klipfontein 566 JR Portion 10	25°57'32.94"S 28°54'36.17"E
Temporary Attenuation Dam D4A	30 000 m <sup>3</sup>	Klipfontein 566 JR Portion 19	25°57'38.12" S 28°54'25.03" E
Temporary Attenuation Dam D4B	25 000 m <sup>3</sup>	Klipfontein 566 JR Portion 9	25°57'41.26" S 28°54'46.86" E
Temporary Attenuation Dam D5A	30 000 m <sup>3</sup>	Klipfontein 566 JR Portion 19	25°57'43.51" S 28°54'24.55" E
Temporary Attenuation Dam D5B	30 000 m <sup>3</sup>	Klipfontein 566 JR Portion 9	25°57'46.64" S 28°54'49.94" E
Temporary Attenuation Dam D6A	30 000 m <sup>3</sup>	Klipfontein 566 JR Portion 19	25°57'50.01" S 28°54'24.23" E
Temporary Attenuation Dam D6B	19 200 m <sup>3</sup>	Klipfontein 566 JR Portion 9	25°57'54.20" S 28°54'56.09" E



Use of water	Maximum per annum (m <sup>3</sup> )	Property Description	Coordinates
Temporary Attenuation Dam D7A	25 000 m <sup>3</sup>	Klipfontein 566 JR Portion 19	25°57'58.45" S 28°54'25.47" E
Temporary Attenuation Dam D7B	10 800 m <sup>3</sup>	Klipfontein 566 JR Portion 9 and 30	25°58'2.47" S 28°54'59.10" E
Temporary Attenuation Dam D8A	25 000 m <sup>3</sup>	Klipfontein 566 JR Portion 19	25°58'7.16" S 28°54'24.27" E
Temporary Attenuation Dam D8B	7 500 m <sup>3</sup>	Klipfontein 566 JR Portion 9 and 30	25°58'11.51" S 28°55'5.75" E
Temporary Attenuation Dam D9	19 200 m <sup>3</sup>	Klipfontein 566 JR Portion 19	25°58'14.36" S 28°54'22.62" E
Permanent Attenuation Dam 10 with soak-away system	30 000 m <sup>3</sup>	Klipfontein 566 JR Portion 66	25°58'13.47" S 28°55'11.14" E
Permanent Clean Water Dam (CWD)	60 200 m <sup>3</sup>	Klipfontein 566 JR Portion 66	25°56'39.76" S 28°54'50.39" E
Stilling Basin 1	50 000 m <sup>3</sup>	Klipfontein 566 JR Portion 25	25°56'16.98" S 28°53'43.61" E
Stilling Basin 2	50 000 m <sup>3</sup>	Klipfontein 566 JR Portion 25	25°56'22.45" S 28°53'44.87" E

1.2 The licensee must obtain any proprietary rights or servitudes at their own cost.

1.3 The licensee is not exempted from compliance with any applicable Dam Safety Regulations.

## 2. MONITORING REQUIREMENTS

2.1 The Licensee shall monitor the quantity of water transferred to and from each of the dams set out in Condition 1 on a daily basis and submit this to the Provincial Director bi-annually.

2.2 The Licensee shall use this information to compile a water balance to manage the use of water optimally.

2.3 The Licensee shall provide information on the method on the flow measurement within one year from the date of issuance of this licence.

2.4 All flow gauging devices as provided in Condition 2.1 shall be maintained in a sound state of repair.

- 2.5 All flow gauging devices shall be calibrated by flow balancing by a competent and capable person, at intervals not exceeding one year.
- 2.6 The installation of flow meters shall comply with the specifications of the manufacturer with regard to distance from obstructions in the pipeline upstream and downstream of the meter to ensure accurate measurements.
- 2.7 Records confirming proof of the calibration must be kept and made available to the Provincial Head upon request.





## APPENDIX III

**Section 21(c) of the Act:** Impeding or diverting the flow of water in a watercourse  
and

**Section 21(i) of the Act:** Altering the bed, banks, course or characteristic of a watercourse

### 1. GENERAL

1.1 The licence authorises Eskom Holding SOC Limited: Kusile 60year Ash Dump Facility for section 21(c) and (i) water use activities as set out in **Table 3**.

**Table 3: Section 21(c) & (i) water use activities**

Description of activity/Purpose	Properties	Dimensions	Quaternary	Coordinates
60 Year ADF	Klipfontein 566 JR Portions 7, 9, 10, 11, 19, 21, 24, 25, 30, 40, 41, 42, 43, 44, 45, 47, 48, 49, 50, 51, 52, 53		B20F	Start 25°56'21.64"S 28°53'51.80"E End 25°56'58.65"S 28°55'48.87"E
Klipfontein River Diversion	Klipfontein 566 JR Portions 7, 9, 10, 11, 25, 26, 30, 40, 41, 42, 43, 44		B20F	Start 25°56'52.27"S 28°55'58.75"E End 25°56'19.40"S 28°53'49.50"E
Dams D1, D2, D3 A & B, D4 A & B, D5 A & B, D6 A & B, D7 A & B, D8 A & B, D9, D10	Klipfontein 566 JR Portion 9, 10, 11, 19, 30		B20F	Start 25°56'21.64"S 28°53'51.80"E End 25°56'58.65"S 28°55'48.87"E
Topsoil Stockpile	Dwaalfontein 565 JR Portion 1	810 000 m <sup>3</sup>	B20F	Start 25°57'44.79"S 28°53'22.43"E End 25°57'44.87"S 28°53'44.67"E
Emergency Ashing Facility	Klipfontein 566 JR		B20F	Start 25°55'49.50"S 28°54'1.24" E End 25°55'53.19"S 28°54'5.30"E

Description of activity/Purpose	Properties	Dimensions	Quaternary	Coordinates
Services Corridor	Klipfontein 566 JR Portions 3, 11, 25, 26		B20F	Start 25°55'07.21"S 28°53'42.72"E End 25°56'39.47"S 28°53'45.35"E
Conveyer Culvert 1 - Crossing over the stream diversion	Klipfontein 566 JR	Width – 122.9 m  Length – 242.8 m	B20F	Start 25°56'15.02"S 28°53'49.95"E End 25°56'21.98" 28°53'50.61"E
Conveyer Culvert 2 - Crossing over P01 the stream diversion	Klipfontein 566 JR	Width – 245.3 m Length – 125.5 m	B20F	Start: 25°56'18.38"S 28°54'8.63"E End: 25°56'27.13"S 28°54'11.21"E
60 Year ADF Site Offices & supporting facilities	Klipfontein 566 JR Portions 25 and 26		B20F	Start 25°56'6.10" S 28°53'42.48"E End 25°56'5.68" S 28°53'47.36"E
Stilling Basin 1	Klipfontein 566 JR Portion 25		B20F	Start 25°56'16.98"S 28°53'43.61"E End 25°56'21.68"S 28°53'49.66"E
Stilling Basin 2	Klipfontein 566 JR Portion 25		B20F	Start 25°56'22.45"S 28°53'44.87"E End 25°56'26.92"S 28°53'49.83"E
Pipeline transporting water between ADDD and PCD1	Klipfontein 566 JR	Length – 600 m	B20F	Start 25°56'22.60"S 28°53'56.25"E End 25°56'4.03" S 28°53'50.39"E

Description of activity/Purpose	Properties	Dimensions	Quaternary	Coordinates
Decommissioning of existing 22 KV power lines within the ADF and associated infrastructure footprint	Klipfontein 566JR Portions 9, 10, 11, 19, 21, 30, 43, 44, 45, 47, 48	Length – 7 000 m	B20F	Start 25°56'38.71"S 28°54'34.42"E End 25°57'20.22"S 28°55'46.02"E

*Note that the references to streams and wetlands with in this licence are according to the reports submitted to the Department.*

1.2 The Licensee must carry out and complete all activities according to the following:

1.2.1 Reports submitted to the Department,

1.2.2 Conditions of this licence; and

1.2.3 Any other written direction issued by the Provincial Head in relation to this licence.

1.3 No activity must take place within the 1:100-year flood line or the delineated riparian habitat, whichever is the greatest, or within 500 m radius from the boundary of any wetland unless authorised by this licence.

1.4 The conditions of the authorisation must be brought to the attention of all persons (employees, sub-consultants, contractors etc.) associated with the undertaking of this activities.

1.5 The Licensee must take such measures that are necessary to bind such persons to the conditions of this licence.

1.6 A copy of the water use licence and submitted reports must be on site at all times.

1.7 A suitably qualified person(s), appointed by the Licensee; must be responsible for ensuring that the activities are undertaken in compliance with the specifications as set out in reports submitted to the Department and the conditions of this licence.

## 2 FURTHER STUDIES AND INFORMATION REQUIREMENTS

For section 21 (c) and (i) water use activities:

2.1 No fundamental alterations of the work method statements, site plan(s) and drawings are allowed, unless a modification is requested and granted by the Provincial Head in writing.

- 2.2 No site activities must occur beyond the proposed site location of the erosion and sedimentation controls and marked limits of disturbance.
- 2.3 An Environmental Management Plan and rehabilitation plan for decommissioning of any of the section 21 (c) and (i) water use activities must be submitted five (5) years before commencing with closure to the Provincial Head for a written approval.

### **3. PROTECTIVE MEASURES**

#### **3.1 Storm water Management**

- 3.1.1 Storm water management practices must be constructed, operated and maintained in a sustainable manner throughout the project and must include but are not limited to the following:

- 3.1.1.1 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 watercourse(s);

- 3.1.1.2 Storm water must be diverted from construction works, access roads, linear infrastructure, shaft areas and borrow pits and must be managed in such a manner as to disperse runoff and to prevent the concentration of storm water flow;

- 3.1.1.3 The velocity of storm water discharges must be attenuated, and the banks of the watercourses protected;

- 3.1.1.4 Storm water leaving the Licensee's premises must 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;

- 3.1.1.5 Drainage next to the construction works, roads, stockpiles, the opencast pit, pollution control dams, mining area and watercourse crossings must be diverted away from the watercourse(s) to ensure that any contaminated runoff does not flow directly into the watercourse(s) as a storm water discharge;

- 3.1.1.6 All clean water drains and diversions to be constructed as natural as possible to resemble natural streams; and,

- 3.1.1.6 Sheet runoff from paved/hardened surfaces and access roads need to be curtailed.

#### **3.2 Structures, Construction Plant and Materials**

- 3.2.1 Necessary erosion prevention measures must be employed to ensure the sustainability of all structures.

- 3.2.2 The height, width and length of structures must be limited to the minimum dimension necessary to accomplish the intended function.

- 3.2.3 Structures must not be damaged by floods exceeding the magnitude of floods occurring on average once in every 100 years.
- 3.2.4 Structures must be non-erosive, structurally stable and must not induce any flooding or safety hazard.
- 3.2.5 Structures must be inspected regularly for accumulation of debris, blockage, erosion of abutments and overflow areas - debris must be removed and damages must be repaired and reinforced immediately.
- 3.2.6 The construction camp, plant and material stockpiles must be located outside the extent of the watercourse(s) and must be recovered and removed three (3) weeks after construction has been completed.
- 3.2.7 An erosion management procedure, including generic designs according to the slope (**Table 4**) shall be done by a registered, professional, Civil Engineer before mining or construction commences in order to prevent and correct erosion on the mine.

**Table 4: Erosion protection berm placement**

Track slope	Berm placement
<2%	Every 50 m
2% - 10%	Every 25 m
10% - 15%	Every 20 m
>15%	Every 10 m

- 3.2.8 All areas affected by construction should be rehabilitated upon completion of the construction phase of the development. Areas should be reseeded with indigenous vegetation species as required, and the use of seednets is recommended to prevent erosion.
- 3.2.9 During the construction phase no vehicles shall be allowed to indiscriminately drive through any wetland areas.
- 3.2.10 No construction is allowed within the 1:100-year floodline and/or delineated riparian habitat, whichever is the greatest, or within 500 m radius from the boundary of any wetland unless authorised by a licence.
- 3.2.11 A permanent fence shall be erected between the remaining wetland(s) and the mining activities to prevent entry into the wetland(s) by vehicles and to prevent further impacts on the wetlands. The fence must not impact on (avi) faunal activities.
- 3.2.12 No structures to be placed within the 1:100-year floodline and/or the delineated riparian areas unless authorised by a licence.



3.2.13 Any access roads, haul roads or other linear crossings should be:

- 3.2.13.1 Any damage is repaired immediately to prevent further damage;
- 3.2.13.2 Non-erosive, structurally stable and should not induce any flooding or safety hazard;
- 3.2.13.3 Non-polluting with respect to silt and litter that can be deposited into a watercourse;
- 3.2.13.4 Watercourse crossings to facilitate the movement of aquatic and non-aquatic organisms and fauna;
- 3.2.13.5 Crossing surfaces must be tarred or concreted along the extent of the watercourse and extent at least 100m beyond the extent of the watercourse to minimise impacts on the characteristics of the watercourse;
- 3.2.13.6 Where any road is within the 100m buffer zone of the watercourse, this portion of the road surface shall be such that it does not generate dust, result in erosion or prevent sediment flow into the river; and
- 3.2.13.7 Crossing surfaces must not consist of any sulphur, coal, carbonaceous containing and/or other polluting material, including spoils of this nature.

### 3.3 Water Quality

- 3.3.1 The Licensee must sample the water quality monthly at the monitoring points in the watercourse affected by mining both upstream and downstream of the activities as outlined in the monitoring plan approved by the Provincial Head.
- 3.3.2 Monitoring must continue until such a time that a closure certificate has been obtained.
- 3.3.3 Activities that lead to elevated levels of turbidity of any watercourse(s) must be prevented, reduced, or otherwise remediated. Activities must be scheduled to take place during the dry seasons when flows are lowest where reasonably possible. If this is not possible and if management measures have not been provided for in the reports submitted to the Responsible Authority, the Licensee must submit such to the Responsible Authority for a written approval before these activities commence. Natural in stream hydrology is to be used to determine which months constitute the low flow months.
- 3.3.4 The Licensee must ensure that the quality of water to downstream users does not decrease because of the Licensee's activities.
- 3.3.5 A qualified person must be appointed to assess the quality of water both upstream and downstream of the activities prior to commencement of construction.



- 3.3.6 Pollution of and disposal/spillage of any material into the watercourse must be prevented, reduced, or otherwise remediated through proper operation, maintenance and effective protective measures.
- 3.3.7 Vehicles and other machinery must be serviced well outside the 1:100-year flood line or delineated riparian habitat, whichever is the greatest. Oils and other potential pollutants must be disposed of at an appropriate licenced site, with the necessary safe disposal certificates
- 3.3.8 Any hazardous substances must be handled according to the relevant legislation relating to transport, storage and use of the substance and all storage facilities must be equipped with large, clearly readable material safety data sheets (MSDS).
- 3.3.9 All reagent storage tanks and reaction units must be supplied with a bunded area built to contain at least 110% of the capacity of the facility and provided with sumps and pumps to return the spilled material back into the system. The system must be maintained in a state of good repair and standby pumps must be provided.
- 3.3.10 The Licensee must manage hydrocarbons in terms of a hydrocarbon procedure to minimise the risk of pollutants entering the natural drainage system of the area. The procedure must address cleaning, maintenance and legal disposal of the contents of these traps.
- 3.3.11 Dust impact monitoring must ~~also be conducted~~ in wetlands and sensitive areas within 100m of present activities within the site three (3) times a year or in accordance with the dust monitoring plan.
- 3.3.12 The Licensee must sample and analyse annually all surface and groundwater monitoring points (within 1 km of operations which are directly affected by mining) for a full spectrum of heavy metals annually and submit this information to the Provincial Head.
- 3.3.13 The Licensee shall actively participate in any Catchment Management Agency's related activity.
- 3.3.14 Sulphide and carbon containing material and other material that has a risk of pollution within the 1:100-year floodline, the riparian habitat and the regulated area of a wetland shall be fully contained on a lined surface (including concrete) and equipped with functional and effective pollution control systems to ensure risk prevention to the watercourse(s), unless authorised in a licence.

#### 3.4 Flow

- 3.4.1 The Licensee must determine flood lines (1:50 and 1:100 year) prior to construction to ensure risks are adequately managed. Flood lines must be clearly indicated on the site plan(s) and drawings along with all wetland boundaries.

- 3.4.2 All activities that negatively affect catchment yield, hydrology and hydraulics must have authorisation. The Licensee must ensure that the overall magnitude and frequency of flow in the watercourse(s) does not decrease, other than for natural evaporative losses and authorised attenuation volumes.
- 3.4.3 Appropriate design and mitigation measures must be developed to minimise impacts on the natural flow regime at authorised crossings of the watercourse i.e. through placement of structures/supports and to minimise turbulent flow in the watercourse.
- 3.4.4 The development may not impede natural drainage lines unless authorised by a licence.
- 3.4.5 All rock and rubble must be removed from the watercourse once construction has been completed. Any rock placed in the watercourse to enhance the dissolved oxygen content of the water must adhere to the same criteria, only smooth rock surfaces to be placed within the watercourse.

### **3.5 Riparian and Instream Habitat (Vegetation and Morphology)**

- 3.5.1 Activities (including spill clean-up) must start up-stream and proceed into a down-stream direction, so that the recovery processes can start immediately, without further disturbance from upstream works.
- 3.5.2 Operation and storage of equipment must not take place within the 1:100-year flood line and/or delineated riparian habitat and/or the regulated area of a wetland, whichever is the greatest unless authorised by a licence.
- 3.5.3 Activities must not occur in sensitive riffle habitats unless authorised by a licence.
- 3.5.4 Indigenous riparian vegetation, including dead trees, outside the limits of disturbance indicated in the site plans must not be removed from the area.
- 3.5.5 Alien and invader vegetation must not be allowed to further colonise the area, and all new alien vegetation recruitment must be sustainably eradicated or controlled.
- 3.5.6 Existing vegetation composition must be maintained or improved by maintaining the natural variability in flow fluctuations. Rehabilitated areas shall have a vegetation basal as stipulated in the EMP.
- 3.5.7 Recruitment and maintaining of a range of size classes of dominant riparian species in perennial channels must be stimulated.
- 3.5.8 Encroachment of additional exotic species and terrestrial species in riparian zones must be discouraged.

- 3.5.9 Accumulation of woody debris on terraces by periodic flooding must be discouraged.
- 3.5.10 Existing flood terraces and deposition of sediments on these terraces to ensure optimum growth, spread and recruitment of these species must be maintained.
- 3.5.11 Necessary erosion prevention mechanisms must be employed to ensure the sustainability of all structures and activities and to prevent instream sedimentation.
- 3.5.12 Soils that have become compacted through the water use activities must be loosened to an appropriate depth to allow seed germination.
- 3.5.13 Slope/bank stabilisation measures must be implemented with a 1:3 ratio or flatter and vegetated with indigenous vegetation as soon as possible after the shaping.
- 3.5.14 Stockpiling of removed soil and sand must be stored outside of the 1:100 flood line and/or delineated riparian habitat and/or the regulated area of a wetland, whichever is the greater.
- 3.5.15 The indiscriminate use of machinery within the instream and riparian habitat will lead to compaction of soils and vegetation and must therefore be strictly controlled.
- 3.5.16 The overall macro-channel structures and mosaic of cobbles and gravels must be maintained at authorised crossings by ensuring a balance (equilibrium) between sediment deposition and sediment conveyance maintained. A natural flooding and sedimentation regime must thus be ensured as far as reasonably possible.
- 3.5.17 As much indigenous vegetation growth as possible should be promoted within the proposed development area in order to protect soil and to reduce the percentage of the surface area which is paved, hardened and/or compacted.
- 3.5.18 Run-off from paved, hardened and compacts surfaces should be slowed down by the strategic placement of berms.
- 3.5.19 Unless authorised by a licence, access and haul roads must not encroach into the extent of the watercourse(s).
- 3.5.20 Storm water and run-off must be gently directed towards grasslands from where it migrates to watercourse(s).
- 3.5.21 No further encroachment of any mining activities is allowed into any of the wetland systems on site and within the regulated area of a wetland, unless authorised in this licence.
- 3.5.22 Any medicinal, sensitive and protected plants that are impacted upon in the wetlands must be assessed by the Responsible Authority or a registered, professional specialist and

relocated, if necessary, to a suitable site. This activity must take place at least thirty (30) days prior to the construction in wetland areas and proof must be submitted to the Provincial Head for written approval.

### 3.5 Biota

- 3.6.1 The Licensee must take all reasonable steps to allow movement of aquatic species, including migratory species.
- 3.6.2 All reasonable steps must be taken not to disturb the breeding, nesting and/or feeding habitats and natural movement patterns of aquatic biota.
- 3.6.3 The current level of diversity of biotopes and communities of animals, plants and microorganisms must be maintained on areas outside mine affected areas.

## 4. REHABILITATION AND MANAGEMENT

- 4.1 The Licensee must embark on a systematic long-term rehabilitation programme to restore the watercourse(s) to environmentally acceptable and sustainable conditions after completion of the activities, which must include, but not be limited to the rehabilitation of disturbed and degraded riparian areas to restore and upgrade the riparian habitat integrity to sustain a bio-diverse riparian ecosystem.
- 4.2 All disturbed areas must be re-vegetated with an indigenous seed mix as per EMP commitments ensuring that during rehabilitation only indigenous shrubs, trees and grasses are used in restoring the biodiversity.
- 4.3 An active campaign for controlling invasive species must be implemented within disturbed zones to ensure that it does not become a conduit for the propagation and spread of invasive exotic plants.
- 4.4 Shaping of spoils to be conducted in accordance with the rehabilitation plan.
- 4.5 Surrounding seeds must be harvested as part of rehabilitation.
- 4.6 Topsoil must be stripped and redistributed. Topsoil stockpiles' height is restricted to 3 m in order to preserve the soil's microbiological and nutrient characteristics. Topsoil must be placed immediately after stripping. No mixing of subsoil and topsoil to occur and must be documented in an approved EMP. Sufficient topsoil must be stored correctly.
- 4.7 The Licensee must implement rehabilitation of all stockpiles, dams and residue deposits in accordance with the final rehabilitation plan to minimise dust pollution on the wetlands that might alter the wetland's characteristics and must be monitored and recorded closely.

- 4.8 A photographic record must be kept as follows and submitted with reports:
- 4.8.1 Dated photographs of all the sites to be impacted before construction commences;
  - 4.8.2 Dated photographs of all the sites during construction on a monthly basis; and
  - 4.8.3 Dated photographs of all the sites after completion of construction, for the first three years.
- 4.9 Rehabilitation structures must be inspected regularly for the accumulation of debris, blockages instabilities and erosion with concomitant remedial and maintenance actions.
- 4.10 A comprehensive and appropriate rehabilitation and management programme to restore the watercourse(s) to environmentally acceptable and sustainable conditions after construction must be developed and submitted to the Provincial Head for written approval within one (1) month after completion of the construction activities.
- 4.11 After the backfill has subsided the final contours must follow the surrounding contours as far as possible to stop irregular flows or blockage of biotic movement.
- 4.12 A Wetland Management and Rehabilitation Plan for construction activities at the authorized crossings must be compiled by a professional, independent, qualified and registered wetland specialist when wetlands are affected and submitted to the Provincial Head for written approval within six (6) month after completion of the activities.
- 4.13 The characteristic wetland soils of wetlands that will be impacted by the mining activities must be stripped, stockpiled and dealt with in accordance with specialist advice in accordance of the approved EMP.
- 4.14 The impacts on various watercourses due to mining activities must be offset onsite on un-mined land areas and focus on improving the existing ecosystem services provided and functionality. Focus must also be on the overall PES and EIS status in the affected catchments with the release of treated mine water into these catchments. A plan to achieve this condition must be done in consultation with all relevant stakeholders and submitted to the Provincial Head for approval within one (1) year after the commencing of mining activities.

## 5. MONITORING AND REPORTING

- 5.1 The Responsible Authority must be notified in writing one week prior to commencement of the licenced activities and again upon completion of the activities.
- 5.2 The Licensee must ensure Water Quality and Bio-monitoring is ongoing.



- 5.3 Six (6) monthly monitoring reports must be submitted to the Responsible Authority in accordance with the monitoring plan as agreed in writing with the Provincial Head.
- 5.4 The Licensee must apply in writing to the Provincial Head for alternative reporting arrangements for which written approval must be provided.
- 5.5 A professional, qualified and registered wetland specialist be appointed to monitor the compliance to the wetland management and conditions in this licence pertaining to all impacts on wetlands and provide specialist advice for corrective actions and compile audit reports which must be submitted to the Provincial Head every five years.

## **6. OTHER WATER USERS**

- 6.1 The Licensee must prevent adverse effect on other water users. All complaints must be investigated by a suitable qualified person and if investigations prove that the Licensee has impaired the rights of other water users, the Licensee must initiate suitable measures.

## **7. POLLUTION PREVENTION, INCIDENTS AND MALFUNCTIONS**

- 7.1 Pollution incidents shall be dealt with in accordance with Section 19 and 20 of the Act.
- 7.2 Any incident that may cause pollution of any water resource shall immediately be reported to the Provincial Head.
- 7.3 If surface and/or groundwater pollution has occurred or may possibly occur, the Licensee must conduct, and/or appoint specialists to conduct the necessary investigations and implement additional monitoring, pollution prevention and remediation measures to the satisfaction of the Provincial Head.
- 7.4 The Licensee shall keep all records relating to the compliance or non-compliance with the conditions of this licence in good order. Such records shall be made available to the Provincial Head within 14 (fourteen) days of receipt of a written request by the Department for such records.
- 7.5 The Licensee shall keep an incident report and complaints register, which must be made available to any external auditors and the Department.

## **8. BUDGETARY PROVISIONS**

- 8.1 The Licensee must ensure that there is a budget sufficient to complete and maintain the water use and for successful implementation of the rehabilitation programme as set out in this licence.
- 8.2 The Provincial Head may at any stage of the process request proof of budgetary provisions for rehabilitation and closure of project.

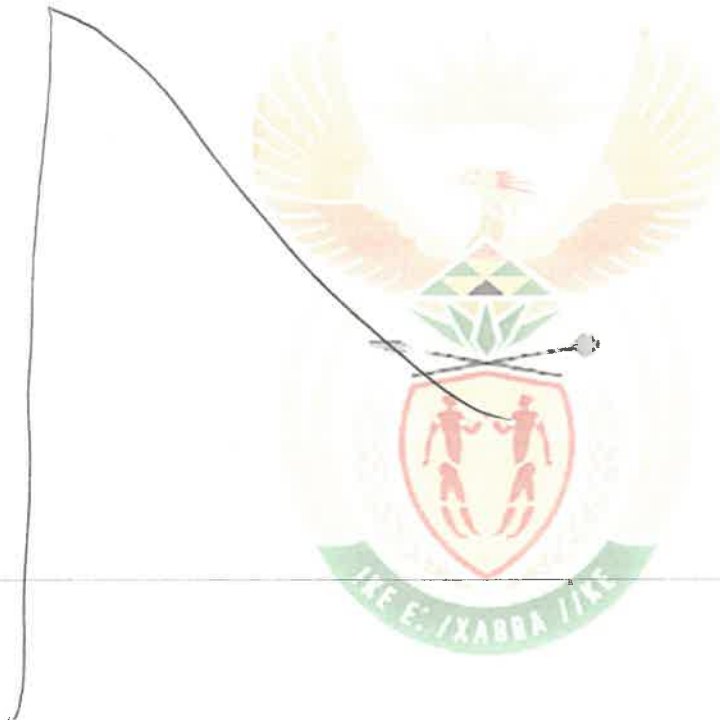


- 8.3 The Licensee is fully responsible and accountable for negative impacts on the watercourse(s) as a direct result of the activities and be responsible for the modelling, monitoring and mitigation thereof, until such time that closure certificate is issued.
- 8.4 The Licensee shall update and submit the following to the relevant Provincial Heads as required by legislation annually:
- 8.4.1 Financial liability for (post-closure) water treatment to catchment standards be compiled by a suitably qualified person. Financial provision for rehabilitation, water treatment and wetland rehabilitation commitments must be included in the station's financial provisioning by the Licensee.
- 8.4.2 Conduct annual focus group (adjacent landowners and directly affected parties) meetings on the conditions of this licence.
- 8.4.3 Provide information on any unauthorised activities and the reasons therefore.

## **9. SITE SPECIFIC CONDITIONS**

- 9.1 The licensee must submit within 6 months an A1 Descriptive Master Plan to scale of all infrastructure, watercourses, diversions, circulation, watercourse crossings.
- 9.2 The licensee must draw up and submit Detailed Rehabilitation Plan within 6 months, that will inter alia include:
- 9.2.1 All wetlands and rivers impacted upon up to the confluence with the Wilge River.
- 9.2.2 Degraded river and wetland sections must be rehabilitated up to the confluence.
- 9.2.3 Rehabilitation of side slopes of ash facility must be concurrent with development of facility and not steeper than 1:3. Side slopes must be protected against erosion, topsoiled and re- vegetated.
- 9.2.4 Rehabilitation team and equipment must be detailed.
- 9.2.5 Plant Species Plans must be drawn up by a landscape architect, river ecologist, botanist, wetland specialist or combination of them for the Holfontein Spruit River and Klipfonteinspruit River and associated wetlands up to the confluence of the Wilge River.
- 9.3 Ecological Management class of rivers and wetlands must stay the same before and after.
- 9.4 The licensee must submit the following detailed reports within 6 months:
- 9.4.1 Stormwater Water Management;
- 9.4.2 Water Resource and Water Balance;
- 9.4.3 Waste and Sewer Management Plan; and,
- 9.4.4 Water quality and Bio-monitoring Plan and Programme.
- 9.5 Waters lost to these rivers and wetlands because of the ash dump and New Largo cone of depression impacts must be modelled and Recharge Plans and Programmes submitted to the Provincial Head for approval within 6 months:

- 9.5.1 Water lost to the system must be sourced elsewhere and discharge again to maintain the ecological class of the rivers and wetlands. Details to be provided.
- 9.5.2 Water of an acceptable aquatic quality must be discharged. Design of discharge points to be detailed as bio retention wetland ponds.
- 9.5.3 Dirty water from filter drains below the ash dump must be treated to an acceptable quality before discharge. Water from drains to be measured.
- 9.5.4 Water losses from sub- surface flows must be modelled.
- 9.6 Ash facility leachate protection system must be detailed and submitted. Leak detection system to be implemented and submitted for approval. The licensee must ensure liner of facility has been approved (i.e., Civil Designs must be approved by Department).
- 9.7 Diversions must be made as natural as possible via use of shaping to 1:3 or flatter, use of rock, rock mattresses, topsoil, vegetation
- 9.8 The licensee must ensure dust and noise is controlled sufficiently.



## APPENDIX IV

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

#### 1. CONSTRUCTION, OPERATION AND MAINTANANCE

- 1.1 The Licensee shall carry out and complete all the activities, including the construction and operation of the facilities listed in Table 5, according to the Report and according to the final plans submitted with the Integrated Water Use Licence Application as approved by the Provincial Head.
- 1.2 The construction and operation of the waste containment facilities listed must be carried out under the supervision of a professional Civil Engineer, registered under the Engineering Profession of South Africa Act, 1990 (Act No. 114 of 1990), as approved by the designer.
- 1.3 The Licensee is authorised to dispose of a maximum quantity in cubic metres (m<sup>3</sup>) of waste water per annum into the waste management facility on the properties as described in Table 5.
- 1.4 The water containing waste containment facilities must be designed in such a manner that any spillage can be contained and reclaimed without any impact on the surrounding environment, a plan must be in place to stop overflowing in a dam in case of rainy seasons.
- 1.5 The licensee must ensure that the disposal of the waste water and the operation and maintenance of the system are done according to the provision in the report.
- 1.6 The Licensee shall as well submit a set of as-built drawings to the Provincial Head within one (1) month after the completion of the waste facilities listed in Table 2.
- 1.7 The waste facilities listed 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.
- 1.8 The Licensee shall use acknowledged methods for sampling and the date, time and sampler must be indicated for each sample.

#### 2. STORAGE OF WATER CONTAINING WASTE

- 2.1 The Licensee is authorised to dispose of a maximum quantity in cubic meters (m<sup>3</sup>) of waste per annum into the waste management facility on the properties described in **Table 5**.

**Table 5: Section 21(g) water uses**

Description	Properties	Volume (m <sup>3</sup> /a) or t/a	Capacity (m <sup>3</sup> ) or Footprint (ha)	Quaternary catchment	Coordinates
60 Year ADF	Klipfontein 566 JR		532 170 000 m <sup>3</sup>	B20F	25°56'21.64" S 28°53'51.80" E
Emergency Ash Facility (E-dump)	Klipfontein 566 JR		255 150 m <sup>3</sup>	B20F	25°55'49.50"S 28°54'1.24" E
Pollution Control Dam 1	Klipfontein 566 JR Portion 11 and 26		113 000 m <sup>3</sup>	B20F	25°56'21.58" S 28°53'52.61" E
Pollution Control Dam 2	Klipfontein 566 JR Portion 11 and 26		151 200 m <sup>3</sup>	B20F	25°56'32.82" S 28°53'53.77" E
Pollution Control Dam 3	Klipfontein 566 JR Portion 26		62 400 m <sup>3</sup>	B20F	25°56'34.03" S 28°54'22.44" E
Pollution Control Dam 4	Klipfontein 566 JR Portion 26		63 000 m <sup>3</sup>	B20F	25°56'35.50" S 28°54'29.60" E
Pollution Control Dam 5	Klipfontein 566 JR Portion 10 Portion 26		63 000 m <sup>3</sup>	B20F	25°56'36.90" S 28°54'36.57"E
Pollution Control Dam 6	Klipfontein 566 JR Portion 10		63 000 m <sup>3</sup>	B20F	25°56'38.31" S 28°54'43.47" E
Dust Suppression	Klipfontein 566JR	57 166 m <sup>3</sup> /a		B20F	Around the ash dump facility

### 3. MONITORING

- 3.1 The Licensee shall monitor on monthly basis the water resources at surface water monitoring points and ground water monitoring points and on a biannual basis conduct bio monitoring to determine the impact of the facilities and other activities on the water quality by taking samples at the monitoring points.
- 3.3 The date, time and monitoring point in respect of each sample taken shall be recorded together with the results of the analysis.
- 3.4 The licensee shall use acknowledged methods for sampling and date, time and sampler must be indicated for each.
- 3.5 A continuous groundwater monitoring programme must be implemented. Groundwater quality must be monitored on a quarterly basis by using approved groundwater sampling techniques

and analysed by an accredited laboratory. Groundwater level must be monitored on a monthly basis.

- 3.6 Monitoring points shall not be changed prior to notification to and written approval by the Provincial Head.
- 3.7 An Aquatic Scientist approved by the Provincial Head must establish a monitoring programme for the following indices: Invertebrate Habitat Assessment System (IHAS) and the latest SASS (South African Scoring System). Sampling must be done once during the summer season and once during the winter season, annually or as indicated by the scientist, to reflect the status of the river upstream and downstream of the mining activities.
- 3.8 Water quality testing to be performed on all coal disposal facilities, on a quarterly basis in order to determine the risks to the receiving environment. The data gathered in the investigation must be reported annually to the Provincial Head. If any concentrations levels as specified above are exceeded, the Licensee must institute an investigation to determine the cause of poor water quality.
- 3.9 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).
- 3.10 The methods of analysis shall ~~not be changed~~ without prior notification to and written approval by the Minister.
- 3.11 Monitoring boreholes 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.
- 3.12 The approved monitoring plan must include appropriate groundwater monitoring requirements as well as background monitoring.
- 3.13 The Licensee shall maintain groundwater quality monitoring network to the satisfaction of the Provincial Head, so that unobstructed sampling, as required in terms of this licence, can be undertaken.
- 3.14 The Licensee shall monitor the direct impacts associated with the disposal of waste and report to the Provincial Head in accordance with the approved monitoring plan.
- 3.15 The Licensee shall monitor groundwater and use the results to determine whether there is an impact of the activities on users within the zone of impact.



- 3.16 The Licensee shall use acknowledged methods for borehole sampling and the date, time, sampler and borehole number must be indicated for each sample.
- 3.17 No groundwater abstraction may take place within 100 m of river, spring or wetland unless authorized. Provincial Operation if deemed necessary may increase this distance.
- 3.18 If, in the opinion of the Provincial Head, water pollution may be or is occurring, or a water quality variable at any monitoring point shows an increasing trend, the Licensee shall initiate an investigation into the cause of the problem or suspected problem.
- 3.19 Conceptual model used for groundwater assessment must be revised every 3 years as monitoring data becomes available in order to make knowledgeable decisions of geohydrological regime
- 3.20 Numerical models used for groundwater assessment must be updated in order to make knowledgeable decisions of the geohydrological regime. The model must be calibrated and updated on an annual basis as monitoring data is available.

#### **4. REPORTING**

- 4.1 The Licensee shall update the water balance annually and calculate the loads of waste emanating from the activities. The Licensee shall determine where possible 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.
- 4.2 The Licensee shall submit the results of analysis for the monitoring requirements to the Provincial Head on a quarterly basis under Reference number: **27/4/2/1/B200/B174**
- 4.3 ~~The licensee shall submit the natural and the quality of the waste disposed into all water containment facilities.~~
- 4.4 The license holder shall inform the authorities thirty (30) days in advance of commencement of construction works for the waste discard dump.
- 4.5 The Engineers certificate of completion of work in accordance with the accepted design and CQA plan shall be provided to the DWS with supporting evidence of construction quality assurance implementation of the design during construction, prior to use.

#### **5. STORMWATER MANAGEMENT**

- 5.1 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.



- 5.2 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.
- 5.3 Storm water shall be diverted from the mine complex site and roads and shall be managed in such a manner as to disperse runoff and concentrating the Storm water flow.
- 5.4 Where necessary works must be constructed to attenuate the velocity of any Storm water discharge and to protect the banks of the affected watercourses.
- 5.5 Storm water control works must be constructed, operated and maintained in a sustainable manner throughout the impacted area.
- 5.6 All storm water that would naturally run across the pollution areas must be diverted via channels and trapezoidal drains designed to contain the 1:50-year recurrence interval flood.
- 5.7 increase 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.
- 5.8 The polluted storm water system must be designed and implemented to provide suitable routing and pumping capacity for contaminated storm water from the individual facilities to the respective storm water dams in accordance with the design specifications as contained in the Integrated Water Use Licence Application report or the latest updated storm water management plan for the mine.
- 5.9 The polluted storm water captured in the storm water control dams shall be reused and recycled.

## **6. ACCESS CONTROL**

- 6.1 Strict access procedures must be followed in order to gain access to the property. Access to the Ash Damp must be limited to authorised employees of the licensee and their constructor only
- 6.2 Notices prohibiting unauthorised persons from entering the facilities, as well as an internationally accepted sign indicating the risks involved in case of and unauthorised entry must be displayed along the boundary fence of these area.
- 6.3 The Licensee must ensure effective access control on the mine residue facility to reasonably prevent entry of domestic animals, game and unauthorised persons while the solid waste disposal sites are operative and during the period of construction for closure.
- 6.4 The Licensee must take all reasonable steps to maintain service roads in a condition which ensures unimpeded access to the mine residue facility for vehicles involved in closure construction and/or transporting waste and must keep these roads free of waste.

- 6.5 The Licensee must ensure that all entrance gates are manned during the hours of operation/closure construction and locked outside the hours of operational/closure construction.

## 7. CONTINGENCIES

- 7.1 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 Provincial Head upon request. Such malfunctions shall be tabulated under the following headings with a full explanation of all the contributory circumstances:

7.1.1 Operating errors

7.1.2 Mechanical failures (including design, installation or maintenance)

7.1.3 Environmental factors (e.g. flood)

7.1.4 Loss of supply services (e.g. power failure) and

7.1.5 Other causes.

- 7.2 The Licensee must, within 24 hours, notify the Provincial 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.

- 7.3 The Licensee must, within 14 days, or a shorter period of time, as specified by the Provincial 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 Provincial Head of measures taken to:

7.3.1 Correct the impacts resulting from the incident

7.3.2 Prevent the incident from causing any further impacts and

7.3.3 Prevent a recurrence of a similar incident.

## 8. AUDITING

- 8.1 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 Provincial Head within one (1) month of finalisation of the report, and shall be made available to an external auditor should the need arise.

- 8.2 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 6 (six) months of the date this licence was issued and a report on the audit shall be submitted to the Provincial Head within one month of finalisation of the report.

## 9. INTEGRATED WATER AND WASTE MANAGEMENT

- 9.1 The Licensee must update an *Integrated Water and Waste Management Plan* (IWWMP), which must together with the updated *Rehabilitation Strategy and Implementation Programme* (RSIP), be submitted to the Provincial Head for approval within one (1) year from the date of issuance of this licence.
- 9.2 The action plan for the IWWMP and RSIP shall be updated and submitted to the Provincial Head for approval, annually.
- 9.3 The Licensee must, at least 180 days prior to the intended closure of any facility, or any portion thereof, notify the Provincial Head of such intention and submit any final amendments to the IWWMP and RSIP for approval.
- 9.4 The Licensee shall make full financial provision for all investigations, designs; construction, operation and maintenance for a water treatment plant shall it become a requirement as a long-term water management strategy.

## 10. SITE SPECIFIC CONDITIONS

- 10.1 The licensee shall submit at the end of each phase of barrier construction, the normal 1,5m high starter wall embankment shall be surveyed and the updated list of co-ordinates of each point of intersection be included in the construction completion report and forwarded to the authorities along with certificate of completion and its supporting evidence.
- 10.2 Due to the service life determination in the design report being limited to temperature assumptions alone and not recognizing the effects of tensile stain on the GM performance, the license holder shall (i) include at least 3 thermocouples midway between herringbone drains to confirm temperature assumptions in the GM such as during construction placement of the pioneering ash layer in the trial pad (albeit part of the final footprint) and at the GM/concrete outlet works make-off in the PCD embankment penetration.
- 10.3 The licensee must insure that the standard specification for materials and methods employed in the waste containment be revised to the latest version thereof including SANS 1526(2015) of HDPE GMs revised (in 2019) and SANS 10409 specified as 2015 shall be revised to the 20202 version, amongst others.
- 10.4 Compacted clay liner permeability shall be confirmed by double ring infiltrometer tests or similar approved on each layer at at-least three positions for each five-year phase on the in-situ material (as per the minimum Requirements 1998). The results of all permeability test shall be included in the construction completion report (noting the nature of CCL material described and recorded as  $10^{-5}$  cm/s or less, compared to the norms and standards).
- 10.5 The ADF and PCD developments shall include instrumentation to confirm the design and construction assumptions made which influence containment performance such as confirming the above liner piezometric level and GM tensile strain limitation (in particular adjacent to the concrete outlet works of the PCDs).

- 10.6 Due to failure of the license holder and Zitholele Consulting Engineers to provide the design report appendices and CQA plan as referenced in the 2018 report until March 2021, and discrepancies between tender documentation and the design report the license holder shall comply with the DWS standard CQA plan (available on the DEFF website) as a minimum with all deviations therefrom being agreed to in writing prior to commencement of construction. Noting the need to comply with Treasury Regulations in respect of product specifications.
- 10.7 Due to contradictions between the 2018 design report, the 2020 design addenda and in particular technical memorandum design addendum, the CQA shall include an Electric Leak Location Survey in accordance with D8265 or similar approved amendment with deviation or relaxation for cost saving based on confirmed competence of the lining material and installer, including certificated/accredited welding technician.
- 10.8 Reference Procedures, Standards and Specifications (Works specification) for Kusile ADF: Due to the undated 181 page standards and specification documents referenced by the CQA requiring the textured HDPE geomembrane/CCL interface shear peak value to be 34 degrees and residual 21 degrees requirements respectively, being in contradiction with the design report which references published literature (giving a peak textured GM/CCL interface shear of 18 degrees and residual of 16 degrees), the design and tender documentation is considered contradictory and unsound. Thus the requirement for the lining contractor to timeously demonstrate possibly impractical values, which tends to show a predetermined brand of product, the license holder shall confirm the consulting engineer's specification is reasonable and ~~not anti-competitive~~ (in accordance with the PFMA and Treasury Regulations) for in-situ material prior to award of tender.
- 10.9 Filter compatibility between granular and geosynthetic filters and base material of ash or soil shall be confirmed as being in accordance with current internationally accepted norms and standards for the material on-site. The confirmation shall be included in the construction completion report, conforming CQA implementation.
- 10.10 Stability confirmation using site materials: the ADF and PCDs stability minimum FoS shall be confirmed post construction for the actual materials using and ash to be disposed (which is already in production). This confirmation shall be in writing to the authorities prior to use for use for disposal or pollution control.
- 10.11 The licensee shall monitor the area in front of the advancing ash stack toe for signs of deformation in the barrier system/foundation and report such to the authorities as an incident within 24 hours of occurrence.
- 10.12 The Engineers certificate of completion shall be augmented by a construction completion report confirming compliance with conditions of authorization and the CQA plan as amended. This report shall include a statistical analysis of test report on all materials used as per the specifications and record the nature of the test methods, number of tests, minimum, maximum and mean values and standard deviation as well as the number of failures encountered and performance of repairs.

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- 10.13 The licensee shall maintain monthly records of clean and dirty water volumes during the operational phase, including inter PCD flows. Such monthly monitoring results are to be made available to the authorities annually and be used to inform the license review every 5 years as well as the water conservation and demand management plan.
- 10.14 Due to large shallow PCDs and predicted water losses with resultant make-up water requirements, the licensee shall develop and implement a water conservation and demand management plan which pursues water use efficiency and pollution control.

**[END OF LICENCE]**

