DRAFT AMENDMENT MOTIVATION REPORT

PROPOSED AMENDMENT OF AN EXEMPTION AUTHORISATION FOR ASH DISPOSAL FACILITY AT KENDAL POWER STATION IN MPUMALANGA

DEA Ref Number: 14/12/16/3/3/3/63AM1

Green Gold Ref: GGG19/30

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ABBREVIATIONS

ADF	Ash Disposal Facility
BID	Background Information Document
BSc	Bachelor of Sciences
DEA	Department of Environmental Affairs
DEFF	Department of Environment, Forest and Fisheries
EA	Environmental Authorisation
EAP	Environmental assessment Practitioner
EIA	Environmental impact assessment
EIR	Environmental Impact Report
IEIA	Integrated Environmental Impact Assessment
IEA	Integrated Environmental Authorisation
I&AP	Interested and Affected Parties
MBA	Master's in Business Administration
MSc	Masters in Science
MW	Megawatt
NEMA	National Environmental Management Act (Act 107 of 1998 as amended)
PPP	Public Participation Process

1. INTRODUCTION

1.1. BACKGROUND

Kendal Power Station (Kendal) is a coal-fired station, owned and operated by Eskom Holdings SOC Ltd (Eskom). Upon its completion in 1993, Kendal became the world's largest dry- cooled power station, designed to generate approximately 4000 MV. It has an indirect dry-cooling system that uses a cooling tower and water. Cooling water (clean water) flowing through these elements, cools down as the cold air passes over them and returns to the condenser. This is referred to as a closed system as there is no loss of water due to evaporation and uses significantly less water in its cooling processes than conventional wet cooled power stations. Currently the power station has six (6) 686 megawatt (MW) units that generate 4 116 MW of energy.

Initially Kendal was designed to have an operating life of 40 years. In line with the planned operating life of the power station, its initial Ash Disposal Facility (ADF) was designed to have sufficient capacity to dispose the ash that is generated during the 40-year period, with an eight (8) -year contingency period. Following the completion of the design and construction of the Kendal ADF, the power station's operating life was extended to 60 years including a 5-year contingency period up until 2058.

Due to this extension of the operating life, the disposal capacity of the initial ADF will no longer accommodate the volume of ash that will be generated over the 60-year operating life plus the 5-year contingency period.

Eskom received an Integrated Environmental Authorisation (IEA) for the extension of their ADF to the northern and westerly direction, in July 2015. One of the conditions of the IEA was that the new ADF; otherwise known as the Continuous ADF, should be lined with Class C lining. Eskom applied for a transition period exemption to dispose on a portion of the approved area without lining, while the construction of the lined ADF is underway. The exemption application was approved in May 2016, granting Eskom permission to dispose without lining until 05 May 2020.

Details of the IEA that was granted as well as the Exemption Authorisation are provided in **Table 1** below. A copy of each is provided in **Appendix A1** and **A2** respectively.

Table 1:Authorisations granted

Authorisation Description	Reference Number	Date Issue
Integrated Environmental Authorisation: Continuous Disposal of Ash at the Existing Ash Disposal Facilities at Kendal Power Station, Mpumalanga Province	14/12/16/3/3/3/63	28th of July 2015
Exemption Authorisation: Continuous Disposal of Ash at the Existing Ash Disposal Facilities Without a Class C liner.	14/12/16/3/3/3/63AM1	5th of May 2016.

Due to procurement delays, the construction of the lined Continuous ADF has not commenced. Furthermore, the exemption footprint has not been fully covered with ash, resulting in the operation philosophy of ashing to be impractical to allow a void or unused footprint in order to utilize the newly lined footprint in the ADF area.

Eskom is therefore seeking permission from the Department of Environment, Forestry and Fisheries (DEFF) to extend the Exemption Authorisation period by continuing to ash on the existing exempted footprint until it reaches its full capacity.

The proposed changes to the Exemption Authorisation may result in significant impacts to the environment. Therefore, a Part 2 amendment is required in terms of the EIA Regulations, 2014.

Green Gold Group (Pty) Ltd (Green Gold) has been appointed by Eskom to undertake the required amendment application processes in terms of the National Environmental Management Act (NEMA) and the Environmental Impact Assessment (EIA) Regulations, 2014 as amended.

1.2. PROPOSED AMENDMENT TO EXEMPTION AUTHORISATION

It is envisaged that the authorised exemption period will lapse before the exemption area reaches its full ashing capacity and prior the construction completion of the liner on the ADF area. Eskom proposes to amend the Exemption Authorisation by replacing the four-year time constraint that was stipulated, with the remaining footprint of the exemption area.

LIDAR survey dated 9 Jan 2019 shows that 31Ha of the exemption area was used at the time of survey. With assuming the same load factors till end of exemption period May 2020, by

extrapolation, Kendal would have used 48Ha by May 2020, which leaves Kendal with 35Ha of unused exemption area, as in **Table 2** below and **Appendix A3**. Eskom proposes to continue to dispose ash on the exempted footprint until it reaches its full capacity.

Table 2: ADF Footprint

Original Exemption Footprint (Ha)	Used Exemption Footprint (Ha)	Remaining Exemption Footprint as of end of exemption period from May 2020 (Ha)
83	48	35

1.3. PROJECT AREA SUBJECT TO AMENDMENT APPLICATION

Kendal continuous ADF is located within the Kendal Power Station. The regional settings of the proposed area are stipulated in the table below and depicted in the locality map (Appendix 1).

Table 3:Regional settings of the Kendal Power Station ADF

ASPECT	DETAIL
Province	Mpumalanga Province
Regional authority	Nkangala District Municipality
Local authority	Emalahleni Local Municipalities
Local Municipal Ward Number	Ward 30
Farms on which the activities take place	Schoongezicht 218 IR Portions:
SG 21 Digit Code	T0IR00000000021800000
Amendment footprint (Remaining exempted area)	52 hectares
Coordinates	26° 5'56.02"S, 28°56'13.86"E.
Nearest towns	Phola and Ogies

ASPECT	DETAIL
Surrounding communities	Various formal and informal community groupings – land owners, land occupiers, informal and formal settlements
Use of land immediately adjacent to mine	residential, mining and farming.
Water catchment and management area	Olifants River Catchment (Primary Catchment B) – Quaternary Catchment B20E

2. DETAILS OF THE EAP

Table 4:Details of the EAP

Name:	Lebohang Moiloa
Qualifications:	1. MBA: Business Management 2. MSc: Geography (Waste Management) 3. BSc Hons: Geography (Environmental Management) 4. BSc: Physics and Geography
Professional Affiliations	1. Professional Natural Scientist (Pr.Sci.Nat.). Reg. No. 400146/08 2. International Association for Impact Assessment (IAIAsa). Reg.No. 1624 3. Institute of Waste Management Southern Africa. Reg No. 10113105
Experience	Seventeen (17) years of experience in environmental management, covering the following: • Integrated waste management planning • Environmental impact assessment • Feasibility studies • Waste licensing

The curriculum vitae (CV) of the EAP is attached as **Appendix C**

3. LEGISLATIVE REQUIREMENTS

3.1. AMENDMENT PROCESS REQUIREMENTS

In terms of Regulations 31 and 32 of the NEMA, EIA Regulations of 2014, as amended in 2017, Eskom intends to apply for a substantive amendment to the Exemption Authorisation issued.

Regulation 31 (Part 2) of the 2014 NEMA EIA Regulations states:

"An environmental authorisation may be amended by following the process prescribed in this Part if the amendment will result in a change to the scope of a valid environmental authorisation where such change will result in an increased level or nature of impact where such level or nature of impact was not;

(a) assessed and included in the initial application for environmental authorisation; or

(b) taken into consideration in the initial environmental authorisation; and the change does not, on its own, constitute a listed or specified activity."

The proposed application for the amendment of the four-year exemption period, to be replaced with the remaining 35-hectare footprint capacity, may result in an increased level or nature of impact to the environment.

Regulation 32 of the EIA Regulations states the following:

"*The applicant must within 90 days of receipt by the competent authority of the application made in terms of regulation 31, submit to the competent authority- (a) report, reflecting- (i) an assessment of all impacts related to the proposed change; (ii) advantages and disadvantages associated with the proposed change; (iii) measures to ensure avoidance, management and mitigation of impacts associated with such proposed change; and (iv) any changes to the EMPr;*

which report- (aa) had been subjected to a public participation process, which had been agreed to by the competent authority, and which was appropriate to bring the proposed change to the attention of potential and registered interested and affected parties, including organs of state, which have jurisdiction in respect of any aspect of the relevant activity, and the competent

authority, and (bb) reflects the incorporation of comments received, including any comments of the competent authority".

As per Regulation 32, this report will reflect the above-mentioned characteristics and will be subjected to a 30-day public participation period as required by the law.

4. DETAILS OF THE PUBLIC PARTICIPATION PROCESS

4.1. OBJECTIVES OF THE PUBLIC PARTICIPATION PROCESS

The Public Participations Process (PPP) is an integral part of the amendment process, to inform and involve interested and affected parties. The PPP is designed to achieve the following objectives:

- To ensure that Interested and Affected Parties (I&APs) are well-informed about the proposed amendment and the processes to be followed;
- To provide I&APs sufficient opportunity to engage and provide inputs and suggestions regarding the proposed amendment;
- To verify that stakeholder comments have been accurately recorded;
- To draw on local knowledge in the process of identifying environmental and social issues associated with the amendment, and to involve I&APs in identifying ways in which these can be addressed; and
- To comply with legal requirements.

4.2. PHASES OF PUBLIC PARTICIPATION

The PPP is designed in three main phases, namely:

Stakeholder Engagement Phase

- Identification of stakeholders;
- Notification of the public of the formal process;
- Distribution of a Background Information Document (BID), placement of newspaper adverts and site notices; and
- Gathering concerns, suggestions and comments from I&APs.

Reviewing of Draft Report

Prior to the submission of the final amendment application, I&APS are given the opportunity to review the draft report and submit comments and concerns regarding the proposed amendment. These comments will be incorporated within the final report to be submitted to the competent authority.

Decision-Making Phase

- With completion of the authorisation process, all registered I&APs will be notified of the decision made by the competent authority and will be provided with details should they want to appeal the decision.

4.3. COMPILATION AND DISTRIBUTION OF PUBLIC PARTICIPATION DOCUMENTS

The following documents were compiled and distributed to I&APs and can be found in **Appendix D**:

- I&AP database (**Appendix D1**). The database for I&APs from the previous EIA process was utilised and is being updated as additional parties register their interests. The sources used to compile the database included site visits, calls and internet research.
- Invitation emails sent to stakeholders on the 23rd of August 2019 (**Appendix D2**)
- The BID was distributed to I&APs on the 23rd of August 2019 (**Appendix D3**).
- Proof of hand-delivery of BID on the 23rd of August 2019 (**Appendix D4**)
- Newspaper advertisement was published on the 23rd of August 2019 in the Witbank newspaper. (**Appendix D5)**
- Site Advertisements placed on the 22nd of August 2019, at the Kendal Power Station and three other locations: (**Appendix D6**). The coordinates for the site advertisements are as follows.

Table 5: Site advertisement coordinates

1	26° 3’ 22” S	29° 1’ 5” E
2	26° 7’ 28” S	28° 57’ 36” E

3	26° 6’ 4” S	28° 58’ 2” E
4	26°3’ 31” S	28° 58’ 4” E

- . Comments and Responses Report (**Appendix D7**). This is compiled on an on-going basis as comments are received from I&APs.

Hard copies of the Draft Amendment Motivation Report (this report) will be made available at the Kendal Power Station main gate, Kuhle Premium Fuels station and Zomhlaba Resource Mine main gate.

This report will be distributed to I&APs for a 30-day commenting period (as per Section 32 of the EIA Regulations). At the end of the review period, it will be updated, incorporating I&APs comments. The final report will be submitted to DEFF for final decision making.

4.4. SUMMARY OF THE ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

a) Stakeholder Engagement Phase

I&APs accepted the BID. The comments provided for this stage of the PPP include those from various s stallholders concerned about the wellbeing of the surrounding communities. Refer to comments and responses report appended

5. SUMMARY OF IMPACT ASSESSMENT PREVIOUSLY UNDERTAKEN FOR THE EXEMPTION AUTHORISATION

According to the, Continuous ADF Environmental Impact Report (EIR) (September 2014) (DEA/EIA/00001508/2012), the following environmental aspects were assessed and recorded with regards to Exemption Authorisation time period. The assessments were based on selected environmental aspects that were at risk of incurring the most impacts as a result of the disposal of the ash without a liner.

5.1. SURFACE WATER

The Kendal ADF falls within the B20E catchments. The main drainage feature of the area is the Wilge River which drains northwards, including several tributaries to the Wilge River situated to the West of the site

According to the Surface Water Assessment conducted in June 2014 (Golder Associates Africa, 2014) The streams surrounding the ADF were already impacted either by the existing disposal facility at the time or the mining activities within the area.

Based on the location of the Kendal ash disposal area within the catchment, it was likely that it could have an impact on the Wilge River due to the tributaries flowing downstream from the site. The Wilge River has been classified as a Class II river which means that it is to be protected and kept in good state.

In terms of surface water quality, samples were collected between August 2011 and July 2012 which indicated high pH, electrical conductivity (EC), sodium (Na), phosphorus (P), chloride (Cl) and sulphate (SO_4) concentrations;

The water quality of the clean and dirty water dams was similar; no metals were analysed none were detected in any of the samples, except for aluminium (Al). High faecal coliforms (FC) counts in the clean water dam were also detected.

5.2. GROUNDWATER

A Groundwater Baseline Study was conducted by Golder Associates Africa in 2014 (2014:28). It was recorded that the that the Continuous ADF was “dry” and was not presenting any impacts on groundwater resources. The groundwater vulnerability of the previous ADF and the anticipated Continuous ADF, was shown on the national ground water vulnerability map as rating low to medium. The 2019 assessment by Golder Associates Africa show that the status has not changed, vulnerability rating is still low to medium (Figure 22 of Appendix E1). (Furthermore, the qualitative impact assessment for groundwater indicated that the unlined exemption footprint will pose a risk of low significance to groundwater and will be limited to the exempted area.

5.3. SOIL

The soils assessment report (Earth Science Solutions, 2014) indicated that the majority of the soils within the Continuous ADF are free draining. This meant that any polluted leachate from the ADF would definitely be mobile through the soil layers and reach groundwater resources.

Despite the fact that soils drain freely, no significant impact from the previous ADF was evidenced in the groundwater monitoring. It is evident that there was a low risk that polluted leachate was leaving the ADF. This indicated that there was a very low risk that the continued operation of the previous ADF (no lining) would pose an impact to the soil during the exemption period.

6. POTENTIAL IMPACTS DUE TO THE AMENDMENT

The possible impacts associated with the proposed amendments include the following

Table 6: Potential impacts

Groundwater	Potential groundwater pollution through the leachate from the unlined ADF.	
Surface water	Deterioration of surface water quality due in existing waterbodies. (e.g. Leeuwfonteinspruit and the Schoongezichrspruit)	
Soil	Soil contamination through leachate from the unlined ADF or directly from the contact of the ash with the bare soil.	
Socio -Economic	Economic	Indirect impact on agricultural businesses due to utilisation of the possibly polluted groundwater/surface water and soil.
	Health	Indirect impact on the health of surrounding communities due to the utilisation of possibly polluted water.
Aquatic Ecology	Potential impact on the aquatic ecology within surface waterbodies.	
Terrestrial Ecology	Soil contamination may lead to indirect impact on the terrestrial vegetation.	

7. SPECIALIST OPINION ON PROPOSED AMENDMENTS

Three specialists' studies were undertaken during the 2015 exemption application in 2015. During initial consultation with the competent authority, it was suggested the studies be subjected to specialists' onion to determine potential impact the amendment of the exemption would potentially have. The studies are listed below and reports appended in this report: This extension motivation amendment considered the opinions from the following specialists' studies:

- Groundwater Impact assessment: Appendix E1
- Surface Water Assessment: Appendix E2
- Soil and Land Capability Assessment: Appendix E3

The objective of the specialists' opinion is to advise Eskom, the EAP, and subsequently the competent authority if the proposed ashing on the exempted area footprint beyond the initial authorised period will pose any significant risks or impacts to the receiving environment.

7.1. GROUNDWATER

Golder Associates Africa undertook as study to assess the impact the proposed amendment will have on the groundwater on and around the project area. According to the findings of the assessment using the standardised impact assessment methodology, the impact risk on groundwater quality is classified as **Class** 2 with a **low impact**. Therefore, it can be concluded that the exemption area has a low impact on the groundwater quality (Appendix E1; (Golder Associates Africa, 2019)

7.2. SURFACE WATER

The surface water assessment (Golder Associates Africa, 2019) outlines the current status of the waterbodies and the impact that the proposed time extension could have on the resource. The following was noticed during the assessment.

- Upstream impacts, specifically mines have had an impact on the water resources. Decant of water from the mine workings into the Farm Dam has affected its quality of water.
- All samples collected in November 2018, February 2019 and July 2019 indicate high electrical conductivity (EC) and total dissolved solids (TDS), sodium (Na), chloride (Cl) and sulphate (SO_4) concentrations;
- All metals except for aluminium were very low at all sites. Aluminium was elevated at all sites except for the most upstream points on both streams and the most downstream point after the confluence of the two streams.
- Boron and fluoride which were shown to be leachable from the ash, are within the WQPL, except for boron at AP11, the dam west of ash stack in Leeuwfonteinspruit.

The Wilge River catchment (and associated tributaries) is a priority and has been classified as a Class II river and will require water use activities in its catchment to be conducted in a safe and

responsible manner so as not to increase the existing impacts on water quality. Adequate stormwater management around the ADF is therefore a priority.

Surface water monitoring in and around Kendal Power Station must continue, to enable early warnings where changing trends are noted and ensure mitigation is implemented timeously. This may mean that Kendal will need to collaborate with the upstream users. The following is a summary of the risk ratings and proposed mitigation measures of the possible impacts identified.

Table 7: Surface water impacts

Impact description	Risk rating before mitigation	Risk rating after mitigation	Proposed Mitigations:
Deterioration of water quality in the resource: Run-off from the ADF to the dams, Leeuwfonteinspruit and the Schoongezichrspruit will contribute further to the deterioration of the resource and ultimately impact on the downstream water users	Moderate	Low	• Clean and dirty water around the ADF must be separated to comply with GN 704; • The functioning of the three-dam system should be addressed, so that they function as originally intended and water in the resource will be improved upstream of the ADF; • Decant of water from the mine workings into Farm Dam must be prevented, as this will also ensure cleaner water to downstream users.
Cumulative impact: Overflow of poor-quality water from Farm Dam and clean water dam into the resource will contribute to deteriorating water quality impacting on downstream users. Decant of water from the mine workings into	High	-	No mitigation

Impact description	Risk rating before mitigation	Risk rating after mitigation	Proposed Mitigations:
Farm Dam has affected the quality of water in Farm Dam. Contaminated run-off from the ADF will contribute further load to an already contaminated resource.			

In conclusion, it is the opinion of the specialist that continued ash disposal to the existing footprint is unlikely to change the impacts currently seen in the Leeuwfonteinspruit and the Schoongezichtspruit. The conditions set as part of the Integrated Water Use License (IWUL) will assist in mitigating against the cumulative impacts to the water resources. Should the measures not be implemented then it is likely that there will be an impact on the Wilge River from the tributaries flowing downstream from the site. Refer to **Appendix E2** for the detailed report.

7.3. SOIL AND CAPABILITY

The proposed amendment is to extend the time period in which ash will be disposed on an un-lined surface. The soil/land will be in direct contact with the ash therefore an impact assessment was conducted. The soil and land capability of the project area was assessed and according to the Soil and Land Capability report (Earth Science Solutions, 2019), the following findings were identified;

- There is no additional impact on the soils and/or the land capability outside of the area of legal authorisation due to the current ash disposal activities.
- There has been no change in the baseline conditions of the soils or the land capability on the area outside of the legal area of disturbance, the management of both erosion and compaction having been engineered and mitigated through the construction of berms and defined roadways;
- The area is considered as part of the license agreement for ongoing deposition is being managed well, and any/all impacts associated with the ash deposition is contained within the dirty water management area (bunded area).

Assuming that the present rate of deposition is maintained, the specialist is of the opinion that using the exempted area to its full capacity should have no additional impact or limitations on the project. Refer to the appended report in **Appendix E3.**

8. THE ASSOCIATED ADVANTAGES AND DISADVANTAGES OF THE PROPOSED AMENDMENT

Below is a summary of the advantages and disadvantages of the proposed amendment.

Advantages

- Eskom will continue ashing on an authorised footprint, therefore no impacts outside of the exempted area are anticipated.
- The ashing philosophy will be effectively executed to link the exemption and ADF areas successfully;
- Eskom will have sufficient time to construct the Class -C liner for the Continuous Ash disposal facility.
- Eskom will remain in compliance with the Integrated Environmental Authorisation as well as the Exemption authorisation granted.

Disadvantages

- Eskom seeks to extend the four-year timeframe up until the full capacity of the exempted area is reached. The prolonged timeframe may lead to cumulative impacts which are incapable of being mitigated. The decant of water from the mine workings, upstream into the Farm Dam has affected the quality of the water. Contaminated run-off from the ADF will further contribute to the load.
- There is a potential for indirect impacts that will affect the biodiversity, health and safety of water users and the businesses within the area.
  the health of downstream users who may use contaminated water for crop irrigation and or drinking water for livestock.
- The project can set precedence for other developer to engage the procedure of seeking exemption from complying with conditions of IEA.

9. IMPACT ASSESSMENT FOR PROPOSED AMENDMENTS

9.1. PROPOSED METHOD OF ASSESSING THE ENVIRONMENTAL IMPACTS

The assessment of the potential impacts is guided by Guideline 5: Assessment of Alternatives and Impacts developed in line with EIA Regulations. The objective of the assessment of impacts is to identify and assess all the significant impacts that may arise from the undertaking of an activity. The findings of impact assessments are used to inform the competent authority's decision as to whether the activity should be authorised, authorised subject to conditions that will mitigate the impacts to within acceptable levels or should be refused.

Different types of impacts may occur from the undertaking of an activity. The impacts may be positive or negative and may be categorised as being direct (primary), indirect (secondary) or cumulative impacts (additional to existing).

Direct impacts are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.

Indirect impacts of an activity are indirect or induced changes that may occur as a result of the activity (e.g. the reduction of water in a stream that supplies water to a reservoir that supplies water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.

Cumulative impacts are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g. discharges of nutrients and heated water to a river that combine to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.

The first stage of risk/ impact assessment is the identification of environmental activities, aspects and impacts. This is supported by the identification of receptors and resources, which allows for an understanding of the impact pathway and an assessment of the sensitivity to change. The definitions used in the impact assessment are presented below:

- An **activity** is a distinct process or task undertaken by an organisation for which a responsibility can be assigned. Activities also include facilities or infrastructure that is possessed by an organisation.
- An **environmental aspect** is an element of an organisation's activities, products and services which can interact with the environment. The interaction of an aspect with the environment may result in an impact.
- **Environmental risks/impacts** are the consequences of these aspects on environmental resources or receptors of particular value or sensitivity, for example, disturbance due to noise and health effects due to poorer air quality. In the case where the impact is on human

health or wellbeing, this should be stated. Similarly, where the receptor is not anthropogenic, then it should, where possible, be stipulated what the receptor is.

- **Receptors** can comprise, but are not limited to, people or human-made systems, such as local residents, communities and social infrastructure, as well as components of the biophysical environment such as wetlands, flora and riverine systems.
- **Resources** include components of the biophysical environment.

Impact rating

The significance of the impact is assessed by rating each variable numerically according to the defined criteria. Refer to the table below. The purpose of the rating is to develop a clear understanding of influences and processes associated with each impact. The severity, spatial scope and duration of the impact together comprise the consequence of the impact and when summed can obtain a maximum value of 15. The frequency of the activity and the frequency of the impact together comprise the likelihood of the impact occurring and can obtain a maximum value of 10. The values for likelihood and consequence of the impact are then read off a significance rating matrix and are used to determine whether mitigations are necessary or not. The assessment of significance is undertaken twice, without mitigations and with mitigations. The assessment criterion is illustrated in **Table 8** (a and b) below.

Table 8: Criteria for Assessing Significance of Impacts

a) LIKELIHOOD DESCRIPTORS

PROBABILITY OF IMPACT	**RATING**
Highly unlikely	1
Possible	2
Likely	3
Highly likely	4
Definite	5
SENSITIVITY OF RECEIVING ENVIRONMENT	**RATING**
Not sensitive/important	1

With limited sensitivity/importance	2
Moderately sensitive/important	3
Highly sensitive/important	4
Critically sensitive/important	5

b) CONSEQUENCE DESCRIPTORS

SEVERITY OF IMPACT	**RATING**
Insignificant / ecosystem structure and function unchanged	1
Small / ecosystem structure and function largely unchanged	2
Significant / ecosystem structure and function moderately altered	3
Great / harmful/ ecosystem structure and function Largely altered	4
Disastrous / ecosystem structure and function seriously to critically altered	5
SPATIAL SCOPE OF IMPACT	**RATING**
Activity specific/< 5 ha impacted	1
Development specific/ within the site boundary	2
Local area/ within 1km of the site boundary	3
Regional within 5km of the site boundary	4
Entire habitat unit / Entire system / > 5000ha impacted	5
DURATION OF IMPACT	**RATING**
One day to one month	1
One month to one year	2
One year to five years	3
Life of operation or less than 20 years	4

Permanent	5

Table 9:Significance rating matrix

CONSEQUEENCE (Severity + Spatial Scope + Duration)															
LIKEHOOD (Probability + Sensitivity)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150

Table 10:Positive/ Negative Mitigation Ratings

SIGNIFICANCE RATINGS	VALUE	NEGATIVE IMPACT MANAGEMENT RECOMMENDATION	POSITIVE IMPACT MANAGEMENT RECOMMENDATION
Very high	126-150	Improve current management	Maintain current management
High	101-125	Improve current management	Maintain current management
Medium-high	76-100	Improve current management	Maintain current management
Medium-low	51-75	Maintain current management	Improve current management
Low	26-50	Maintain current management	Improve current management

SIGNIFICANCE RATINGS	VALUE	NEGATIVE IMPACT MANAGEMENT RECOMMENDATION	POSITIVE IMPACT MANAGEMENT RECOMMENDATION
Very low	1-25	Maintain current management	Improve current management

The following points were considered when undertaking the assessment:

- Risks and impacts were analysed in the context of the project's area of influence encompassing:
- Primary project site and related facilities that the client and its contractors develop or control;
- Areas potentially impacted by cumulative impacts for further planned development of the project, any existing project or condition and other project-related developments; and
- Areas potentially affected by impacts from unplanned but predictable developments caused by the project that may occur later or at a different location.

Mitigation measure development

The following points present the key concepts considered in the development of mitigation measures for the proposed development:

- Mitigation and performance improvement measures and actions that address the risks and impacts are identified and described in as much detail as possible.
- Measures and actions to address negative impacts will favour avoidance and prevention over minimization, mitigation or compensation.
- Desired outcomes are defined, and have been developed in such a way as to be measurable events with performance indicators, targets and acceptable criteria that can be tracked over defined periods, with estimates of the resources (including human resource and training requirements) and responsibilities for implementation.

Recommendations

Recommendations are developed to address and mitigate impacts associated with the proposed development. These recommendations also include general management measures which apply

to the proposed amendment. Mitigation measures are developed to address issues throughout the life of the activity.

9.2. IMPACT ON GROUNDWATER

Activity	Direct Impact	Significance	Proposed mitigations
Ashing on an exempted footprint of 35-ha	The pollution of underground water.	**14 (Very low)**	• Ensure that the components that make up the ash are measured and recorded. • Groundwater monitoring should continued throughout. • Ensure that any addition hazardous material not categorised within the contents of the ash is prohibited from being disposed on the proposed site. • Should pollution be detected through monitoring, a deep mitigation trench or curtain should be dug between the exmpted area and the stream to the west of the ADF. This trench will assist in capturing polluted groundwater before it poses risk to surface water and groundwater resources west of the facility.

Significance	Probability	Sensitivity	Severity	Spatial scale	Duration	Likelihood	Consequence	Rating
Without mitigation	2	2	3	3	2	**4**	**8**	**32 (Low)**
With mitigation	1	1	2	3	2	**2**	**7**	**14 (Very Low)**

9.3. IMPACT ON SURFACE WATER

Activity	Cumulative Impact	Significance	Proposed mitigations
Ashing on an exempted footprint of 35ha	The deterioration of Surface water quality due to run-off from the ADF to the dams, Leeuwfonteinspruit and the Schoongezichrspruit. This will contribute further to the deterioration of the adjacent farm dam and ultimately impact on the downstream water users.	**28 (Low)**	• Surface water monitoring should be undertaken on a monthly basis at specific points to assess water quality trends. • Appropriate storm water management at the toe of the ash facility should be maintained, in order to prevent sediment/ash-laden runoff entering the surface water in a rainfall event. • Monitoring must continue to be undertaken on a quarterly basis and extra attention must be given to the following variables. – Electrical Conductivity (mS/m) – Total Dissolved Solids – Chloride – Sulphate – Magnesium – Sodium – Aluminium

Activity	Cumulative Impact	Significance	Proposed mitigations
	Overflow of poor-quality water from Farm Dam and clean water dam into the resource. Contaminated run-off from the ADF will contribute further load to an already contaminated resource.		– Fluoride; and – Boron • Should increasing trends be noted in any of the parameters measured, then more frequent surface water monitoring must be undertaken, and the source of the problem identified and mitigated.

Significance	Probability	Sensitivity	Severity	Spatial scale	Duration	Likelihood	Consequence	Rating
Without mitigation	4	3	4	4	2	**7**	**10**	**70 (Medium Low)**
With mitigation	2	2	2	3	2	**4**	**7**	**28 (Low)**

9.4. IMPACT ON AQUATIC ECOLOGY

Activity	**Indirect Impact**	**Significance**	**Proposed mitigations**
Ashing on an exempted footprint of 35ha	Impact on the aquatic Ecology	**24 (Very low)**	• Water quality monitoring should be continued as stipulated in the WUL • On-groing egagement with other water-users are necessary to nature good relationship and equitable use of water resources. • The applciant should have a rehabilitation plan, should pollution of groundwater occure frm their activities.

Significance	**Probability**	**Sensitivity**	**Severity**	**Spatial scale**	**Duration**	**Likelihood**	**Consequence**	**Rating**
Without mitigation	2	2	4	3	3	**4**	**10**	**40 (Low)**
With mitigation	1	2	2	3	2	**3**	**8**	**24 (Very Low)**

9.5. IMPACT ON SOIL

Activity	**Direct Impact**	**Significance**	**Proposed mitigations**
Ashing on an exempted footprint of 35ha	The pollution of soil.	**15 (Very low))**	• Carefull consideration should be taken with regards to soil contamination as it may lead to indirect impacts on the groundwater and surface water. • Ensure that the components/elements that make up the ash is recorded and and measuured accordingly. • Topsoil should be recovered from position in front of the advancing ash face before it is covered by ash. Once stripped the topsoil shold be utilised for rehabilitation purposes. • Leachate shold be monitored regularly and tested for above standard concentrations.

Significance	**Probability**	**Sensitivity**	**Severity**	**Spatial scale**	**Duration**	**Likelihood**	**Consequence**	**Rating**
Without mitigation	3	3	2	3	3	**6**	**8**	**48(Low)**
With mitigation	1	2	1	2	2	**3**	**5**	**15(Very Low)**

9.6. IMPACT ON SOCIO- ECONOMIC

Activity	Indirect Impact	Significance	Proposed mitigations
Ashing on an exempted footprint of 35ha	Impact on the surrounding businesses and the health of surrounding communities utilizing borehole and surface water.	**21 (Very low)**	• Notification of potential threats to the health or crop of surrounding communities/businesses must be done as soon as such threats are identified. • Where possible compensation measures should be considered to surrounding dwellers/ bussineses if it is found that the groundwater used by surrounding landowners has been polluted by the ADF. • Water quality monitoring should be continued as stipulated in the WUL. • On-groing egagement with other water-users are necessary to nature good relationship and equitable use of water resources. • The applciant should have a rehabilitation plan, should pollution of groundwater occure frm their activities.

Significance	Probability	Sensitivity	Severity	Spatial scale	Duration	Likelihood	Consequence	Rating
Without mitigation	2	4	4	3	3	**6**	**10**	**60 (Medium-low)**
With mitigation	1	1	1	3	3	**4**	**7**	**21 (Very low)**

10. MOTIVATION FOR AMMENDMENT

The Exemption Authorisation that was granted to Eskom is valid till 5 May 2020. There are several phases for the construction of the Continuous ADF and it was anticipated that within the authorised four-year period, the Continuous ADF would be complete. Ashing would then continue to take place on the lined surface.

Kendal will not be able to fully construct the Continuous ADF within the time period granted as the construction is anticipated to commence in February 2020. However, the applicant is still within the valid exemption period and the footprint allocated for the exemption will have a remaining 35 hectares until it reaches its full capacity. Till to date the Kendal Power Station has been in compliance with the conditions set out in the Exemption Authorisation, and prefers to remain so.

As the exempted portion of the Continuous ADF had the potential to impact the water quality around the site., quarterly water quality monitoring is conducted on-site. Although certain variables were above the excepted levels.

Furthermore, through a site inspection conducted recently by a land and soil specialist. It was found that the current estate of the environment has not been additionally impacted by the Kendal ADF outside of the area of legal authorisation as no change in the baseline conditions were identified. This is a result of the correct management of any/all impacts associated with the ash disposal facility of which Kendal will continue to adhere to.

11. RECOMMENDATIONS

Following the assessment of potential impacts associated with this application, Green Gold recommends that DEA grant approval to Eskom to dispose ash on the remainder of exempted area footprint until the area is fully utilised. The following recommendations are made following the assessment of potential impacts and the specialist's opinions:

- The applicant should strive to comply with conditions of water-use license dated December 2015.
- The applicant should strive to comply with all other conditions of the IEA dated July 2015; and
- Appropriate storm water management at the toe of the ash facility should be maintained.

12. CONCLUDING ENVIRONMENTAL STATEMENT

Kendal Power Station has adhered to the conditions set out in the Exemption Authorisation and intends to keep it up after exemption has been granted for ashing on the remaining footprint. As the extension does not include the expansion of the existing footprint, the anticipated environmental impacts will remain similar to those of which were indicated in the Continuous ADF, EIA report and the exemption application. Furthermore, Eskom intends to mitigate the impacts according to the Exemption Authorisation conditions.

The two environmental aspects of major concern (soil/land and water) have been found to not have been significantly affected by the ash within the exempted area. Therefore, the granting of ashing continuity on the remaining exemption footprint should not have a significant impact on the environment.

13. REFERENCES

Earth Science Solutions. (2014). *Soil and Land Capability Report.*

Earth Science Solutions. (2019). *Specialist Opinion- Soil and Land Capability Report.*

Golder Associates Africa. (2014). *Groundwater Basline Study.*

Golder Associates Africa. (2014). *Surface Water Assessment.*

Golder Associates Africa. (2019). *Groundwater Baseline Study and Qualitative Impact Assessment.*

Golder Associates Africa. (2019). *Surface Water Impacts Assessment.*