water affairs
Department:
Water Affairs
REPUBLIC OF SOUTH AFRICA

Private Bag X313, Pretoria, 0001, Sedibeng Building, 185 Francis Baard Street, Pretoria, Tel: (012) 336-7500, Fax: (012) 326-4472/ (012) 326-2715

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

I, ***Trevor Balzer,*** in my capacity as Director General (Acting) in the Department of Water Affairs and acting under authority of the powers delegated to me by the Minister of Water and Environmental Affairs, hereby authorises the following water uses in respect of this licence:

SIGNED: Trevor Balzer

DATE: 22/11/2013

LICENCE NO: 04/B20F/ACFGI/2310
FILE NO: 16/2/7/B 200/K524

1. Licensee: **Anglo American Inyosi Coal (Pty) Ltd (Pty) Ltd: Phola-Kusile Coal Conveyor System**

Postal address: P.O. Box 61828
MARSHALLTOWN
2017

2. Water uses

2.1	Section 21(a) of the Act:	Taking of water from a water resource, subject to conditions set out in Appendices I and II.
2.2	Section 21(c) of the Act:	Impeding or diverting the flow of water in a watercourse, subject to conditions set out in Appendices I and III.
2.3	Section 21(f) of the Act:	Discharging of waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit, subject to conditions set out in Appendices I and IV.
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 I and V.
2.5	Section 21(i) of the Act:	Altering the bed, banks course or characteristics of a watercourse, subject to conditions set out in Appendices I and III.

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3. Properties on which the use will be exercised

No.	Section 21 of the Act	Property
3.1	Section 21 (a)	Remaining Extent Portion 4 Klipfontein 566 JR
		Remaining Extent Portion 1 Klipfontein 566 JR
		Portion 59 Klipfontein 566 JR
		Remaining Extent Farm Hartbeestfontein 537 JR
3.2	Section 21 (b)	Remaining Extent Farm Bankfontein 216 JR
		Portion 7 Bankfontein 216 JR
		Remaining Extent Portion 14 Klipfontein 568 JR
		Portion 13 Klipfontein 568 JR
		Portion 33 Klipfontein 568 JR
		Remaining Extent Farm Hartbeestfontein 537 JR
		Portion 58 Klipfontein 566 JR
		Portion 17/13 Klipfontein 566 JR
		Portion 13 Klipfontein 568 JR
3.3	Section 21 (c) & (i)	Remaining Extent Portion 2 Klipfontein 568 JR
		Remaining Extent Portion 1 Klipfontein 568 JR
		Portion 36 Klipfontein 568 JR
		Portion 66 Klipfontein 566 JR
		Portion 42 Klipfontein 566 JR
		Portion 6 Hartbeestfontein 537 JR
		Portion 58 Klipfontein 566 JR
		Remaining Extent Portion 12 Klipfontein 568 JR
		Portion 17/13 Klipfontein 566 JR
		Portion 6 Hartbeestfontein 537 JR
3.4	Section 21 (f)	Portion 17/13 Klipfontein 566 JR
3.5	Section 21 (g)	Remaining Extent Farm Bankfontein 216 IR
		Portion 7 Bankfontein 216 IR
		Remaining Extent Portion 14 Klipfontein 568 JR
		Portion 13 Klipfontein 568 JR
		Portion 33 Klipfontein 568 JR
		Remaining Extent Farm Hartbeestfontein 537 JR
		Portion 58 Hartbeestfontein 566 JR
		Remaining Extent Portion 1 Klipfontein 566 JR
		Portion 17/13 Klipfontein 566 JR
		Portion 13&14 Klipfontein 568 JR
		Portion 32 Klipfontein 568 JR

4. Registered owners of the Properties

Owner's Name	Farm Name and Portion Number	Title Deeds Numbers
Anglo American Inyosi Coal (Pty) Ltd	Remaining Extent Farm Hartbeestfontein 537 JR	T7192/2011
Eskom Holdings	Portion 6 Farm Hartbeestfontein 537 JR	T134593/2007
Eskom Holdings	Portion 7 Farm Hartbeestfontein 537 JR	T106356/2007
Anglo Operations Ltd	Portion 1 Remaining Extent Farm Klipfontein 566 JR	T7182/2011
Anglo Operations Ltd	Portion 4 Remaining Extent Farm	T7437/2009

	Klipfontein 566 JR	
Anglo Operations Ltd	Portion 17/13 Farm Klipfontein 566 JR	T7182/2011
Eskom Holdings Ltd	Portion 30 Farm Klipfontein 566 JR	T333888/2007
Eskom Holdings Ltd	Portion 42 Farm Klipfontein 566 JR	T333888/2007
Eskom Holdings Ltd	Portion 58 Farm Klipfontein 566JR	T11578/2008
Anglo Operation Ltd	Portion 59 Remaining Extent Farm Klipfontein 566 JR	T7182/2011
Anglo Operation Ltd	Portion 1 Farm Klipfontein 568 JR	T56650/2006
Anglo Operation Ltd	Portion 12 Remaining Extent Farm Klipfontein 568 JR	T7182/2011
Anglo Operation Ltd	Portion 13 Remaining Extent Farm Klipfontein 568 JR	T7182/2011
Anglo Operation Ltd	Portion 14 Remaining Extent Farm Klipfontein 568 JR	T7182/2011
Truter Boerdery Trust	Portion 32 Farm Klipfontein 568 JR	T13452/2009
Anglo American Inyosi Coal (Pty) Ltd	Portion 36 Farm Klipfontein 568 JR	T5781/2011
Truter Boerdery Trust	Portion 7 Farm Bankfontein 216 IR	T13322/1998
Truter Boerdery Trust	Remaining Extent Farm Bankfontein 216 IR	T13322/1998

5. Licence and Review Period

5.1 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.

6. Definitions

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

"The Regional Head" means Regional Chief Director: Mpumalanga, Department of Water Affairs, Private Bag X11259, NELSPRUIT, 1200.

"Report" refers to the report entitled Integrated Waste Water Management Plan and Risk Assessment report Dated September 2011for Anglo American Inyosi Coal: Phola-Kusile Conveyor System as compiled by Jones and Wagener as well as all other related documentations and communication (emails, letters, verbal, etc) related thereto.

7. Description of the activity

The Licensee, Anglo American Inyosi Coal (Pty) Ltd (Pty) Ltd: Phola-Kusile Conveyor System, applied for Integrated Water Use Licence in terms of section 21 (a) (Taking of water from water resources (629 100m^3/a) from 9 abstractions points), section 21(c) (Impeding and diverting the flow of water in a watercourse), section 21(f) (Discharging of waste or water containing waste into a water resource through a pipe (1 277 500 m^3/a)), section 21(g) (Disposing of waste in a manner which may detrimentally impact on a water resources, (1 466 960 m^3/a), section 21(i) (Altering the river beds, banks, course or characteristics of a

watercourse), of the National Water Act of 1998 (Act 36 of 1998) to undertake in the Anglo American Inyosi Coal (Pty) Ltd: Phola-Kusile Conveyor System on various properties, located within B20F and B20G of the Olifants Water Management Area.

APPENDIX I

General conditions for the licence

1. This licence is subject to all applicable provisions of the National Water Act, 1998 (Act 36 of 1998).

2. The responsibility for complying with the provisions of the licence is vested in the Licensee and not any other person or body.

3. The Licensee must immediately inform the Regional Head of any change of name, address, premises and/or legal status.

4. If the property\ies in respect of which this licence is issued is subdivided or consolidated, the Licensee must provide full details of all changes in respect of the properties to the Regional Head of the Department within 60 days of the said change taking place.

5. If a water user association is established in the area to manage the resource, membership of the Licensee to this association is compulsory. 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 Regional 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 Regional Head or his/her designated representative within 24 hours.

12. If the water use described in this licence is not exercised within 3 years of the date of the licence, the authorization will be withdrawn. Upon commencement of the water use, the Licensee must inform the relevant authority in writing.

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13. The Licensee must 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. The Department accepts no liability for any damage, loss or inconvenience of whatever nature, suffered as a result of/ amongst other things.

    14.1 Any force majeur event;
    14.2 Siltation of the river or dam basin and
    14.3 Required Reserve releases.

APPENDIX II

Section 21 (a) of the Act: Taking water from a water resource

1. Abstraction

1.1 This licence authorises Anglo American Inyosi Coal (Pty) Ltd (Pty) Ltd: Phola-Kusile Conveyor System for the abstraction of water in terms of Section 21(a) of the Act as set out in Table 1 below:

Table 1: Water Use Activity

Activity	Properties	Total Volume of Water (m^3/a)	Co-ordinates
Abstraction from old underground workings, this water will be treated in a water treatment plant. Abstraction will take place via 3 boreholes.	Klipfontein 566 JR, Portion 4 RE	144 000 Borehole 1	S 25º57'57.8" E 28º57'51.1"
	Klipfontein 566 JR, Portion 1 RE	144 000 Borehole 2	S 25º57'33.8" E 28º57'14.1"
	Klipfontein 566 JR, Portion 1 RE	144 000 Borehole 3	S 25º58'09.9" E 28º56'43.9"
Abstraction of water from 3 farm dams for construction purposes.	Hartbeestfontein 537 JR, RE	58 400 DAM 1	S 25º54'52.8" E 28º57'36.6"
		58 400 DAM2	S 25º54'51.1" E 28º57'00.5"
	Klipfontein 566 JR, Portion 59	58 400 DAM3	S 25º56'15.8" E 28º56'43.2"
Abstraction of water from a spring for potable use	Hartbeestfontein 537 JR, RE	21 900	S 25º54'52.8" E 28º57'36.6"

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

1.3 This licence does not imply any guarantee that the said quantities and qualities of water will be available at present or at any time in the future.

1.4 The above mentioned volume may be reduced when the licence is reviewed.

1.5 The Licensee shall continually investigate new and emerging technologies and put into practice water efficient devices or apply technique for the efficient use of water containing waste, in an endeavour to conserve water at all times.

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1.6 The Licensee shall be responsible for any water use charges or levies, which may be imposed from time to time by the Department or Regional Head in terms of the Department's Raw Water Pricing Strategy.

1.7 The Department accepts no liability for any damage, loss or inconvenience, of whatever nature, suffered as a result of:

1.7.1 shortage of water;
1.7.2 inundations or flood;
1.7.3 siltation of the resource and
1.7.4 required reserve releases.

1.8 The Licensee must install appropriate water measuring devices to measure the volume of water abstracted. The Licensee must ensure that all measuring devices are properly maintained and in good working order and must be easily accessible. This shall include a programme of checking, calibration, and/or renewal of measuring devices. All water taken from the resource shall be measured, recorded and reported as follows:

1.8.1 The daily quantity of water taken must be metered or grouped and the total recorded at the last day of each month and
1.8.2 The Licensee shall keep record of all water measurements taken and a copy of the records shall be forwarded to the Regional Head on or before 25 January and 25 July of each year.

1.9 No water taken may be used for purposes other than intended in this Licence, without written approval by the Regional Head or his/her delegated nominee.

1.10 Notices prohibiting unauthorised persons from entering the certain areas, 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.

1.11 The Licensee must establish a programme of formal Information Management System, which maintains a database on water supply, distribution and delivery infrastructure.

2. SITE SPECIFIC CONDITIONS

2.1 This licence supersedes the General Authorisation from Government Notice no. 399 which was confirmed by the Mpumalanga Regional Head dated 18 June 2012.

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 Anglo American Inyosi Coal (Pty) Ltd: Phola-Kusile Conveyor System for the watercourse crossings in terms of section 21 (c) and (i) of the Act as set out in Table 2 and in the water use licence application reports submitted to the Department or the Regional Head (refer to condition 1.2 Appendix III) for:

Table 2: Water Use Activities

Activity	Properties	Height (m)	Width (m)	Length (m)	Co-ordinates
Phola-Kusile Conveyor watercourse crossing 1: crossing of a wetland	Klipfontein 568 JR, Portion 2 RE	2.2	16	66	S 26º00'51.4" E 28º56'40.3"
Phola-Kusile Conveyor watercourse crossing 2: crossing an unnamed tributary of Wilge River	Klipfontein 568 JR, Portion 1RE	2.2	16	66	S 26º00'42.7" E 28º56'14.8"
Phola-Kusile Conveyor watercourse crossing 3: crossing wetland associated with Holfonteinspruit	Klipfontein 568 JR, Portion 36	2.2	16	271	S 26º00'02.4" E 28º55'25.9"
Phola-Kusile Conveyor watercourse crossing 4: crossing Klipfonteinspruit	Klipfontein 566 JR, Portion 66	2.2	16	140	S 25º58'15.8" E 28º55'14.1"
Phola-Kusile Conveyor watercourse crossing 5: crossing Klipfonteinspruit	Klipfontein 566 JR, Portion 42	2.2	16	140	S 25º56'59.5" E 28º55'57.4"
Phola-Kusile Conveyor watercourse crossing 7: crossing a wetland	Klipfontein 566 JR, Portion 58	0.5	4	40	S 25º55'42.5" E 28º55'47.6"
Service Road 1 crossing: Crossing a wetland associated with Saalklapspruit	Klipfontein 568 JR, Portion 12 RE	0.5	4	66	S 26º00'42.7" E 28º56'14.8"
Service Road 2 crossing: Crossing unnamed tributary of Wilge River	Klipfontein 568 JR, Portion 1RE	0.5	4	499	S 26º00'42.7" E 28º56'14.8"

Activity	Properties	Height (m)	Width (m)	Length (m)	Co-ordinates
Service Road 3 crossing: crossing a wetland associated with Holfonteinspruit	Klipfontein 568 JR, Portion 36	0.5	4	271	S 26º00'02.4" E 28º55'25.9"
Service Road 4 crossing: Crossing Klipfonteinspruit	Klipfontein 568 JR, Portion 36	0.5	4	140	S 25º58'15.8" E 28º55'14.1"
Service Road 5 crossing: Crossing Klipfonteinspruit	Klipfontein 566 JR, Portion 17/13	0.5	4	140	S 25º57'01.5" E 28º56'09.4"
Service Road 7 crossing: Crossing a wetland	Klipfontein 566 JR, Portion 58	0.5	4	40	S 25º55'42.5" E 28º55'47.6"
Mobile treatment plant treated water release point, which may have an impact on the river bed	Klipfontein 566 JR, portion 17/13				S 25º56'29.2" E 28º56'10.4"

1.2 The Licensee shall carry out and complete all activities listed under condition 1.1 according to the following:

1.2.1 Reports submitted to the Department, specifically:

1.2.1.1 Integrated Waste Water Management Plan and Risk Assessment report by Jones and Wagener dated September 2011;
1.2.1.2 Wetland Basic Assessment Report by Wetland Consulting Services dated April 2007 and
1.2.1.3 Final Environmental Impact Assessment report and Environmental Management Programme by Synergistics dated February 2012.

1.2.2 Environmental Authorisation; dated 26 July 2012.

1.2.2.1 Conditions of this licence and
1.2.2.2 Any other written direction issued by the Regional 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 and the Licensee must take such measures that are necessary to bind such persons to the conditions of this licence.

1.5 A copy of the water use licence and reports set out under condition 1.2 Appendix III must be on site at all times.

1.6 A suitably qualified person(s), appointed by the Licensee, and approved in writing by the Regional Head; 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

2.1 For water use activities in Table 2:

2.1.1 Work method statements, site plan(s) and detailed design drawings for the construction of all infrastructures of impeding and/or diverting flow of watercourses must be submitted to the Regional Head for a written approval before construction and implemented as directed. The foregoing must indicate the regulated activities, marking the limits of disturbance in relation to the impacted watercourse(s); morphology of the watercourse(s); site specific impacts; and environmental management, particularly erosion and sediment, controls and measures;

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

2.1.3 No site activities must occur beyond the proposed site location of the erosion and sedimentation controls and marked limits of disturbance and

2.1.4 Revised master plan incorporating the 1:100 year floodline, riparian zones, buffer zones, all affected water courses, wetlands, borrow-pits, bridges and stormwater infrastructure must be submitted to the Regional Head before commencement of the activities.

2.2 An Environmental Management Plan and rehabilitation plan for the decommissioning of any of the water use activities listed in Table 2 must be submitted five (5) years before commencing with closure to the Regional Head for a written approval.

2.3 For all the activities listed under condition 1.1, Table 2, "as-built" plan(s) and engineering drawing(s) prepared by a registered professional engineer, must be submitted to the Regional Head within six (6) months of completion of new activities and for existing water uses within six (6) months of the date of issuance of this licence. These plan(s) and drawing(s) must indicate the watercourse(s) including wetland boundaries and layout and structure location(s) of all infrastructure of impeding and/or diverting flow of watercourses as well as alterations to watercourse(s) on the property(ies).

3. PROTECTIVE MEASURES

3.1 Stormwater Management

3.1.1 Stormwater management practices must be constructed, operated and maintained in a sustainable manner throughout the project and for the water use activities set out in condition 1.1 Appendix III 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 stormwater does not lead to bank instability and excessive levels of silt entering the watercourse(s);

3.1.1.2 Stormwater must be diverted from the Phola-Kusile Conveyor System and must be managed in such a manner as to disperse runoff and to prevent the concentration of stormwater flow;

3.1.1.3 The velocity of stormwater discharges must be attenuated and the banks of the watercourses protected;

3.1.1.4 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 and

3.1.1.5 Drainage next to the construction works and mining area must be diverted away from the watercourse(s) to ensure that any contaminated runoff does not flow directly into the watercourse(s) as a stormwater discharge.

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 Construction camp, plant and material stockpiles must be located outside the extent of the watercourse(s) and must be recovered and removed one (1) month after construction has been completed.

3.2.7 During construction erosion berms shall be installed to prevent gully formation, according to the slope.

3.2.8 All areas affected by construction shall be rehabilitated upon completion of the construction phase of the development. Areas shall 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 in this licence.

3.3 Water Quality

3.3.1 The Licensee shall sample the water quality weekly (during construction) and monthly (during operation) for the mentioned variables (Table 3) at the monitoring points both upstream and downstream of the activities and report to the Regional Head within thirty (30) days after the results of each sampling event is receive

Table 3: Water quality parameters relevant for sampling

Variable	Limit
Flow (ℓ/s)	Not applicable
Temperature (ºC)	<10% variation
pH	6.0 – 8.5
Electrical conductivity (EC) (mS/m)	<50
Suspended solids (SS) (mg/ℓ)	<25
Dissolved oxygen (mg/ℓ)	≥6
Turbidity (NTU)	<3
Sechi disk depth (m)	≥1 meter
Alkalinity (mg $CaCO_3$/ℓ)	<100

The variables may be amended on discretion of the Regional Head. Only an accredited (SANS 17025) laboratory to be used for analysis.

3.3.2 Monitoring must continue for three (3) years after the cessation of the activities listed in condition 1.1 Appendix III.

3.3.3 Monitoring must be undertaken as set out in section 5 Appendix III.

3.3.4 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 dry seasons when flows are low.

3.3.5 The Licensee must ensure that the quality of the water to downstream water users does not decrease because of the water use activities listed under condition 1.1 Appendix III.

3.3.6 A qualified person must be appointed to assess the quality of water both upstream and downstream of the activities prior to commencement of construction.

3.3.7 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.

3.3.8 Vehicles and other machinery must be serviced well above the 1:100 year floodline or delineated riparian habitat, whichever is the greatest. 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.

3.3.9 Any hazardous substances must be handled according to the relevant legislation relating to transport, storage and use of the substance.

3.3.10 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 must be maintained in a state of good repair and standby pumps must be provided.

3.3.11 The Licensee has to indicate to the Regional Head within sixty (60) days after issuance of this licence, the strategic placement of bio-swale, bio-filters, silt, litter and hydrocarbon (oil) traps to minimise the risk of pollutants entering the natural drainage system of the area.

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 The activities must be conducted in a manner that does not negatively affect catchment yield, hydrology and hydraulics. 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 of the watercourse i.e. through placement of structures/supports and to minimise turbulent flow in the watercourse.

3.4.4 Structures must be designed in a way to prevent the damming of stream/river water and not impact the flow of water, during the construction and operational phases of all developments.

3.4.5 The development may not impede natural drainage lines.

3.4.6 The diversion structures may not restrict river flows by reducing the overall river width or obstructing river flow.

3.4.7 Bank filling must restore the channel shape and bed level to pre-construction condition.

3.4.8 Where flow in watercourse is permanent, the trench must be staged across part of the channel to maintain flows. Flows must not be stopped.

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 or delineated riparian habitat, whichever is the greatest unless authorised in this licence.

3.5.3 Activities must not occur in sensitive riffle habitats.

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 vegetation basal cover of at least 15% at all times.

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 All reasonable steps must be taken to minimize noise and mechanical vibrations in the vicinity of the watercourses.

3.5.12 Necessary erosion prevention mechanisms must be employed to ensure the sustainability of all structures and activities and to prevent instream sedimentation.

3.5.13 Soils that have become compacted through the water use activities must be loosened to an appropriate depth to allow seed germination.

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3.5.14 Slope/bank stabilisation measures must be implemented with a 1:3 ratio or flatter and vegetated with indigenous vegetation immediately after the shaping.

3.5.15 Stockpiling of removed soil and sand must be stored outside of the 1:100 flood line or delineated riparian habitat, whichever is the greater, to prevent being washed into the river and must be covered to prevent wind and rain erosion.

3.5.16 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.

3.5.17 The overall macro-channel structures and mosaic of cobbles and gravels must be maintained 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.

3.5.18 As much indigenous vegetation growth as possible shall be promoted within the proposed development area in order to protect soil and to reduce the percentage of the surface area which is paved.

3.5.19 Run-off from paved surfaces shall be slowed down by the strategic placement of berms.

3.5.20 Adequate measures must be implemented to prevent instream siltation during the construction phase.

3.5.21 Unless authorised by this licence, access roads must not encroach into the extent of the watercourse(s).

3.6 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.

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 in consultation with an indigenous plant expert, 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 Rehabilitation must be concurrent with construction.

4.5 Topsoil must be stripped and redistributed.

4.6 Compacted and disturbed areas must be shaped to natural forms and to follow the original contour. In general cut and fill slopes and other disturbed areas must not exceed 1:3 (v: h) ratio, it must be protected, vegetated, ripped and scarified parallel with the contour.

4.7 The Regional Head must sign a release form indicating that rehabilitation was done satisfactory according to specifications as per this licence.

4.8 A photographic record must be kept as follows and submitted with reports as set out in section 5 Appendix III:

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, seasonally.

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 Regional Head for a written approval within one (1) month from the date of issuance of this licence.

4.11 The original contours must be established over the pipeline or bridge or road. After the backfill has subsided, the contour must follow the surrounding contours to stop irregular flows or blockage of biotic movement.

4.12 A Wetland Management and Rehabilitation Plan must be compiled by a wetland specialist when wetlands are affected and submitted to the Regional Head for a written approval.

4.13 Wetland crossing(s) must be visited by a wetland specialist prior to construction to determine baseline conditions. This shall be repeated during and after

rehabilitation measures have been implemented to assess the success of rehabilitation and erosion control measures.

5. MONITORING AND REPORTING

5.1 The Regional Head must be notified in writing one week prior to commencement of the licensed activity (ies) and again upon completion of the activity(ies)

5.2 A comprehensive and appropriate environmental assessment and monitoring programme (including bio-monitoring) to determine the impact, change, deterioration and improvement of the aquatic system associated with the activities listed under condition 1.1 Appendix III as well as compliance to these water use licence conditions must be developed and submitted to the Regional Head for a written approval before commencement and must subsequently be implemented as directed.

5.3 Six (6) monthly monitoring reports must be submitted to the Regional Head until otherwise agreed in writing with the Regional Head.

5.4 A qualified and responsible scientist must be retained by the Licensee who must give effect to the various licence conditions and to ensure compliance thereof pertaining to all activities of impeding and/or diverting flow of watercourses as well as alterations to watercourses on the property (ies) as set out in condition 1.1 Appendix III.

5.5 The Licensee must conduct an internal audit on compliance with the conditions in this licence. A report on the audit must be submitted to the Regional Head within one (1) month of the finalisation of the audit. A qualified independent auditor must undertake this audit.

5.6 The audit reports must include but are not limited to:

5.6.1 Reporting in respect of the monitoring programme referred to in condition 5.2 Appendix III;
5.6.2 A record of implementation of all mitigation measures including a record of corrective actions and
5.6.3 Compensation measures for damage where mitigation measures have failed to adequately protect the in-stream and riparian habitat or any other characteristic of the watercourses.

5.7 The Licensee must apply in writing to the Regional Head for alternative reporting arrangements for which written approval must be provided.

5.8 An Environmental Management/Monitoring Committee (EMC) must be established consisting of, but not limited to, representatives of the Licensee, the Responsible Person(s) for ensuring compliance with this licence, the Department of Water Affairs, the relevant Department of Environmental Affairs, the Department of Minerals and Resources, and other stakeholders.

5.9 The EMC must in addition to monitoring compliance with the conditions of the Environmental Management Programme Report, monitor for the duration of its establishment compliance with the conditions of this water use licence.

5.10 A wetland specialist must be appointed to monitor the compliance to the wetland management and rehabilitation plan and conditions in this licence pertaining to impacts on wetlands and provide specialist advise for corrective actions and compile audit reports which must be submitted to the Regional Head.

6. OTHER WATER USERS

6.1 The Licensee must attempt to 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 compensative measures.

7. POLLUTION PREVENTION, INCIDENTS AND MALFUNCTIONS

7.1 Pollution incidents must be dealt with in accordance with the Act.

7.2 Any incident that may cause pollution of any water resource must immediately be reported to the Regional 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 Regional 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 Regional 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 Regional Head may at any stage of the process request proof of budgetary provisions for rehabilitation and closure of project.

9. SITE SPECIFIC CONDITIONS

9.1 The Mitigation measures listed in the EMP and MDEDET Environmental Authorisation and specialist reports must be implemented.

9.2 Conveyor transfer stations, wetlands and river ecological status or condition, surface or subsurface drains, discharge points (waste water and stormwater) crossing designs to be strictly monitored and proof of monitoring should be provided and directives to be issued if engineering solutions and Garth Batchelor, EMP inputs and specifications do not work satisfactorily as determined by independent ECO.

9.3 Proof of success of dust control must be provided.

9.4 Position of vehicle, pedestrian, livestock crossing should be indicated.

9.5 Clarity should be provided regarding the material fencing that will be used to support migration of smaller species.

9.6 Silt traps and evaporation dams must be cleaned out as often as required.

9.7 Clean stormwater must be directed around bunded areas and other dirty areas.

9.8 Sub-surface drains must be placed at all high risk or sensitive areas.

9.9 Water quality in sub-surface drains must be monitored to verify that seepage into the environment is not occurring.

9.10 Leakage detection sumps must be monitored weekly to verify whether or not leakage rates are exceeded.

9.11 ECO must conduct visual observations of dust generation and to direct movement of water tankers based on visual observations.

9.12 Landscape Design Plans as discussed under the EMP heading Aesthetics or Housekeeping and Visual Impacts must be submitted in relation to watercourse for approval and for proof of rehabilitation.

9.13 Plant Species Plans in relation to watercourse crossings must be submitted as part of proof of rehabilitation as addition to the EMP.

9.14 Proof of alien and invasive eradication and sites identified should be submitted.

9.15 Before and after photos should be taken and submitted as proof of rehabilitation and maintenance management.

9.16 Detail specification of fencing to be used should be submitted at watercourse migration areas.

9.17 Details of bio monitoring as proposed by aquatic specialist must be submitted for approval.

9.18 Details of the system of fines and final list of prohibited activities should be submitted for approval in relation to watercourses.

9.19 Work areas and watercourses with their boundaries, buffers should be demarcated on site.

9.20 No go areas should be demarcated with temporary fencing and indicated in relation to watercourses.

APPENDIX IV

Section 21 (f) of the Act: Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit.

1. QUANTITY OF WATER CONTAINING WASTE

1.1 This licence authorises the discharge to an unnamed tributary of the Klipfonteinspruit of a maximum quantity of one million two hundred and seventy seven thousand five hundred cubic metres (1 277 500 m^3/a) of treated mine water per annum.

1.2 The quantity of treated water containing waste authorised to be disposed of in terms of this licence may not be exceeded without authorisation to do so.

2. QUALITY OF WATER CONTAINING WASTE

2.1 The quality of treated water containing waste discharged into unnamed tributary of the Klipfonteinspruit may not exceed the following non-exceedance values or range:

Table 4: Discharge Limits into the Klipfonteinspruit

Substance/parameter	Limit
Ph	7.0
Calcium (mg/l)	7.0
Chloride (mg/l)	>20
Fluoride (mg/l)	0.5
Iron (mg/l)	>1.0
Magnesium (mg/l)	20
Manganese (mg/l)	0.18
Potassium(mg/l)	0.0
Sodium (mg/l)	20
Sulphate(mg/l)	60
Total dissolved solids (mg/l)	280

3. MONITORING

3.1 Quantity

3.1.1 The quantity of waste discharged into the unnamed tributary of the Klipfonteinspruit shall be metered and recorded daily.

3.1.2 Monitoring for the quantity of waste shall be done at the point where the waste is discharged into the unnamed tributary of the Klipfonteinspruit.

3.1.3 Flow metering, recording and integrating devices shall be maintained in a sound state of repair and calibrated by a competent person at intervals of not more than

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

3.2 Quality of waste

3.2.1. The quality of the waste shall be monitored by taking grab samples every week at the monitoring points described in condition 4.2 Appendix IV. Each sample shall be analysed according to condition 6 for the following variables:

pH	
EC	in mS/m
Calcium (as Ca)	in mg/l
Fluoride (as F)	in mg/l
Iron (as Fe)	in mg/l
Magnessiue (as Mg)	in mg/l
Manganese	in mg/l
Potassium (K)	in mg/l
Sodium (as Na)	in mg/l
Sulphate (SO_4)	in mg/l
Total dissolved solids	in mg/l
Suspended solids	in mgl/l

and/or any other variable as may be required from time to time by the Regional Head.

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

4. MONITORING POINTS

4.1 Monitoring for quality and flow shall only be carried out at the monitoring points listed below:

4.1.1 Monitoring points for flow at the waste discharge point;
4.1.2 Monitoring points for quality at the outlet point where the waste is discharged into the unnamed tributary of the Klipfonteinspruit and
4.1.3 In the unnamed tributary of the Klipfonteinspruit at points upstream and downstream of the discharge point at monitoring points identified in consultation and approved by the Regional Head.

4.2 The monitoring points shall not be changed without prior notification to and written approval by the Regional Head.

5. METHODS OF ANALYSIS

5.1 Analyses shall be carried out in accordance with methods prescribed by and obtainable from the South African Bureau of Standards, in terms of the Standards Act, (Act 32 of 1982.).

5.2 The methods of analysis shall not be changed without prior notification to and written approval by the Minister or delegated nominee.

6. REPORTING

6.1 The information required in terms of condition 4 Appendix IV shall be submitted monthly to the Regional Head, under reference 16/2/7/B200/K524, within one month of the close of the period concerned.

APPENDIX V

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

1. STORAGE OF WATER CONTAINING WASTE

1.1 The Licensee is authorised to dispose of a maximum quantity in cubic metres (m^3) of waste per year (annum) into the waste management facility on the properties, as set out in Table 5 and 6 below:

Table 5: Waste Management Facilities

Facility	Waste Description	Properties	Operational Storage Capacity (m^3/a)	Co-ordinates
Coal transfer Station Evaporation dam 1	Capture dirty runoff as a result of dust suppression from transfer station footprint area	Bankfontein 216 IR, RE	300	S26º03'16.6" E28º59'52.5"
Coal transfer Station Evaporation dam 2		Bankfontein 216 IR, Portion 7	250	S26º01'53.4" E28º59'46.6"
Coal transfer Station Evaporation dam 3		Klipfontein 568 JR, Portion 14 RE	140	S26º01'08.3" E28º57'31.2"
Coal transfer Station Evaporation dam 4		Klipfontein 568 JR, Portion 13	320	S26º00'56.3" E28º57'32.5"
Coal transfer Station Evaporation dam 5		Klipfontein 568 JR, Portion 33	90	S25º58'52.1" E28º54'46.0"
Coal transfer Station Evaporation dam 6		Hartbeestfontein 537 JR, RE	270	S25º55'25.7" E28º56'29.9"
Coal transfer Station Evaporation dam 7		Hartbeestfontein 566 JR, Portion 58	400	S25º55'53.2" E28º55'43.6"
Brine disposal facility	Storage of the brine that will be generated during the treatment process	Klipfontein 566 JR, Portion 17/13	5 Ml or 5000m^3/a	S25º56'31.7" E28º56'15.7"
Gypsum waste storage facility	Storage of the Gypsum cake that will be generated during the treatment process	Klipfontein 566 JR, Portion 17/13	7 300 tons	S25º56'33.1" E28º56'11.2"

Table 6: Waste Management Facilities

Facility	Waste Description	Volume (m^3/a)	Property Name	Coordinates
Pre treatment storage facility	Decant water stored before it is sent to the mobile treatment plant	1 277 500	Klipfontein 566 JR, Portion 1 RE	S25º57'23.9" E28º57'03.8"

1.2 The quantity of water containing waste authorised to be disposed of in terms of this licence may not be exceeded without authorisation to do so.

Table 7: Dust suppression with dirty water

Waste Description	Volume (m^3/a)	Property Name	Coordinates
Dust suppression on each of the transfer stations namely: • Coal transfer Station Evaporation dam 1 • Coal transfer Station Evaporation dam 2 • Coal transfer Station Evaporation dam 3 • Coal transfer Station Evaporation dam 4 • Coal transfer Station Evaporation dam 5 • Coal transfer Station Evaporation dam 6 • Coal transfer Station Evaporation dam 7	26 072 26 072 26 072 26 072 26 072 26 072 26 072 **Total: 182 504**	Bankfontein 216 IR, Portion RE Bankfontein 216 IR, Portion 7 Klipfontein 568 JR, RE portion 14 Klipfontein 568 JR, portion 13 Klipfontein 568 JR, Portion 33 Hartbeestfontein 537 JR, RE Hartbeestfontein 566 JR, Portion 58	S26º03'16.6" E28º59'52.5" S26º01'53.4" E28º59'46.6" S26º01'08.3" E28º57'31.2" S26º00'56.3" E28º57'32.5" S25º58'52.1" E28º54'46.0" S25º55'25.7" E28º56'29.9" S25º55'53.2" E28º55'43.6"
Dust Suppression using treated water from the sewage treatment	1 960	Hartbeestfontein 537 JR, Portion 6 and RE; Klipfontein 568 JR, Portion 13, 14 and 32; Bankfontein 216 IR, RE and Portion 7	S26º03'16.6" E28º59'52.5" S26º01'53.4" E28º59'46.6" S26º01'08.3" E28º57'31.2" S26º00'56.3" E28º57'32.5" S25º58'52.1" E28º54'46.0" S25º55'25.7" E28º56'29.9"

1.3 No excessive dust suppression that leads to saturated conditions should be done and no dust suppression during wet or rainy periods.

1.4 An annual soil chemistry map must be compiled and submitted, with a report, to the Regional Head. The soil chemistry map shall cover the areas covered by the

dust suppression and map concentrations of pH, Electrical Conductivity and Sodium. This map has to be interpreted by a professional soil scientist and recommendations and conclusions to be included in a report.

2. CONSTRUCTION, OPERATION AND MAINTANANCE

2.1 All facilities constructed to manage clean and dirty stormwater, seepage and or process water shall be constructed as per the proposed designs reflected in the reports.

2.2 The process dam systems must be operated under appropriate supervision and maintained in such a manner as to ensure that:

2.2.1 Wave action created by wind does not erode the inner sides of the pond walls;

2.2.2 A minimum freeboard of 0.8 metres be maintained for the mine residue facility to return water dam above the expected maximum water level which is based on the average monthly rainfall figure for the catchment area concerned, plus the maximum precipitation to be expected over a period of 24 hours with a frequency of once in every 50 years, less the gross mean evaporation for the area and

2.2.3 If, in the opinion of the Regional Head, the brine ponds fail to meet the requirements of this licence or otherwise constitutes a water pollution hazard, the Licensee must take such appropriate steps as may be deemed necessary by the Regional Head.

2.3 Contour walls or furrows must be provided around the process dam system to prevent stormwater ingress or erosion of the evaporation pond walls and any wastewater from entering any river or stream.

2.4 The construction, operation and maintenance of all dam facilities classified as a dam with a safety risk, shall be carried out under supervision of a Professional Civil Engineer, registered under the Engineering Profession of South Africa Act, 1990 (Act 114 of 1990).

2.5 The Operating Manual of the dam facilities shall include a water management plan that describes capacity and operating methods for the components of the water management system such as the minimum freeboard.

2.6 The relevant components of the water management system, of which the dam facilities are an integral part, shall be designed to retain the run-off for a 24-hour duration storm event with a 50 year recurrence interval maintaining a minimum freeboard of 0.8 metres. The capacity shall be over and above the operating capacity.

2.7 The Licensee shall manage and operate the facility in accordance with the design plans and specifications. Notwithstanding these specifications, the operator of the facility shall advise the professional person on any circumstances or aspect of the facility or present a risk to the public or the environment.

2.8 The construction and operation of the brine ponds shall be carried out under 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.

2.9 The Licensee shall implement the following erosion protection measures:

2.9.1 The slopes of the brine ponds and berms shall be vegetated as soon as practically possible with appropriate seed mix.
2.9.2 All disturbed areas shall be vegetated as soon as practically possible with appropriate vegetation. Areas that fail to establish vegetation cover must be re-seeded immediately.
2.9.3 Where disturbed areas cannot be vegetated during the life operations of the dam, erosion control measures shall be implemented on all slopes exceeding 2% and engineered control measures on all slopes exceeding 15%.
2.9.4 Alien vegetation shall not be allowed to colonise the area and all new alien vegetation recruitment must be eradicated or controlled, suing standard methods approved by the Department.
2.9.5 Loose sack gabions (biodegradable sacks filled with soil and *Cynodon dactylon* seed) shall be placed within and/or around eroded areas.
2.9.6 The erosion zone shall be backfilled and seeded with appropriate seed mix, which will predominantly consist of creeping grasses.

2.10 The Licensee shall provide a detailed stormwater management plan for brine ponds. The stormwater management plan shall include details of the following:

2.10.1 Separation of clean and dirty water runoff and
2.10.2 Surface water control measures.

2.11 Groundwater monitoring programme shall include water level monitoring, rainfall records, tailings deposition data, and hydrochemistry.

2.12 The hydrochemistry shall include: pH, electrical conductivity, total dissolved solids, calcium, magnesium, sodium, potassium, silica, chloride, total alkalinity, sulphate, nitrate, fluoride, iron, manganese, copper, and zinc.

2.13 The Operating Manual of the mine residue facility shall include a water management plan that describes capacity and operating methods for the components of the water management system which will include the minimum freeboard, the closest acceptable distance of pool from perimeter and the decant arrangements.

2.14 The Licensee shall establish a brine ponds management system appropriate for the size, complexity and safety classification of the residue disposal facility. The management system shall include a policy, setting of objectives and targets, an organisational structure, the definition of duties and responsibilities, the setting of procedures and methods, training, performance monitoring, reporting and response mechanism, emergency preparedness plans, management review procedures and auditing of the tailings.

2.15 The Licensee shall manage and operate the facility in accordance with the design plans and specifications. Notwithstanding these specifications, the operator of the facility shall advise the professional person on any circumstances or aspect of the facility that, according to his operating experience, might either endanger the integrity of the disposal facility or present a risk to the public or the environment.

3. QUALITY OF WASTE WATER TO BE DISPOSED INTO WASTE WATER FACILITIES:

3.1 The groundwater quality of the monitoring boreholes downstream and upstream of the waste water containment facilities shall not exceed the following limits as set out in Table 8 below:

Table 8: Wastewater limits into wastewater facilities

Substance/parameter	Limit
pH	7.7
Calcium (mg/l)	568
Chloride (mg/l)	3.7
Fluoride (mg/l)	0.8
Iron (mg/l)	0.13
Magnesium (mg/l)	196
Manganese (mg/l)	2.4
Potassium(mg/l)	0.0
Sodium (mg/l)	32
Sulphate(mg/l)	2130
Total dissolved solids (mg/l)	3309

4. MONITORING

4.1 Monitoring of Treated Water

4.1.1 The Licensee shall monitor the water quality of the treated water continuously with online water quality monitoring of the key variables as set out in Table 8.

4.2 Surface Water Quality Monitoring

4.2.1 The Licensee shall submit within one month of the date of issuance of licence, a surface water quality monitoring programme, with the GPS co-ordinates and the criteria used in the selection of the water monitoring points.

4.2.2 The Licensee shall further submit within one month of the date of issuance of this licence the GPS co-ordinates of the point of discharge of water containing wastes into the water resource.

4.2.3 The following variables (constituents) shall be included in the surface monitoring programme:

pH	
Electrical Conductivity (EC)	mS/m
Total Dissolved Solids (TDS)	mg/l
Suspended Solids (SS)	mg/l
Total Alkalinity	mg/l
Total Hardness	mg/l
Nitrates (NO3)	mg/l
Chloride (Cl)	mg/l
Fluoride (F)	mg/l
Iron (Fe)	mg/l
Zinc (Zn)	mg/l
Manganese (Mn)	mg/l
Aluminium (Al)	mg/l
Sodium (Na)	mg/l
Magnesium (Mg)	mg/l
Calcium (Ca)	mg/l
Potassium (K)	mg/l
Sulphate (SO4)	mg/l

4.2.4 The location of additional monitoring points, which may from time to time be specified by the Regional Head, shall be communicated in writing to the Licensee and this communication shall be regarded as part of the licence.

4.3 Groundwater Quality Monitoring

4.3.1 The Licensee shall submit within one month of the date of issuance of this licence, a ground water quality monitoring programme which must provide the detailed criteria followed in the establishment of the groundwater monitoring point as set out in Table 9.

Table 9: Groundwater monitoring points

DESCRIPTION	LONGITUDE	LATITUDE
DG – F6	28°59'03.90" E	25°54'06.98" S
DG – F8	28°58'43.29" E	25°54'18.15" S
HN – F2	28°57'36.61" E	25°54'52.85" S
KF - 3	28°55'33.60" E	25°59'59.60" S
KF – F2	28°57'19.57" E	26°01'13.54" S
KFH – 1	28°57'31.72" E	26°02'55.67" S
KFH – 9	28°57'26.32" E	26°02'07.37" S
KN – 27	28°57'50.27" E	25°58'03.93" S
KN – 29	28°56'09.53" E	25°56'14.25" S
KN – 30	28°56'10.75" E	25°56'09.68" S
KN – 34	28°55'49.62" E	25°57'26.36" S
KN - 36	28°55'36.41" E	25°57'19.92" S
KN – 46	28°55'56.25" E	25°56'40.46" S
KN – 48	28°55'24.85" E	25°56'52.23" S
KN – 51	28°55'54.37" E	25°57'06.42" S

4.3.2 Samples from the relevant boreholes of the different sites, where the groundwater in the boreholes are at expected higher hydraulic pressure levels than the hydraulic pressure levels in the groundwater under the sites, shall be considered as background monitoring.

4.3.3 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.

4.3.4 The Licensee shall maintain groundwater quality monitoring network to the satisfaction of the Regional Head, so that unobstructed sampling, as required in terms of this licence, can be undertaken.

4.3.5 The groundwater monitoring programme shall include water level monitoring, rainfall records, and hydrochemistry. The hydrochemistry shall include: pH, electrical conductivity, total dissolved solids, calcium, magnesium, sodium, potassium, silica, chloride, sulphate, nitrate, fluoride, iron, manganese, copper and zinc.

4.3.6 Groundwater monitoring points shall be selected to measure: Groundwater impacts (quality and levels) associated with the coal conveyor system activities.

4.3.7 The Licensee shall monitor the impact of activities along geological structures that may act as preferential pathways for contaminant transport.

4.3.8 The Licensee shall monitor the direct impacts associated with the disposal of waste.

4.3.9 The Licensee shall monitor the impact of the activities on downstream groundwater users at the monitoring points;

4.3.10 The Licensee shall provide a list of all groundwater-monitoring points within the coal conveyor system properties. This list shall include the following:

4.3.10.1 Borehole reference;
4.3.10.2 Description of the area where they are situated (location);
4.3.10.3 Co-ordinates;
4.3.10.4 Monitoring frequency and
4.3.10.5 Variables analysed.

4.3.11 The frequency of sampling shall not be changed prior to notification and written approval by the Regional Head.

4.3.12 The Licensee shall use acknowledged methods for borehole sampling and the date, time, sampler and borehole number must be indicated for each sample.

4.3.13 The Licensee shall make provision for the sampling of any additional monitoring requirements that might be required from time to time as specified by the Regional Head.

4.3.14 No groundwater abstraction may take place within 100m of river, spring or wetland. This distance may be increased by Regional Office if deemed necessary.

4.3.15 Water level need to be monitored to ensure that groundwater component of the Reserve is not impacted negatively.

4.3.16 Appropriate groundwater monitoring needs to be designed to monitor any adverse impacts on the groundwater resources.

4.3.17 Future licence applications in this area should be referred to the Regional Head: Water Ecosystems to verify the applicability of the level of Reserve determination in relation to the specific licence application.

4.3.18 Due to the low confidence of this Reserve determination, the results should not be used to evaluate medium to high impact water use activities.

4.4 Investigative Monitoring

4.4.1 If, in the opinion of the Regional 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.

4.5 Bio-monitoring Programme

4.5.1 Bio-monitoring shall be performed within the surface water resource to determine ecological integrity of the Klipfonteinspruit on an ongoing basis.

4.5.2 The sampling points shall be determined by an aquatic specialist.

4.5.3 Ecological measures to be used for the biological monitoring programme as follows:

4.5.3.1 Aquatic macro-invertebrates must be sampled using the latest SASS (South African Scoring System) method;
4.5.3.2 Fish Assemblages Integrity (FAII);
4.5.3.4 Riparian and Aquatic Vegetation Assessment and
4.5.3.5 Whole Effluent Toxicity (WET) Tests.

4.5.4 Any variable, frequency of monitoring or additional monitoring points as may be required from time to time by the Regional Head, shall be adhered to.

5. REPORTING

5.1 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.

5.2 The Licensee shall submit the results of analysis for the monitoring requirements to the Regional Head on a quarterly basis under Reference number 16/2/7/B200/K524

5.3 The Licensee shall submit the nature and the quality of the waste disposed into the following dams:

5.3.1 Brine facility;
5.3.2 Gypsum facility and
5.3.3 Pre treatment storage facilities.

6. STORMWATER MANAGEMENT

6.1 All runoff water (stormwater) arising as a result of precipitation must be:

6.1.1 On land adjacent to the waste disposal sites and
6.1.2 On the mine residue facility, shall be prevented from coming into contact with any substance, whether such substance is a solid, liquid, vapour or gas, or combination thereof, which is produced, stored dumped or spilled on the premises, including leachate.

6.2 All stormwater shall be diverted and drained around the brine ponds and from the working face of the brine ponds, by means of works constructed by the Licensee.

6.3 Runoff may not be discharged to a watercourse and/or the environment unless it complies with the quality requirements as may from time to time be determined by the Regional Head, but must be diverted to and contained in works constructed by the Licensee.

6.4 Runoff water which comply to the quality requirements as may from time to time be determined by the Regional Head, will be regarded as uncontaminated runoff water and must be diverted away from the waste disposal sites to the environment and discharged into a watercourse at a point downstream of the waste disposal sites after verification of compliance by the Regional Head.

6.5 Runoff water which does not comply with the quality requirements as may from time to time be determined by the Regional Head, may not be discharged to a watercourse or the environment, but must be regarded as contaminated runoff and must be collected and contained in facilities constructed from where it must be dealt with accordingly.

6.6 In the event that runoff water becomes contaminated with seepage or as a result of the operational activities on the premises of the Licensee to the extent of not complying with water quality requirements as may from time to time be determined by the Regional Head; the Licensee must:

6.6.1 Submit information regarding the quality of the water must be supplied to the Regional Head and

6.6.2 This water must be contained on the brine pond sites in facilities constructed for this purpose, until the Regional Head has informed the Licensee otherwise.

6.7 All seepage produced by the brine ponds, must be collected in subsoil and surface seepage interception drains and containment works.

6.8 No seepage or contaminated runoff water may be discharged to a watercourse or environment.

7. ACCESS CONTROL

7.1 The Licensee must ensure effective access control on the mine residue facility to reasonably prevent entry of domestic animals, game and unauthorised persons during the period of construction for closure.

7.2 Notices prohibiting unauthorised persons from entering the mine residue facility, as well as an internationally accepted sign indicating the risks involved in unauthorised entry must be displayed at suitable intervals along the boundary fence of the solid waste disposal site.

7.3 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.

7.3.1 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.

8. CONTINGENCIES

8.1 Accurate and up-to-date records shall be kept of all system malfunctions resulting in non-compliance with the requirements of this licence. The records shall be available for inspection by the Regional Head upon request. Such malfunctions shall be tabulated under the following headings with a full explanation of all the contributory circumstances:

8.1.1 Operating errors;
8.1.2 Mechanical failures (including design, installation or maintenance);
8.1.3 Environmental factors (e.g. flood);
8.1.4 Loss of supply services (e.g. power failure) and
8.1.5 Other causes.

8.2 The Licensee must, within 24 hours, notify the Regional Head of the occurrence or potential occurrence of any incident which has the potential to cause, or has caused water pollution, pollution of the environment, health risks or which is a contravention of the licence conditions.

8.3 The Licensee must, within 14 days, or a shorter period of time, as specified by the Regional Head, from the occurrence or detection of any incident

referred above, submit an action plan, which must include a detailed time schedule, to the satisfaction of the Regional Head of measures taken to:

8.3.1 Correct the impacts resulting from the incident
8.3.2 Prevent the incident from causing any further impacts and
8.3.3 Prevent a recurrence of a similar incident.

9. AUDITING

9.1 The Licensee shall conduct an annual internal audit on compliance with the conditions of this licence. A report on the audit shall be submitted to the Regional Head within one month of finalisation of the report, and shall be made available to an external auditor shall the need arise.

9.2 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 Regional Head within one month of finalisation of the report.

10. INTEGRATED WATER AND WASTE MANAGEMENT

10.1 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 Regional Head for approval within one (1) year from the date of issuance of this licence.

10.2 The IWWMP and RSIP shall thereafter be updated and submitted to the Regional Head for approval, annually.

10.3 The Licensee must, at least 180 days prior to the intended closure of any facility, or any portion thereof, notify the Regional Head of such intention and submit any final amendments to the IWWMP and RSIP as well as a final *Closure Plan,* for approval.

10.4 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.

11. SITE SPECIFIC CONDITIONS

11.1 The proposed groundwater management plan in terms of quality and quantity must be implemented and ensure that there are monitoring boreholes around the proposed conveyor route, evaporation dams and all other disposal facilities.

11.2 All effluent containment facilities must be lined in an effort to minimize the seepage of poor quality leachate into the groundwater resources.

11.3 During the operational phase the Licensee must ensure local aquifers are not artificially recharged by the seepage emanating from the disposal facilities, dirty water dams, or any hazardous waste storage facilities.

11.4 Emergency action plans in cases of groundwater polluted emanating from these water use activity such as coal spill, disposal facilities, dirty water dams or any hazardous waste storage facilities (e.g. oil and diesel spills), should be adhered to protect groundwater quality from degradation and a plan for remediation must be developed and ensure that corrective measures implemented are adequate. This action plan should inter alia identify the sources of potential groundwater contamination, the potential impacts should be quantified and their contribution factored into the remedial strategy of groundwater.

11.5 The effects of unmanaged and uncontrolled continuous dewatering of aquifers must be monitored properly including the collection of water levels and groundwater abstraction volumes on a monthly basis.

11.6 Evaporation dams and disposal facilities are major possible pollution sources for groundwater if not managed properly. Early warning systems as well as controls must be in place to minimize the impacts of pollution and to allow timely control of contamination incidents.

11.7 Conveyor transfer stations must also be operated and maintained effectively to prevent any coal spillage.

11.8 Groundwater quality must also be monitored on a quarterly basis by taking water samples to accredited laboratory for analysis and check the quality trends over extended periods of abstraction. This will assist in determining whether the boreholes are contaminated or meet the minimum required standard.

11.9 The monitoring data must be analysed by a hydrogeologist to establish quality trends for the boreholes. This can be used to re-evaluate the aquifer quantity and quality status on an ongoing basis and recommendation adjustment to abstraction rate or daily pump cycle if required.

11.10 The effluent must meet the minimum legal discharge standards before is discharged to water resources and ensure surface streams do not act as secondary sources of contamination.

11.11 Evaporation dams and all waste disposal facilities should be managed properly to avoid decant of poor quality water into the surface resources and ensure surface streams do not act as secondary sources of contamination during operational, decommission and closure phases.

11.12 It is recommended that the regulatory controls pertaining to the site must be enforced more stringently.

12. SPECIAL CONDITIONS FOR THE BRINE PONDS AND GYPSUM STORAGE FACILITY

12.1 For the Gypsum Waste Storage Facility the Licensee should ensure that the design incorporate the following:

12.1.1 The waste water containment facility should be lined by a concrete 200 mm thick slab with a 30 MPa concrete;
12.1.2 A 8 geotextile as protection, geo-linear beneath should be used including the 1.5 mm HDPE geo-membrane on top of geo-liner;
12.1.3 Stress cracking must be added and increase the joints to between 7 and 12m centres and
12.1.4 The Licensee should consider the 50/50 OPC blend as it will reduce shrinkage.

12.2 For the Brine Disposal Facility the Licensee should ensure that the design incorporate the following:

12.2.1 The waste water containment facility should have a 300 mm in-situ base preparation and a secondary composite layer should be clay or geosynthetic clay line (GCL);
12.2.2 A 1.5 mm HDPE geo-membrane and cuspate drainage sheet of CAVIDRAIN or similar should be used;
12.2.3 The Licensee should ensure that the 3 800 g/m^2 geosynthetic clay line (GCL) and 1.5 mm HDPE geo-membrane is used and
12.2.4 Leakage detection should be installed to detect spillages.

END OF LICENCE