




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, **Sifiso Mkhize**, in my capacity as Director-General (Acting) in the Department of Water and Sanitation (herein after referred to as the Department) and acting under authority of the powers delegated to me by the Minister of Water and Sanitation, hereby authorise the following water use in respect of this licence:

SIGNED: 

DATE: 07/12/2017

LICENCE NO: 06/B11F/CGIHE/6684
FILE NO: 27/2/1/B611/2/1

1. **Licensee:** ACWA Power Khanyisa Thermal Power Station (RF) Pty Ltd
Postal Address: PO Box 650200
Benmore
2010
2. **Water Uses**
 - 2.1 Section 21(c) of the Act: Impeding or diverting the flow of water in a watercourse, subject to the conditions set out in Appendices I and II.
 - 2.2 Section 21(e) of the Act: Engaging in a Controlled Activity; Irrigation of any Land with Waste or Water Containing Waste, subject to the conditions set out in Appendices I and III
 - 2.3 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 IV.
 - 2.4 Section 21(h) of the Act: Disposing in any manner of water which has been heated, subject to the conditions set out in Appendices I and IV.
 - 2.5 Section 21(i) of the Act: Altering the bed, banks course or characteristics of a watercourse, subject to the conditions set out in Appendices I and II.

B11270

3. Properties on which the use will be exercised and registered owners of the Properties.

Property Details	Registered Owner
Remaining portion of farm Groenfontein 331 JS	Anglo Operations Ltd
Portion 3 of farm Groenfontein 331 JS	Anglo Operations Ltd
Portion 2 of farm Groenfontein 331 JS	Anglo Operations Ltd
Portion 7 of farm Klippan 332 JS	Anglo Operations Ltd
Remaining portion of farm Klippan 332 JS	Anglo Operations Ltd
Portion 6 of farm Klippan 332 JS	Anglo Operations Ltd
Portion 11 of farm Klippan 332 JS	Anglo Operations Ltd
Remainder of portion 1 of the farm Klipfontein 322 JS	Anglo Operations Ltd
Remainder of portion 145 of the farm Klipfontein 322 JS	Anglo Operations Ltd
Portion 167 of the farm Klipfontein 322 JS	Anglo Operations Ltd
Remainder of portion 1 of farm Klipfontein 322 JS	Anglo Operations Ltd
Portion 49 of farm Naauwpoort 335 JS	Papenfus Francis Wheeler
Portion 51 of farm Naauwpoort 335 JS	Benella Beleggings CC

4. Licence and Review Period

- 4.1 This licence is valid for a period of twenty (20) year(s) from the date of issuance and it may be reviewed in an interval of not more than five (5) years.

5 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 Provincial Head" means Provincial Head: Mpumalanga, Department of Water and Sanitation, Private Bag X11259, Mbombela, 1200.

"Report" refers to the reports entitled Integrated Water Use Licence Application and Integrated Water and Waste Management Plan dated November 2016, Integrated Water Use Licence Application and Integrated Water and Waste Management Plan dated 8 June 2017, Geohydrological Report dated April 2011, Public Participation Report, Wetland Delineation and Assessment Report dated 26 September 2015, Civil Designs Drawings and Report as well as all other related documentations and communication (emails, letters, verbal, etc) thereto.

6. Brief description of the application

The applicant, Acwa Power Khanyisa Thermal Power Station (RF) Pty Ltd applied for an integrated water use licence in terms of section 21(c), 21(g), 21(h) and 21(i) of the National water Act, 1998 (Act 36 of 1998) for 5 km Bulk Water Supply Pipeline crossing Noupoot River and Hillslope wetland (6) and is within the 500m of Hillslope Seepage wetland (5); Road Re-Alignment crossing Hillslope Seepage Wetlands (1 & 6) and within 500m of Hillslope Seepage Wetland (5); Power Station crossing part of Hillslope Seepage wetland (1) and within 500m of Hillslope Seepage wetland (5); Dirty Stormwater Pond 7 within 500m of an Unchannelled Valley Bottom wetland; Dirty Stormwater Pond 8 within 500m of an Unchannelled Valley Bottom wetland; Ash Disposal Site within 500 m of pans and unchannelled valley bottom wetland; Khanyisa 400Kv substation within 250m of a Seepage wetland; Irrigation of garden with sewer effluent; Ash Disposal Facility; Evaporation Pond; Reclaimed Water Recovery Basin; Dirty Water Recovery Facility; Water/Steam Cycle Unit; Irrigation Water Recovery Pond; eleven (11) Dirty Stormwater Facilities; Septic Tanks at the Ash Disposal Area and Substation.

APPENDIX I

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 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.
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 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 Provincial 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 license and a report on the audit shall be submitted to the Provincial 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 Provincial Head or his representative upon request.
14. Any incident that causes or may cause water pollution shall be reported to the Provincial Head or his/her designated representative within 24 hours.

APPENDIX II

Section 21(c) of the Act: Impeding or diverting the flow of water in a watercourse;
Section 21(i) of the Act: Altering the bed, banks, course or characteristic of a watercourse

1. Construction, Operation and Maintenance

STORAGE OF WATER CONTAINING WASTE

1.1 This licence authorises the section 21(c) and (i) water uses as set out in Table 1:

Table 1: Section 21 (c) and (i) water use activities

Water use(s)	Purpose	Dimension	Property Description	Co-ordinates
Section 21 (c) & (i)				
5 km Bulk Water Supply Pipeline crossing Naauwpoort River and Hillslope wetland (6); and is within the 500m of Hillslope Seepage wetland (5).	To transport water from the eMalahleni Water Reclamation Plant	0.36 internal diameters.	Remaining portion of farm Groenfontein 331 JS. Portion 3 of farm Groenfontein 331 JS.	Start S 25°56'44.6" E 29°11'38.4" S 25°58'10.2" E 29°13'25.1"
Road Re-Alignment crossing Hillslope Seepage Wetlands (1 & 6) and within 500 m of Hillslope Seepage Wetland (5).	This road will be used as an access road.	Length: 525 m Width: 50 m	Remaining portion of farm Groenfontein 331 JS. Portion 2 of farm Groenfontein 331 JS.	S 25°58'34.92" E 29°13'15.64" S 25°58'5.67" E 29°13'23.2" S 25°57'47.67" E 29°14'22.22" S 25°58'29.48" E 29°13'6.67" S 25°58'42.65" E 29°13'14.72" S 25°58'42.40" E 29°13'2.70"

Water use(s)	Purpose	Dimension	Property Description	Co-ordinates
Section 21 (c) & (i)				
Ash Conveyor crossing Hillslope Seepage wetland (1) and within 500 m of unchannelled Valley Bottom (4).	The ash conveyor will transport ash from the Power Plant to the Ash Disposal Site.	Length of conveyor crossing wetland: 1.25 km	Remaining portion of farm Groenfontein 331 JS. Portion 2 of farm Groenfontein 331 JS.	S 26°00'19.2" E 29°12'54.4" S 25°58'1.0" E 29°13'10.8"
Power Station crossing part of Hillslope Seepage wetland (1) and within 500 m of Hillslope Seepage wetland (5).	A small section of the Power Plant footprint falls within the Hillslope seepage wetland.		Remaining portion of farm Groenfontein 331 JS. Portion 2 of farm Groenfontein 331 JS.	S 25°58'13.8" E 29°13'31.0"
Dirty Stormwater Pond 7 within 500 m of an Unchannelled Valley Bottom wetland.	To collect runoff from Ash Disposal Facility.		Portion 7 of farm Klippan 332 JS.	S 26°00'13.6" E 29°12'53.3"
Dirty Stormwater Pond 8 within 500 m of an Unchannelled Valley Bottom wetland.	To collect runoff from Ash Disposal Facility.		Portion 7 of farm Klippan 332 JS.	S 26°00'23.3" E 29°12'46.6"
Ash Disposal Site within 500 m of pans and unchannelled valley bottom wetland.	To dispose waste ash generated by the plant.	140 ha	Remaining portion of farm Klippan 332 JS. Portion 6 of farm Klippan 332 JS. Portion 7 of farm Klippan 332 JS. Portion 11 of farm Klippan 332 JS.	S 26°00'32.4" E 29°12'50.5"

Water use(s)	Purpose	Dimension	Property Description	Co-ordinates
Section 21 (c) & (i)				
Khanyisa 400 Kv substation within 250 m of a Seepage wetland.	To feed electricity generated by Khanyisa Power Station to the national grid.	Length 190 m	Portion 49 of farm Naauwpoort 335 JS. Portion 51 of farm Naauwpoort 335 JS.	S 25°57'42.1" E 29°14'46.4"

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

1.2.1 Report(s) submitted to the Department or the Responsible Authority;

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 The conveyor level at the watercourse crossing must be higher than the 1:100 year flood level.

1.4 The Licensee must submit a set of as-built drawings (not schematic layouts) to the Provincial Head of all river diversions, road crossings and weirs.

1.5 The conditions of the authorisation shall be brought to the attention of all persons (employees, sub-consultants, contractors etc.) associated with the undertaking of this activity and the applicant shall take such measures that are necessary to bind such persons to the conditions of this licence.

1.6 Construction activities must not take place within the 1:100 year flood-line or within a horizontal distance of 100 meters from any watercourse, estuary, borehole or well, whichever is the greatest, unless authorised by this licence (as part of the activities described in the report(s) (referred to in condition 1.2) submitted to the Department).

1.7 Compensation measures for damage to and or mitigation measures must be recommended if avoidance or minimisation of the impacts of the proposed development is not possible or if mitigation measures fail to adequately protect the in-stream and riparian habitat.

1.8 No material with pollution generating potential will be used in any construction activities.

1.9 The necessary erosion prevention mechanisms shall be employed to ensure the sustainability of all structures.

1.10 The Licensee must ensure that structures such as the river diversions, river road crossings, weirs and the culverts shall not be damaged excessively by floods exceeding the magnitude of floods occurring on average once in every 100 years.

1.11 The structure of temporary crossings must be non-erosive, structurally stable and must not induce any flooding or safety hazard. Temporary crossings 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.

- 1.12 Construction activities shall start up-stream and proceed into a down-stream direction, so that the recovery processes can start immediately, without further disturbance from upstream construction works.
- 1.13 Construction activities must be scheduled to take place during the dry seasons when flows are lowest.
- 1.14 The natural migration of aquatic biota and upstream movement of fish must not be disturbed.
- 1.15 The development may not impede natural drainage lines.
- 1.16 The construction camp shall not be located within the 1:100 year flood line or within 100
- 1.17 meters of any watercourse whatever the greatest.
- 1.18 Vehicles and other machinery must be serviced well above the 1:100 year flood line or within a horizontal distance of 100 meters from any watercourse or estuary. Oils and other potential pollutants must be disposed off at an appropriate licensed site, with the necessary agreement from the owner of such a site.
- 1.19 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 return the spilled material back into the system.
- 1.20 The system shall be maintained in a state of good repair and standby pumps must be provided.
- 1.21 Any hazardous substances must be handled according to the relevant legislation relating to transport, storage and use of the substance.
- 1.22 Pollutions caused by spills from the conveyances must be prevented through proper maintenance and effective protective measures especially near all stream crossings.
- 1.23 **Any access roads or temporary crossings should be:**
 - 1.20.1 non-erosive, structurally stable and should not induce any flooding or safety hazard;
 - 1.20.2 any damage be repaired immediately to prevent further damage.

2. Stormwater Management

- 2.1 Stormwater shall be diverted from the construction works and roads and shall be managed in such a manner as to disperse runoff and to prevent the concentration of stormwater flow.
- 2.2 Where necessary works must be constructed to attenuate the velocity of the stormwater discharge and to protect the banks of the watercourse.
- 2.3 Stormwater control works must be constructed, operated and maintained in a sustainable manner throughout the project.
- 2.4 Increased runoff due to vegetation clearance and/or soil compaction must be managed, and steps must be taken to ensure that stormwater does not lead to bank instability and excessive levels of silt entering the watercourse.

- 2.5 Stormwater 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. Water Quality and Quantity

- 3.1 The in-stream water quality must be analysed on weekly basis during the construction of the activities of the river diversion, at the monitoring points for both upstream and downstream of the activities for the river diversion for the following variables: pH, Electrical conductivity (mS/M), suspended solids (mg/l), and total dissolved solids (mg/l). Monitoring shall continue on monthly basis for three months after the cessation of the activities.
- 3.2 Activities (such as maintenance) that lead to elevated levels of turbidity of any watercourse must be minimised.
- 3.3 The Licensee shall ensure that the quantity of the water to downstream water users does not decrease because of the existence of the river, culverts and associated maintenance of road crossings.

4. General Specifications

- 4.1 A suitably qualified person, appointed by the Licensee, and approved, in writing, by the Provincial Head, must be responsible for ensuring that the structures are maintained in line with the design specifications.
- 4.2 The Licensee shall have a full time Civil Engineer Supervisor on the site during construction of river crossings and culverts. The contractor shall have an approved Site Agent on the site during construction.
- 4.3 The Licensee must ensure that river diversions, river road crossings, weirs and the culverts shall not be damaged excessively by floods exceeding the magnitude of floods occurring on average once in every 100 years.
- 4.4 Development activities should start upstream and work downstream, so that the recovery process can start immediately, without further disturbance from upstream disturbances.
- 4.5 The necessary erosion prevention mechanisms shall be employed to ensure the sustainability of all the structures.
- 4.6 Where temporary crossings are included their structure must be non-erosive, structurally stable and may not induce any flooding or safety hazard. Temporary crossings must be inspected regularly for accumulation of debris, blockage, erosion of abutments and overflow areas. Damaged areas shall be repaired and reinforced immediately.
- 4.7 The Licensee must submit a set of as-built detailed drawings (not schematic layouts) to the Provincial Head of all river crossings when required.

5. Protective Measures

- 5.1 The diversion structures may not restrict river flows by reducing the overall river width or obstructing river flow.
- 5.2 Operation and storage of equipment within the riparian zone must be limited as far as possible.
- 5.3 All activities within the riparian zone should be restricted as far as possible.
- 5.4 Any material removed from the in stream or riparian habitat, may not be stored within the riparian zone, and may not be stored in such a way that will cause damming of water or wash-away.
- 5.5 Alien vegetation must not be allowed to further colonise the area, and all new alien vegetation recruitment must be eradicated or controlled, using standard methods approved by the Department.
- 5.6 Soils that have become compacted through the activities of the development must be loosened to an appropriate depth to allow seed germination.
- 5.7 The proposed development must not impede the upstream movement of fish.
- 5.8 Increased runoff due to vegetation clearance and/or soil compaction must be managed and steps must be taken to ensure that stormwater does not lead to bank instability and excessive levels of silt entering the stream.
- 5.9 Riparian vegetation, including dead trees, may not be removed from the area. In particular, snags (fallen trees and branches) in the river must be protected (i.e. not collected for firewood or any other purpose).
- 5.10 All reasonable steps should be made to minimise noise and mechanical vibrations in the vicinity of the river.

6. Rehabilitation

- 6.1 All disturbed areas must be re-vegetated with an indigenous seed mix in consultation with an indigenous plant expert, ensuring that during rehabilitation only indigenous shrubs, trees and grasses are used in restoring the biodiversity.
- 6.2 The vegetation of the surrounding catchment should also be managed to prevent erosion and siltation of the water course.
- 6.3 The licensee shall take steps necessary to allow movement of aquatic species, including migratory species during the rehabilitation programme.
- 6.4 The licensee shall embark on a systematic long-term rehabilitation programme to restore natural watercourses to environmentally acceptable and sustainable conditions after construction, which shall include, but not be limited to:
 - 6.4.1 The rehabilitation of disturbed and degraded riparian areas to restore and upgrade the riparian habitat integrity to sustain a bio-diverse riparian ecosystem; and
 - 6.4.2 Annually assess the habitat to monitor the sustainability of the diversions and compliance with these conditions. Action must be taken to rectify any negative impacts.

- 6.5 The licensee shall ensure that the volume of flow is not reduced except for natural evaporative losses and the authorised attenuation volumes.
7. General Surface Water Design Requirements and Criteria
- 7.1 The licensee shall determine flood lines (1:50 and 1:100 year) prior to construction to ensure risks are adequately managed. Flood lines shall be clearly indicated on the layout plans.
- 7.2 The licensee shall schedule construction activities at or close to river crossings, streams or wetlands to take place during low flow periods.
- 7.3 The licensee shall clearly indicate all wetlands boundaries within the project area on layout plans.
- 7.4 Design and planning of all proposed construction activities adjacent to or in the vicinity of rivers, streams and wetlands shall consider the following measures:
- 7.4.1 Impact of alignment on springs and wetlands shall be investigated and monitored and ensure their continued functioning.
 - 7.4.2 Where appropriate, large individual indigenous riparian trees shall be avoided during construction and shall be clearly marked on site.
 - 7.4.3 All construction roads in or adjacent to the riparian zone shall be minimised and if required, shall be aligned and managed so as to minimise disturbance of the riparian zone and in-stream habitats.
- 7.5 The licensee shall do bio-monitoring to determine the impact, change, deterioration and improvement of the aquatic system associated with the activities that of impeding, altering or diverting the water resource.

APPENDIX III

Section 21(e) of the Act: Engaging in a Controlled Activity; Irrigation of any Land with Waste or Water Containing Waste

1. Quantity of Water Containing Waste for Irrigation

1.1 This licence authorises the disposal to irrigated land as set out in Table 2.

Table 2: Section 21 (e) water use

Water use(s)	Purpose	Capacity/ Volume (m ³ , tonnes and/or m ³ /annum)	Property Description
Section 21(e)			
Irrigation of garden with sewer effluent.	Irrigating garden with wastewater.	16 790 m ³ /annum	Remainder of portion 1 of the farm Klipfontein 322 JS. Remainder of portion 145 of the farm Klipfontein 322 JS. Portion 167 of the farm Klipfontein 322 JS. Remaining portion of the farm Groenfontein 331 JS.

1.2. The quantity of wastewater authorised to be irrigated in terms of this licence may not be exceeded without prior authorisation by the Minister.

2. Crop Type and Area Irrigated

2.1 This licence authorises to irrigate a total surface area of 23 ha of garden on the properties according to agreement.

3. Quality of Water Containing Waste

3.1 The quality of the water containing waste irrigated may not exceed the following non-exceedance values or range:

Table 3: Wastewater quality values:

Variable	Limit
pH	5,5-9.5
Electrical Conductivity	70-150 mS/m
Dissolved Organic Carbon	≤75 mg/l
Ammonia (as NH ₃ -N)	≤3 mg/l
Nitrates (as NO ₃ -N)	≤15 mg/l
Ortho-Phosphate (as PO ₄ -P)	≤10 mg/l
Faecal Coliform	≤1000 per 100ml

4. Monitoring

- 4.1. The quantity of water containing waste irrigated shall be metered and recorded daily.
- 4.2 Monitoring for the quantity of the water containing waste for irrigation shall be done at the point where the effluent is piped into the irrigation dam.
- 4.2 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 Provincial Head or his representative upon request.
- 4.3 The monitoring point/s shall not be changed without prior notification to and written approval by the Provincial Head.
- 4.5 A monitoring program to determine compliance with the ground water quality reserve on the property/properties must be designed in consultation with the affected parties.

5. Reporting

- 5.1 The information required in terms of condition 3 shall be submitted monthly to the Provincial Head, under reference 27/2/1/B611/2/1, within one month of the close of the period concerned.

6. Methods of Analysis

- 6.1 Analyses 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, Act 30 of 1982.
- 6.2 The methods of analysis shall not be changed without prior notification to and written approval by the Provincial Head.

7. General Irrigation Practices

- 7.1 Irrigation shall be practised in accordance with the guidelines prescribed in the document titled "*Guide: Permissible Utilisation and Disposal of Treated Sewage Effluent*", issued by the former Department of Health under reference 11/2/5/3 and dated 30 May 1978, or in accordance with any relevant regulations promulgated under section 26 of the Act.
- 7.2. Irrigation with waste shall be practised in a systematic manner and precautions shall be taken so as to prevent -
 - 7.2.1 water logging and pooling of waste in any location;
 - 7.2.2 pollution of underground water or surface water due to seepage or otherwise;
 - 7.2.3 fly breeding, public health hazard, odour or secondary pollution;
 - 7.2.4 runoff from the irrigation area because of wet weather or any other conditions whatsoever; and
 - 7.2.5 The site of the irrigation area shall be adequately fenced to prevent the entry of animals and unauthorised persons.
- 7.3 Notices manufactured of durable weatherproof material prohibiting unauthorised entry and warning against the use of water containing waste for drinking and washing purposes shall be displayed at prominent places along the fence and at entrance gates. Such notices shall be worded in the official languages applicable in the area.

8. Pipelines

- 8.1 The pipelines used for the conveyance of waste shall be painted in a conspicuous colour or manufactured of a coloured material distinctly different from the colour of the pipelines in which drinking water is flowing to avoid the possibility of any cross-connections of the different pipelines.
- 8.2 All stop-valves and taps on the pipelines conveying the effluent shall be of a type that can be opened and closed by means of a loose wrench. This wrench shall be in the safekeeping of a responsible member of the staff to prevent unauthorised use thereof.
- 8.3 Notices manufactured of a durable weatherproof material warning against the use of water containing waste for drinking and washing purposes shall be displayed at prominent places where the waste is being reused and at all taps. Such notices shall be worded in the official languages applicable in the area.

APPENDIX IV

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

Section 21(h) of the Act: Disposing in any manner of water which contain waste from, which has been heated

1. CONSTRUCTION AND OPERATION

- 1.1 The Licensee shall carry out and complete all the activities, including the construction and operation of the waste management facilities set out on Table 4, according to the Report and according to the final plans in the ACWA Power Khanyisa Thermal Power Station (RF) (Pty) Ltd Water Use Licence Application/ Integrated Water and Waste Management Plan as approved by the Provincial Head.
- 1.2 The construction of the facilities set out on Table 4 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.
- 1.3 The barrier system for the Ash Dump Facility must also include two layers of compacted clay (or equivalent) below the HDPE liner as per Regulation 636 requirement for a class C barrier.
- 1.4 The drainage pipes below the barrier system must comprise pipes of not less than 100m in diameter
- 1.5 The proposed Septic Tanks must be a water tight reinforced concrete structure or a prefabricated structure.
- 1.6 Drawings and or reports that are signed by a professional Civil Engineer and addressing the above requirements must be submitted to the Department for approval before implementation.
- 1.7 Within 30 days after the completion of the activities referred here in accordance with the relevant provisions of this licence, the Licensee shall in writing, under reference 27/2/1/B611/2/1, inform the Provincial Head thereof. This shall be accompanied by a signature of approval from the designer referred to above that the construction was done according to the design plans referred to in the Report.
- 1.8 The Licensee must ensure that the disposal of the water containing waste and the operation and maintenance of the system are done according to the provisions in the Report.
- 1.9 The Licensee shall as well submit a set of as-built drawings to the Provincial Head after the completion of the waste management facilities set out on Table 4.
- 1.9.1 The waste management facilities set out on Table 4 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.
- 1.10 The Licensee shall use acknowledged methods for sampling and the date, time and sampler must be indicated for each sample.

- 1.11 Flow metering devices shall be maintained in a sound state of repair and calibrated by a competent person at intervals of not more than once in two years. Calibration certificates shall be available for inspection by the Provincial Head or his representative upon request.

2. STORAGE OF WATER CONTAINING WASTE

- 2.1 The Licensee is authorised to dispose water containing waste as set out on Table 4.

Table 4: Disposal Facilities for water containing waste:

Water use(s)	Purpose	Capacity/ Volume (m ³ , tonnes and/or m ³ /annum)	Property Description	Co-ordinates
Section 21(g)				
Ash Disposal Facility.	To dispose waste ash generated by the plant.	140 ha 579 096.045 tons/annum.	Portion 7 of the farm Klippan 332 JS.	S 25°59'57.31" E 29°12'32.18"
Evaporation Pond.	To dispose the sludge that contains coal fines.	200 m ³	Portion 7 of farm Klippan 332 JS.	S 25°58'14.98" E 29°13'32.09"
Reclaimed Water Recovery Basin	To store industrial wastewater for purpose equalization and reuse.	300 m ³	Portion 7 of farm Klippan 332 JS.	S 25°58'14.98" E 29°13'32.09"
Dirty Water Recovery Facility.	To dispose dirty runoff from Plant areas. The dirty runoff is reused in the coal and ash desulfurization processes.	500 m ³	Portion 7 of farm Klippan 332 JS.	S 25°58'14.98" E 29°13'32.09"
Water/Steam Cycle Unit	Industrial effluent (potentially dust contaminated and oily water) from boiler area will be collected in the boiler dirty water collection facility, from where they will be transferred to the Dirty Water Recovery Pit.	250 m ³	Portion 7 of farm Klippan 332 JS.	S 25°58'14.98" E 29°13'32.09"
Irrigation Water Recovery Pond	To dispose sewer effluent.	200 m ³	Portion 7 of farm Klippan 332 JS.	S 25°58'14.98" E 29°13'32.09"

Water use(s)	Purpose	Capacity/ Volume (m ³ , tonnes and/or m ³ /annum)	Property Description	Co-ordinates
Section 21(g)				
Dirty Stormwater Facility 1.	To collect runoff from Ash Disposal Facility.	11 600 m ³	Portion 7 of farm Klippan 332 JS.	S 25°59'48.16" E 29°12'10.50"
Dirty Stormwater Facility 2.	To collect runoff from Ash Disposal Facility.	12 100 m ³	Portion 7 of farm Klippan 332 JS.	S 25°59'43.79" E 29°12'15.92"
Dirty Stormwater Facility 3.	To collect runoff from Ash Disposal Facility.	8 300 m ³	Portion 7 of farm Klippan 332 JS.	S 25°59'39.91 E 29°12'20.53"
Dirty Stormwater Facility 4.	To collect runoff from Ash Disposal Facility.	9 200 m ³	Portion 7 of farm Klippan 332 JS.	S 25°59'45.81" E 29°12'27.85"
Dirty Stormwater Facility 5.	To collect runoff from Ash Disposal Facility.	9 600 m ³	Portion 7 of farm Klippan 332 JS.	S 25°59'57.37" E 29°12'38.42"
Dirty Stormwater Facility 6.	To collect runoff from Ash Disposal Facility.	9 300 m ³	Portion 7 of farm Klippan 332 JS.	S 26° 0'3.49" E 29°12'44.48"
Dirty Stormwater Facility 7.	To collect runoff from Ash Disposal Facility.	12 900 m ³	Portion 7 of farm Klippan 332 JS.	S 26° 0'18.18" E 29°12'53.38"
Dirty Stormwater Facility 8.	To collect runoff from Ash Disposal Facility.	12 600 m ³	Portion 7 of farm Klippan 332 JS.	S 26° 0'24.11" E 29°12'45.78"
Dirty Stormwater Facility 9.	To collect runoff from Ash Disposal Facility.	13 100 m ³	Portion 7 of farm Klippan 332 JS.	S 26° 0'12.27" E 29°12'30.91"
Dirty Stormwater Facility 10.	To collect runoff from Ash Disposal Facility.	14 500 m ³	Portion 7 of farm Klippan 332 JS.	S 26° 0'7.44" E 29°12'26.10"
Dirty Stormwater Facility 11.	To collect runoff from Ash Disposal Facility.	13 100 m ³	Portion 7 of farm Klippan 332 JS.	S 26° 0'2.58" E 29°12'20.95"
Septic Tank at the Ash Disposal Area.	Disposal of sewer	19 m ³	Portion 7 of farm Klippan 332 JS.	S 25°59'54.29" E 29°12'23.85"
Septic Tank at the Substation.	Disposal of sewer	250 m ³	Portion 49 of farm Naauwpoort 335 JS. Portion 51 of farm Naauwpoort 335 JS.	S 25°59'54.29" E 29°12'23.85"

Water use(s)	Purpose	Capacity/ Volume (m ³ , tonnes and/or m ³ /annum)	Property Description	Co-ordinates
Section 21(h)				
Boiler wastewater cooling pond.	To dispose water from the boiler blow-down. The water will be mixed with cool water from Demineralized Water Production for it to be reused.	250 m ³	Remainder of portion 1 of farm Klipfontein 322 JS. Remainder of portion 145 of farm Klipfontein 322 JS. Portion 167 of farm Klipfontein 322 JS. Remaining portion of farm Groenfontein 331 JS.	S 25°58'14.98" E 29°13'32.09"

3. QUALITY OF WASTE WATER TO BE DISPOSED

- 3.1 The quality of water containing waste disposed of into the waste management facility mentioned on Table 4 shall not exceed the following limits:

Irrigation water recovery pit

Table 5

SUBSTANCE/PARAMETER	LIMIT
Faecal Coliforms (per 100 ml)	1000
Chemical Oxygen Demand (mg/l)	75
pH	5.5-9.5
Ammonia (ionised and un-ionised) as Nitrogen (mg/l)	2
Nitrate/Nitrite as Nitrogen (mg/l)	14
Chlorine as Free Chlorine (mg/l)	0.25
Suspended Solids (mg/l)	20
Electrical Conductivity (mS/m)	70 mS/m above intake to a maximum of 150mS/m
Ortho-Phosphate as phosphorous (mg/l)	8
Fluoride (mg/l)	0.8
Soap, oil or grease (mg/l)	2
Dissolved Arsenic (mg/l)	0.01
Dissolved Cadmium (mg/l)	0.005
Dissolved Chromium (VI) (mg/l)	0.04
Dissolved Copper (mg/l)	0.01
Dissolved Cyanide (mg/l)	0.01
Dissolved Iron (mg/l)	0.2
Dissolved Lead (mg/l)	0.01
Dissolved Manganese (mg/l)	0.08

Mercury and its compounds (mg/l)	0.004
Dissolved Selenium (mg/l)	0.01
Dissolved Zinc (mg/l)	0.08
Boron (mg/l)	0.8

Table 6: Water /steam cycle units

SUBSTANCE/PARAMETER	LIMIT
pH	6-9
Temperature	<30
Conductivity	<100
Total Suspended Solids (TSS)	<10
Total dissolved solids (TDS)	<450
Magnesium Hardness (Mg++)	<11.82
Total Hardness (Ca+Mg)	<146.5
Total Alkalinity (HCO ₃ +CO ₃)	<10
Sodium Chloride (NaCl)	<50.55
Total nitrogen	<5.0
Bicarbonate (HCO ₃ -)	0
Chloride (Cl-)	<24.43
Sulphate (SO ₄ --)	<190.6
Ammonia (NH ⁴⁺)	<10
Phosphate (PO ₄ ³⁻)	<3

Table 7: Evaporation pond

SUBSTANCE/PARAMETER	LIMIT
pH	6-9
Temperature	<30
Conductivity	<100
Total Suspended Solids (TSS)	<10 (sump) <4000 (backwash) <5 (brine) <300 (coal drains) <300 (limestone drains) <650 (rainwater)
Total dissolved solids (TDS)	<450 (sump); <200 (backwash), <1600 (brine) <120 (rainwater)
Magnesium Hardness (Mg ⁺⁺)	<11.82
Total Hardness (Ca+Mg)	<146.5
Total Alkalinity (HCO ₃ +CO ₃)	<10
Sodium Chloride (NaCl)	<50.55
Total nitrogen	<5.0
Chloride (Cl ⁻)	<150 (backwash) <1600 (brine)
Sulphate (SO ₄ ⁻⁻)	<190.6
Ammonia (NH ₄ ⁺)	<10
Phosphate (PO ₄ ³⁻)	<3
Aluminium (Al)	Traces
Antimony (Sb)	
Arsenic (As)	
Barium (Ba)	
Beryllium (Be)	
Boron (B)	
Cyanide (CN)	
Cadmium (Cd)	
Chromium (Cr)	
Cobalt (Co)	
Copper (Cu)	
Iron (Fe)	
Lead (Pb)	
Manganese (Mn)	
Mercury (Hg)	
Molybdenum (Mo)	
Nickel (Ni)	
Silver (Ag)	
Selenium (Se)	
Strontium (Sr)	
Thallium (Tl)	
Tin (Sn)	
Total Copper (Cu)	
Vanadium (V)	
Zinc (Zn)	

Table 8: Dirty water recovery Facility

SUBSTANCE/PARAMETER	LIMIT
pH	6-9
Temperature	<30
Conductivity	0
Total Suspended Solids (TSS)	<4000 (backwash) <5 (brine) <300 (coal drains) <300 (limestone drains) <650 (rainwater)
Total dissolved solids (TDS)	<200 (backwash), <1600 (brine) <120 (rainwater)
Magnesium Hardness (Mg++)	<11.82
Total Hardness (Ca+Mg)	<146.5
Total Alkalinity (HCO ₃ +CO ₃)	<10
Sodium Chloride (NaCl)	<50.55
Total nitrogen	<5.0
Chloride (Cl ⁻)	<150 (backwash) <1600 (brine)
Sulphate (SO ₄ --)	<190.6
Ammonia (NH ₄ ⁺)	<10
Phosphate (PO ₄ ³⁻)	<3
Aluminium (Al)	Traces
Antimony (Sb)	
Arsenic (As)	
Barium (Ba)	
Beryllium (Be)	
Boron (B)	
Cyanide (CN)	
Cadmium (Cd)	
Chromium (Cr)	
Cobalt (Co)	
Copper (Cu)	
Iron (Fe)	
Lead (Pb)	
Manganese (Mn)	
Mercury (Hg)	
Molybdenum (Mo)	
Nickel (Ni)	
Silver (Ag)	
Selenium (Se)	

Table 9: Reclaimed water Recovery

SUBSTANCE/PARAMETER	LIMIT
pH	6-9
Temperature	<30
Conductivity	0
Total Suspended Solids (TSS)	<4000 (backwash) <5 (brine) <300 (coal drains) <300 (limestone drains) <650 (rainwater)
Total dissolved solids (TDS)	<200 (backwash), <1600 (brine) <120 (rainwater)
Magnesium Hardness (Mg++)	<11.82
Total Hardness (Ca+Mg)	<146.5
Total Alkalinity (HCO ₃ +CO ₃)	<10
Sodium Chloride (NaCl)	<50.55
Total nitrogen	<5.0
Chloride (Cl-)	<150 (backwash) <1600 (brine)
Sulphate (SO ₄ --)	<190.6
Ammonia (NH ₄ ⁺)	<10
Phosphate (PO ₄ ³⁻)	<3
Aluminium (Al)	Traces
Antimony (Sb)	
Arsenic (As)	
Barium (Ba)	
Beryllium (Be)	
Boron (B)	
Cyanide (CN)	
Cadmium (Cd)	
Chromium (Cr)	
Cobalt (Co)	
Copper (Cu)	
Iron (Fe)	
Lead (Pb)	
Manganese (Mn)	
Mercury (Hg)	
Molybdenum (Mo)	
Nickel (Ni)	
Silver (Ag)	
Selenium (Se)	

Table 10: Reclaimed water Recovery

SUBSTANCE/PARAMETER	LIMIT
pH	6-9
Temperature	<30
Conductivity	0
Total Suspended Solids (TSS)	<4000 (backwash) <5 (brine) <300 (coal drains) <300 (limestone drains) <650 (rainwater)
Total dissolved solids (TDS)	<200 (backwash), <1600 (brine) <120 (rainwater)
Magnesium Hardness (Mg ⁺⁺)	<11.82
Total Hardness (Ca+Mg)	<146.5
Total Alkalinity (HCO ₃ +CO ₃)	<10
Sodium Chloride (NaCl)	<50.55
Total nitrogen	<5.0
Chloride (Cl ⁻)	<150 (backwash) <1600 (brine)
Sulphate (SO ₄ ⁻⁻)	<190.6
Ammonia (NH ₄ ⁺)	<10
Phosphate (PO ₄ ³⁻)	<3
Aluminium (Al)	Traces
Antimony (Sb)	
Arsenic (As)	
Barium (Ba)	
Beryllium (Be)	
Boron (B)	
Cyanide (CN)	
Cadmium (Cd)	
Chromium (Cr)	
Cobalt (Co)	
Copper (Cu)	
Iron (Fe)	
Lead (Pb)	
Manganese (Mn)	
Mercury (Hg)	
Molybdenum (Mo)	
Nickel (Ni)	
Silver (Ag)	
Selenium (Se)	

4. MONITORING

- 4.1 The Licensee shall monitor on monthly basis the water resources at surface water monitoring points and on quarterly basis at ground water monitoring points to determine the impact of the facility and other activities on the water quality by taking samples at the monitoring points to be established and monitoring points on Table 11 and Table 12.

Table 11: Surface water Quality Monitoring Points

Monitoring point ID	Description	Co-ordinates
MP1	50m Upstream Noupoot Stream	25°56' 28.982" S 29°12' 19.349" E
MP2	50m downstream Noupoot Stream	25°57' 2.516" S 29° 11' 16.346" E
MP3	Berry's Pan	25° 58' 49.404" S 29° 12' 24.336" E
MP4	Below 5 West Holding Dam	25° 59' 10.819" S 29° 12' 43.610" E
MP5	2A Dam	25° 59' 11.247" S 29° 13' 52.138" E
MP6	Unchanneled Valley Bottom Wetland	26° 0' 30.483" S 29° 13' 33.293" E
MP7	Recreated Watercourse	26° 0' 26.929" S 29° 12' 36.716" E
MP8	Recreated Watercourse	25° 59' 24.397" S 29°11' 27.974" E

Table 12: Ground water Quality Monitoring Points

Monitoring point ID	Owner	Co-ordinates
KKW42	Kleinkopje Colliery	S 25.96269 E 29.20405
KKW05	Kleinkopje Colliery	S 26.01289 E 29.21312
KKW13	Kleinkopje Colliery	S 25.99267 E 29.22051
KKW14	Kleinkopje Colliery	S 25.99684 E 29.22091
KKW42	Kleinkopje Colliery	S 25.97779 E 29.22099

- 4.2 The Licensee shall submit the description/purpose, coordinates in degrees, minutes and seconds for groundwater monitoring points mentioned on Table 12.
- 4.3 The monitoring boreholes upgradient and downgradient of the Ash Dump must be able to monitor for both the shallow and deep aquifers.

- 4.4 The surface water shall be monitored on monthly basis at the monitoring points indicated in Table 11 for the variables outlined in Tables 5, 6, 7, 8, 9 and 10.
- 4.5 The Groundwater quality shall be monitored on quarterly basis at the monitoring points indicated in Table 12 for the variables outlined in Table 13.

Table 13: Surface Water and Groundwater quality variables to be analysed:

Variable	Units
pH	pH units
Alkalinity	in mg/l
Nitrate	in mg/l
Electrical Conductivity	in mS/m
Aluminium	in mg/l
Ammonium	in mg/l
Cadmium	in mg/l
Calcium	in mg/l
Arsenic	in mg/l
Copper	in mg/l
Fluoride	in mg/l
Iron	in mg/l
Lead	in mg/l
Manganese	in mg/l
Potassium	in mg/l
Sulphate	in mg/l
Sodium	in mg/l
Arsenic	in mg/l
Zinc	in mg/l

- 4.6 The Licensee shall monitor stable isotopes on ad hoc basis.
- 4.7 The date, time and monitoring point in respect of each sample taken shall be recorded together with the results of the analysis.
- 4.8 Monitoring points shall not be changed prior to notification to and written approval by the Provincial Head.
- 4.9 The licensee shall participate in any initiative such as Direct Estimation of Ecological Effect Potential (DEEEP) to determine the toxicity of Ash Dump Facility. Both acute and chronic toxicity must be addressed and at least three taxonomic groups must be present when toxicity tests are performed.
- 4.10 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).
- 4.11 The methods of analysis shall not be changed without prior notification to and written approval by the Minister.

5. WATER RESOURCE PROTECTION

- 5.1 The impact of the activities of the Industry on the surface and ground water resource shall not exceed the water quality objectives to be determined by the Department for ACWA Power Khanyisa Thermal Power Station (RF) (Pty) Ltd.

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 co-operate with other water users in the catchment to determine the mass balance for the water resource reserve compliance point.
- 6.2 A copy of the duly licenced contractor who will empty the sludge from the Sewage Treatment Facility must be submitted to the Department before implementation.
- 6.3 The Licensee shall submit the results of analysis for the monitoring requirements to the Provincial Head on a quarterly basis under **Reference number 27/2/1/B611/2/1**.

7. STORM WATER MANAGEMENT

- 7.1 Stormwater 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.
- 7.2 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 stream.
- 7.3 Storm-water shall be diverted from the ACWA Power Khanyisa Thermal Power Station (RF) (Pty) Ltd complex site and roads and shall be managed in such a manner as to disperse runoff and concentrating the storm-water flow.
- 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 system shall 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/ Integrated Water and Waste Management Report.
- 7.9 The Licensee shall submit the updated Stormwater Management Plan to the Provincial Head within six (6) months of the issuance of this licence under Reference number 27/2/1/B611/2/1.

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 Water Containing Waste Facilities must be limited to authorised employees of the licensee and their Contractors only.
- 9.2 Notices prohibiting unauthorised persons from entering the areas referred to in condition 9.1, as well as internationally acceptable signs indicating the risks involved in case of an unauthorised entry must be displayed along the boundary fence of these areas.

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 Provincial 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 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.
- 10.3 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: –
 - 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 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 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 3 (three) months of the date this license was issued and a report on the audit shall be submitted to the Provincial Head within one month of finalisation of the report.

12. INTEGRATED WATER AND WASTE MANAGEMENT

- 12.1 The Licensee must prepare an *Integrated Water and Waste Management Plan (IWWMP)*, which must together with the *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.
- 12.2 The IWWMP and RSIP shall thereafter be updated and submitted to the Provincial 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 Provincial 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.

[END OF LICENCE]