ESKOM Holdings SOC Ltd

FINAL S24M EXEMPTION APPLICATION MOTIVATION REPORT:

12014KNK

Majuba Continuous Ash Disposal Facility

October 2015

SUBMITTED BY:
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ABBREVIATIONS

ADF	Ash Disposal Facility
ARLP	Acid Rain Leach Procedure
DEA	Department of Environmental Affairs
DPE	Department of Public Enterprises
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
EMPr	Environmental Management Programme
I&APs	Interested and Affected Parties
PES	Present Ecological Status
PFMA	Public Finance Management Act
SIA	Social Impact Assessment
WML	Waste Management Licence
WUL	Water Use Licence
XRD	X-Ray Diffraction

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DOCUMENT CONTROL

Date	Revision	Name	Role	Signature
21 October	Draft	PD Brummer	Author	
29 October	000	PD Brummer	Review	

DOCUMENT CHANGE HISTORY

Date	From Version	To Version	Paragraph Reference	Change Description

EXECUTIVE SUMMARY

Introduction

Lidwala Consulting Engineers (SA) (Pty) Ltd (Lidwala) was appointed by Eskom Holdings SOC Limited to investigate and undertake the licensing process for the continuation of its ash disposal facility at Majuba Power Station in the Mpumalanga Province.

It is envisaged that the total area to be covered by the Ash Disposal Facility (ADF) will be in the order of 1 162 hectares for the life of the station, including land currently being ashed upon. In order to achieve this footprint, an additional footprint of approximately 800 hectares (as described in the EIA report: Lidwala, 2014) is required.

Eskom pro-actively aligned its continued ashing activities with the requirements of the waste licensing processes in line with the environmental laws such as the National Environmental Management Waste Act, Act 59 of 2008, in particular. Classification of the ash, according to the 2013 Norms and Standards for waste disposal to landfill resulted in a Type 3 Category, which requires protection by a Class C liner. It is therefore necessary for future ashing operations at Majuba Power Station to comply with this liner requirements.

The Eskom process of installing a Class C liner which includes front end planning activities, engineering designs, commercial process and construction is estimated to take approximately six (6) years, post-environmental authorisation for Majuba ashing facility. The duration to get this lined surface ready for ashing may result in delays in achieving immediate compliance with respect to the liner. Eskom is thus applying for exemption for the said liner requirements for a temporary duration of up to 6 years from acquisition of the DEA decision, as shown in Table 1 below. Thus, Eskom anticipates full installation of the Class C liner after six (6) years post authorisation. The estimated footprint required for this 6-year exemption at Majuba ashing facilities is only 75ha. This is based on the existing operation disposing rate of 12,5ha per year.

Task	Expected timeframes	Status
EIA and WML approval	August 2015	Authorisation granted in August 2015.
Detailed Design	15 months	September 2015 to November 2016
ERA	4 months	December 2016 to April 2017
Procurement	8 months	May 2017 to January 2018
PFMA	12 months	February 2018 – January 2019
Construction *(incl permits and regularity approvals)*	3 years	February 2019 – January 2022
Total years required for the exemption period	+/- 6 years	From September 2015 to January 2022

Scope of the exemption submission

Lidwala identified the potential environmental impacts of not lining the ADF for the next six years and assessed the Environmental implications of granting such an exemption. The intention was to incorporate the potential impacts and the associated mitigation strategy as part of an Eskom (S24M) motivation to DEA for exemption from lining the (ADF) for the 6-year period.

From an Environmental perspective, this motivation is based on the surface water and groundwater reports as well as the ash classification results that formed part of the EIA process. The intention of these studies and models were to illustrate a worst case scenario. The result of this is that the identified impacts and their significance ratings sketch the unmitigated state. The impacts as identified in these reports (surface and groundwater) will therefore be the impacts experienced during the transitional period (prior to lining).

Although Eskom is committed to being in line with environmental legislation in relation to its ashing activities for Majuba Power Station, the lining of the future ashing area can only be provided after 6 years from receipt of the IEA. This duration is inclusive of project planning/lead times within the internal and external governance processes taken into consideration. (e.g. Public Finance Management Act (PFMA) application to the Department of Public Enterprises).

Summary of Findings

The EIA study conducted for Majuba ash project showed that mostly localised impacts on surface and groundwater currently experienced will continue for the duration in which ash disposal occurs on an unlined facility. Wetland functionality will be lost for the wetlands at Alternative A, irrespective of the lining regime, because the ash facility footprint traverses these wetlands.

The groundwater model in the EIA Groundwater specialist report did not account for a liner as this study was conducted with the intention to describe the worst case pollution scenario. The model is therefore a good reflection of the plume migration in the unlined state.

Current monitoring results indicate that the existing ash disposal facility has impacted upon the water quality of both the shallow and deeper aquifer system. However, the plume is localised underneath and surrounding (approximately 100 meters), the current ash disposal facility and the existing surface water dams which contain water from the ash disposal facility.

In practice the current status quo and level of deterioration on the site will be maintained until such time that the liner can be integrated in the operations. The additional 75 hectares of unlined disposal area is seen as a small percentage in relation to the existing and proposed new facilities, and is anticipated to have minimal impact from status quo.

The EMPr for the EIA process considered the possibility of an exemption application (called the transitional arrangement), for a temporary period of up to 6 years. The EMPr, IEA and the WUL conditions should be complied with by the Eskom Engineers and the contractor responsible for construction and operation. The onsite monitoring plan should be revised and updated to accommodate the new monitoring network, as proposed in the groundwater report?

1. APPLICANTS DETAILS

Table 1: Details of the applicant

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Table 2: Details for the Majuba Power Station

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2. INTRODUCTION

Background

Lidwala Consulting Engineers (SA) (Pty) Ltd (Lidwala) was appointed by Eskom to investigate and license a continuation of the existing disposal facility at Majuba Power Station.

Majuba Power Station is a coal-fired power plant located between Amersfoort and Volksrust in the Mpumalanga Province. Large quantities of ash are produced as a by-product in the generation of electricity and are disposed of in an ash disposal facility. With regards to ash management, the station uses 'dry' methods of ash disposal. This process involves ash being transported from the power station by conveyors and disposed of on an ash disposal facility by means of a stacker and re-claimer?

Prior to the promulgation of Environmental laws such as the Environment Conservation Act, Eskom purchased a portion of land which they envisaged for the disposal of ash for the life of the Station (at that stage 45 years). Due to power station ash not being classified as a waste material at the design stage and the adoption of the 'dry' ashing method at Majuba, it was not deemed necessary at that time for the ash disposal facility to be authorised, although duty of care was implemented. After stripping the topsoil for rehabilitation of the final ash dump the clay layer was compacted to minimize leachate and the ash was placed directly onto the ground.

It is predicted that the total area to be covered by the ash disposal facility will be in the order of 1 162 hectares. In order to achieve this another 800 hectares will be added to the current footprint. Majuba Power Station employs a dry ash disposal method, i.e., the ash has a 20 % moisture content. Classification of the ash according to the 2013 Norms and Standards for Waste Classification, resulted in a Class C liner being required for future ashing operations at Majuba Power Station.

With the promulgation of the environmental laws such as the National Environmental Management Waste Act, Act 59 of 2008, in particular, Eskom pro-actively aligned its continued ashing activities with the requirements of the waste licensing processes.

Eskom is experiencing some complications (details section 3.3 of this report) in achieving immediate compliance and is therefore applying for exemption from the provisions of the Department of Environmental Affairs (DEA) Norms and Standards (2013), (and in specific the required Class C liner) on a temporary basis for a period up to January 2022. Lidwala assessed the Environmental implications of granting such an exemption.

From the perspective of the affected Environment, the essence of this motivation is based on the surface and groundwater reports that were compiled based on studies conducted in 2013 as well as the results of the ash classification report. The intention of these studies and models were to illustrate a worst case scenario and therefor did not include any mitigation measures in the formulation of predictions. The result of this is that the identified impacts and their significance ratings sketch the unmitigated state. The impacts as identified in these reports (surface and groundwater) will therefore be the impacts experienced during the transitional period (prior to lining)

3. OBJECTIVES OF THE REPORT

Eskom approached Lidwala to identify the potential environmental impacts of not lining the Ash Disposal Facility at Majuba Power Station during the mentioned period, post-acquisition of the IEA. The intention was to incorporate the potential impacts and the associated mitigation strategy as part of application to DEA for exemption from lining the Ash Disposal Facility.

4. ACTIVITY DESCRIPTION

To ensure a comprehensive motivation a short summary of the impacts that were identified during the Environmental Impact Assessment (EIA) are given below with a specific focus on the 75 hectare transitional area where Eskom requested to dispose of the ash without the liner. Current disposal (faces visible on the photo: figure 2) occurs just before the newly proposed alternative (purple outline in figure 2). The infrastructure is set up for the disposal to continue in a southerly direction. The Google image below indicates the area for which the exemption application is being made (white outline, Figure 2).

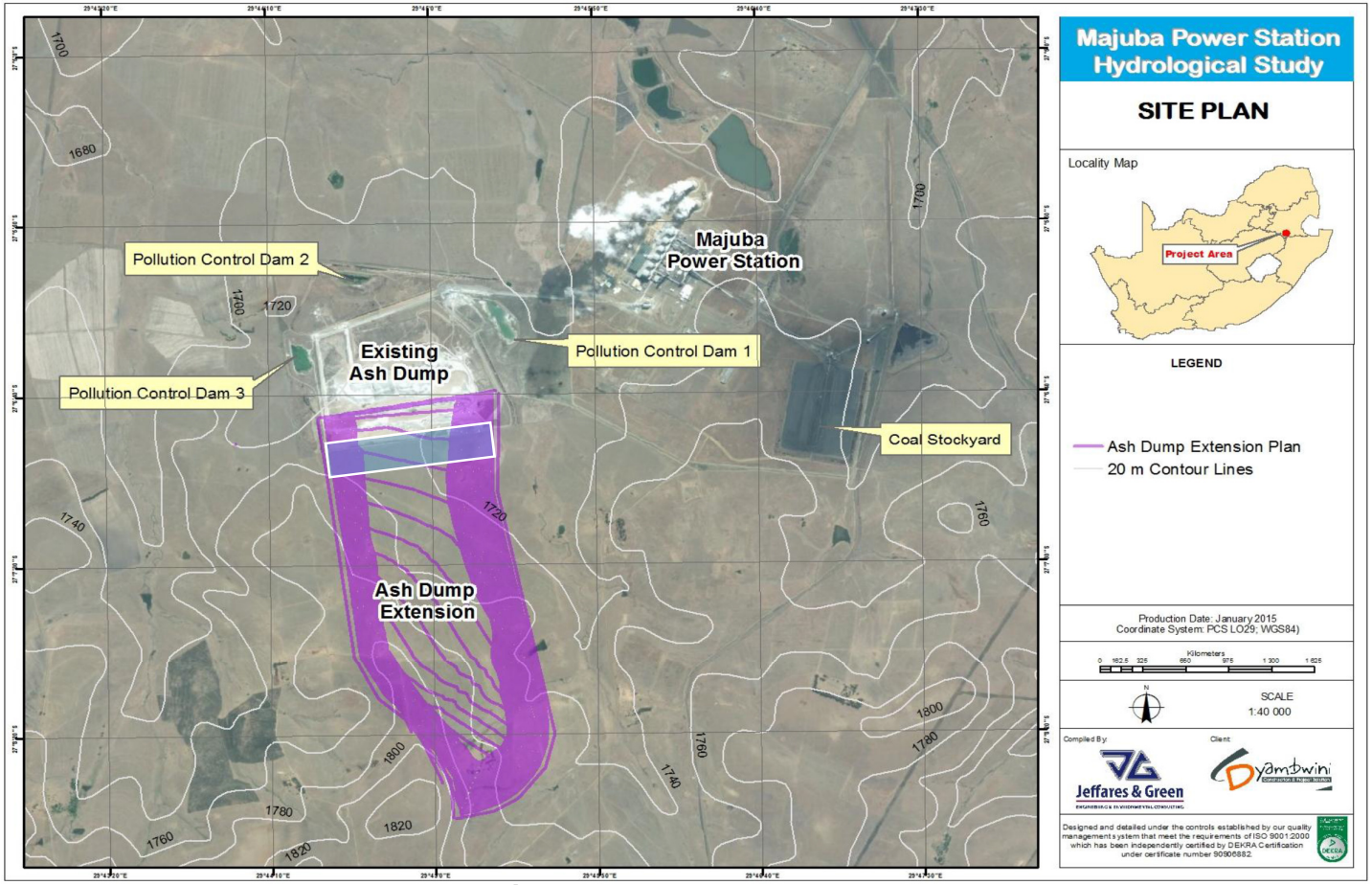

Figure 1: Google map of the area that forms part of this exemption application

4.1 Description of activity

In order to defer costs, Majuba decided to divide the 45 year ash disposal facility into 3 x 15 year areas and only constructed the pollution control and infrastructure works needed for the first 15 year area up front. Majuba will be running out of capacity on the current 0 - 15 year ashing area in the first quarter of 2016 and, will need to extend the pollution control and infrastructure works into the 15 - 30 year ashing area.

Looking at the timeframes and the legal requirements, this means that it will not be possible to line the 15 - 30 year ashing area by 2016. In order to allow Majuba to continue operating, it will be necessary to allow the ash disposal facility to progress onto the 15 - 30 year area following the current operations procedure without a liner, up to the point where the liner can be provided by January 2022 The liner will thus be installed from the point where the ash disposal facility will be in January 2022.

4.2 Eskom motivation

Eskom is a state owned utility and as such, the use of public funds goes through stringent investment and procurement governance processes. To minimize on unnecessary expenditure in order not to contravene the Public Finance Management Act (PFMA) on any project, thorough front end planning goes into the project during its development. The planning phase together with the investment and procurement process, in any Eskom ash disposal project, could amount to 4 to 6 years before the project could be executed. This planning excludes the application for licenses and permits from DEA, Department of Water and Sanitation (DWS) and includes approval from the Department of Public Enterprises (DPE) and any other authorising body that is deemed necessary for the project to progress. The application for Environmental licences/permits could take anything from 12 to 24 months. Once the EIA is approved the project will finalise its basic design and obtain investment approval. This whole process of finalising the designs and obtaining investment approval can take approximately 15 months. Besides the internal investment approval, Eskom will have to apply for the PFMA approval which can take approximately 12 months. Eskom's procurement processes takes approximately 8 months from the day of the PFMA approval to contract award. Once the contract has been awarded, construction time for the pollution control measures is planned for 3 years. This has a total lead time of approximately 6 years from the day Eskom receives the Environmental Authorisation to the day the pollution control measures are implemented and the ashing facility is ready for the disposal of ash. It is worth noting that these timelines does not include any variances due to unforeseen events.

Although Eskom is committed to aligning with environmental legislation in the ashing activities for Majuba Power station the lining of the future ashing area can only be provided by January 2022. This is when all the above approval process is taken into account.

4.3 Proposed timelines and milestones for installation of the Class C liner

Table 3: Timelines and milestones

Task	Expected timeframes	Indicative Scheduled date
EIA and WML approval	August 2015	Authorisation granted in August 2015.
Detailed Design	15 months	September 2015 to November 2016
ERA	4 months	December 2016 to April 2017
Procurement	8 months	May 2017 to January 2018
PFMA	12 months	February 2018 – January 2019
Construction *(incl permits and regularity approvals)*	3 years	February 2019 –January2022
Total years required for the exemption period	+/- 6 years	From September 2015 to January2022

5. LEGAL FRAMEWORK

5.1 Legal requirements

This section of the report highlights the relevant national legislation and regulations, which are applicable to (or have implications for) the proposed exemption application.

The application is for Exemption from chapter 2 Regulation 3(1)(c) of the National Norms and Standards for Disposal of Waste to Landfill (R.636) of 23 August 2013. The Exemption application is made in terms of Regulation 3 of the National Exemption Regulations (R.994), Section 24M of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and section 74 of the National Environmental Management Waste Act, 2008 (Act No. 59 of 2008) . The application is compiled in accordance with Regulation 4 of the National Exemption Regulations (R.994).

The following environmental Acts are applicable to this project:

- National Environmental Management Act No 107 of 1998 (with reference Section 24M);
- The National Environmental Management Waste Act No 59 of 2008;
- National Water Act No 36 of 1998.

5.2 Ash Classification

The ash was classified in terms of the DEA National Norms and Standards for Disposal of Waste to Landfill (R.636) of 23 August 2013. In terms of these waste assessment regulations, the ash is assessed as a Type 3 waste (low risk waste), which requires disposal on a landfill of which the performance of the barrier system complies with that of a Class C liner system. The outcome of the assessment was

the result of the leachable concentrations of boron and chromium VI, and the total concentrations of barium and copper in the ash.

6. DESCRIPTION OF THE RECEIVING ENVIRONMENT

6.1 Surface water

Ecotone Freshwater Consultants were appointed to undertake the freshwater ecology specialist component for the Environmental Impact Assessment (EIA) of the proposed continuous dry ashing at the Majuba Power Station. This study included a desktop and fieldwork component. See attached **Appendix A**

The report was consulted again to focus on the proposed area identified for unlined ashing in the compilation of this report.

In the following sections a short description of the affected Environmental, potential impacts and possible mitigation measures are given.

Figure 3 below shows the proposed area identified and recommended for continued ashing throughout the EIA process. The figure also indicates the identified wetlands.

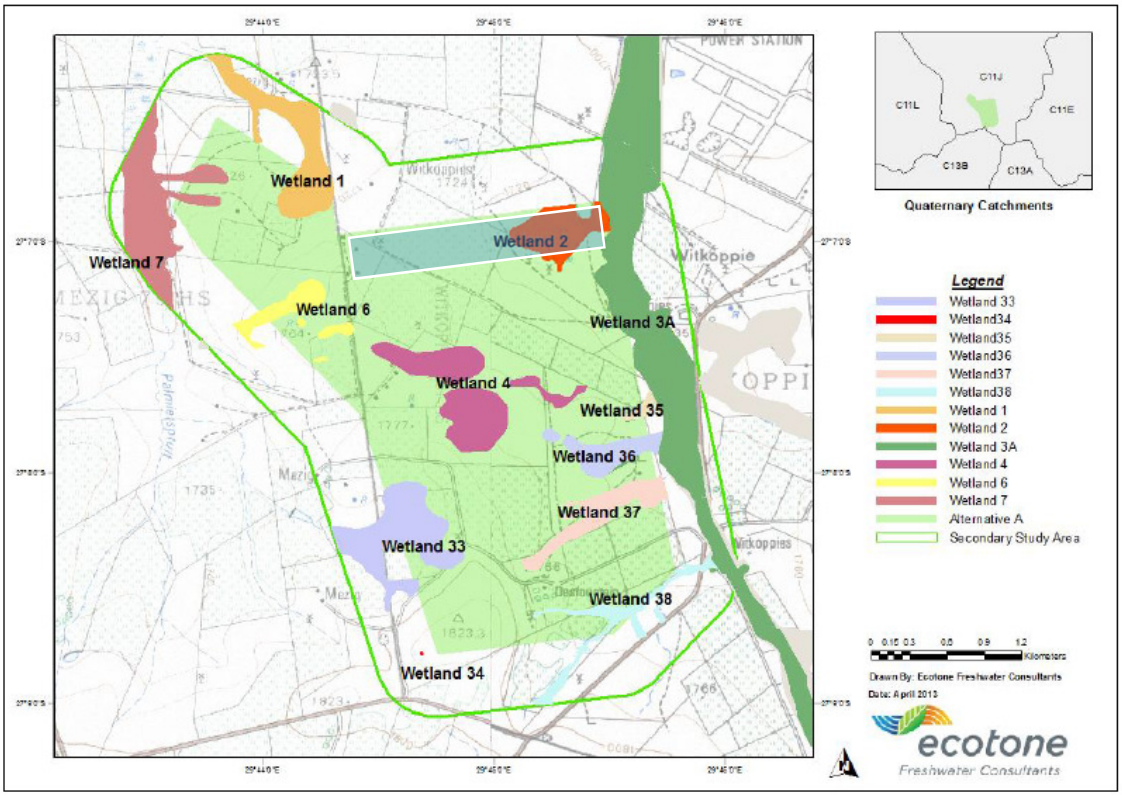

Figure 2: Alternative A that has been identified as the preferred alternative for continuous ashing, Majuba ADF EIA (2014). The figure indicate the approximate areas for the proposed unlined ashing (shaded in blue, bordered in white).

6.1.1 PES (Present Ecological State)

Wetland 2 (as affected by this application) were moderately impaired. The existing ashing facility has infringed on Wetlands 1 and 2 and, along with agricultural activity, resulted in a number of impacts. Wetlands 1 and 2 have lost direct wetland habitat due to infilling by ash deposition and are affected by ash deposition through wind transport and runoff.

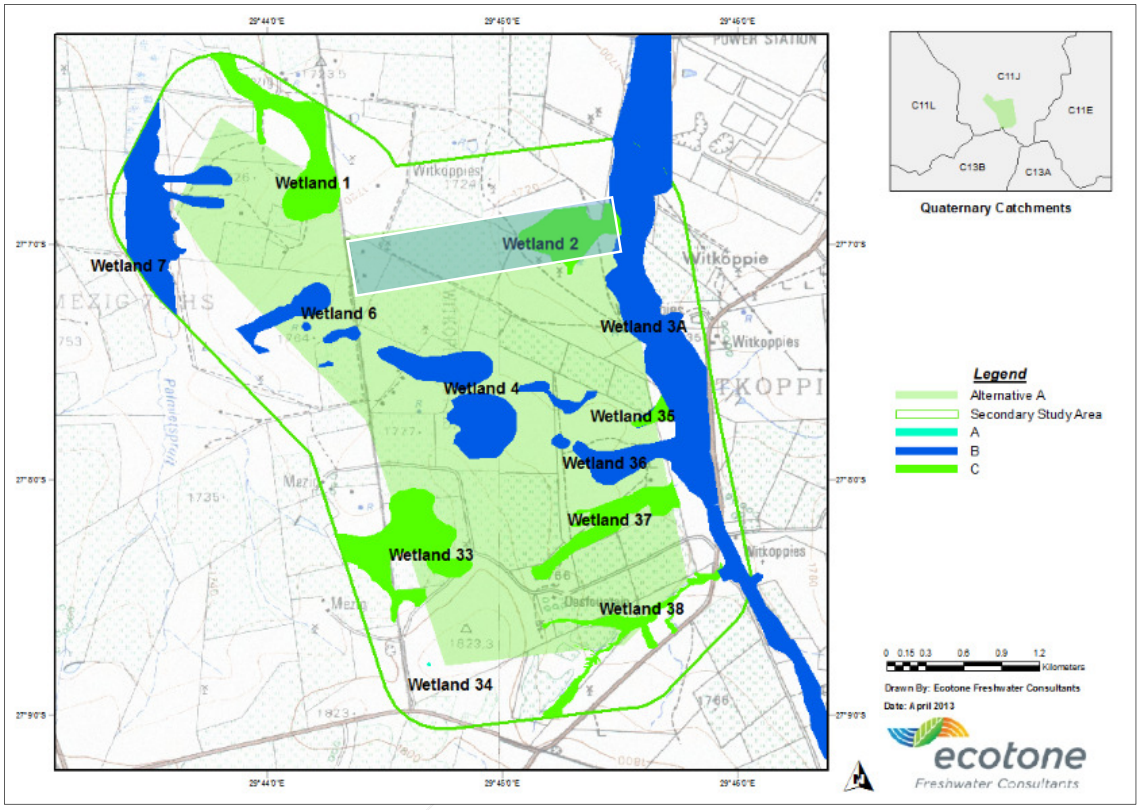

Figure 3: Map showing the Present Ecological State of wetlands at alternative A. Proposed area for unlined ashing shaded in blue, and bordered in white

Figures 5 below shows an image of the wetland site at Alternative A

Figure 4: Wetland 2 indicates the wetland that will be affected due to unlined ashing at Alternative A

6.1.2 Vulnerability

As part of the health assessment of wetland units the inherent vulnerability of wetlands were assessed (Macfarlane, *et al.,* 2009). Erosion and the rate of head cut erosion are dependent upon many factors

(such as soil type, vegetation cover and type, rainfall events, etc.) but one of the most critical factors is slope. For any given discharge, the steeper the slope the greater the risk of erosion. It follows that the slope of a wetland unit in relation to its size provides a measure of its vulnerability. The following section illustrates this relationship for the wetlands at Alternative A:

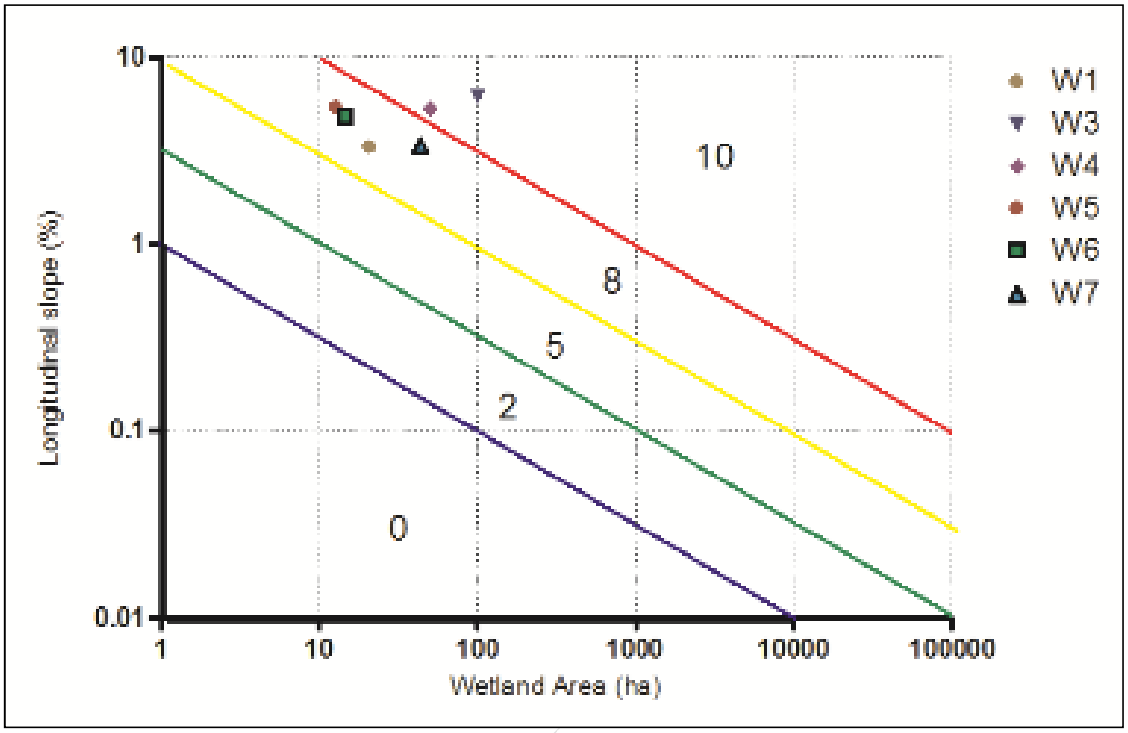

Figure 5: Vulnerability as a function of slope for wetlands at Alternative A.

The green line between 2 and 5 in Figure 6 indicates the equilibrium slope for a wetland unit given a particular size. Wetlands on Alternative A and its extension were, on average, more vulnerable compared to other alternatives. Wetland 3 in the figure will indirectly be impacted by the proposed unlined ashing and has been identified as the most vulnerable wetland (as a function of slope) at Alternative A.

6.1.3 WET EcoServices: Functional Assessment

Functional ecosystem services of wetlands in general include services such as flood control, nutrient cycling, erosion control, toxicant removal, carbon storage, phosphate assimilation, biodiversity maintenance, provision of food and water, cultural services and recreation. The presence of the service is subject to the potential exposure in the catchment and the wetland type. Please note the Wet-EcoServices methodology does not consider the size of a wetland; the larger the wetland the

greater the capacity to provide a particular service. General services associated with different wetland units are provided in Figure 7.

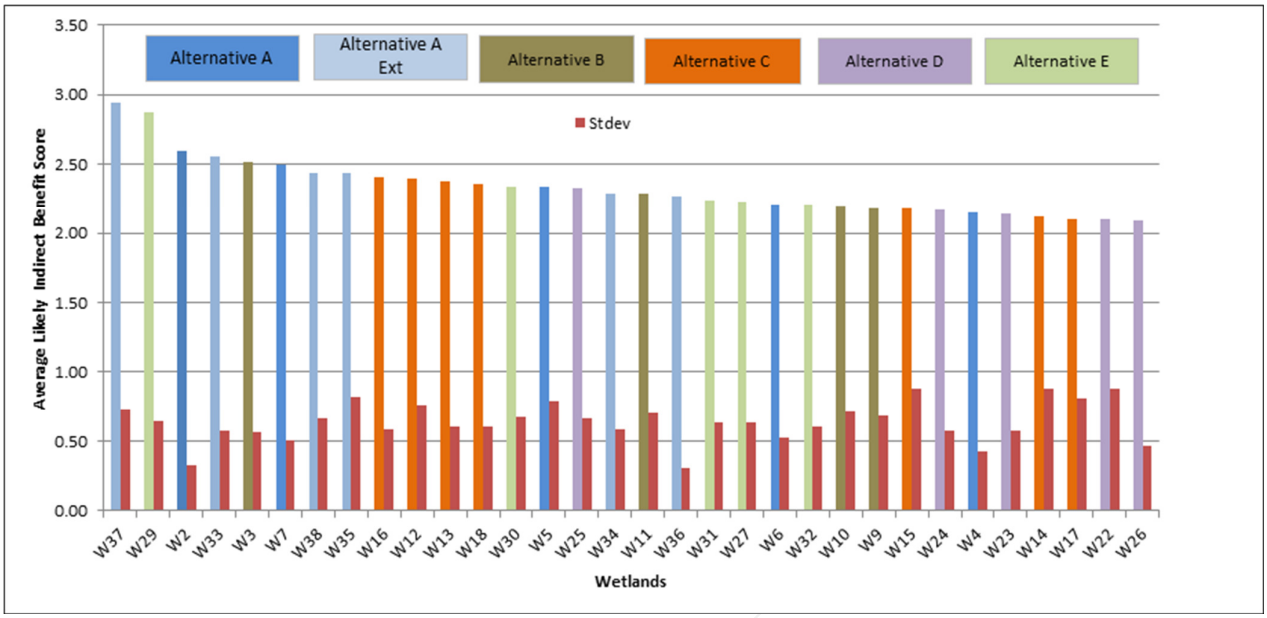

Figure 6: Overall average score for Ecosystem Services associated with all wetlands within the Majuba primary study area

Wetland 2 as affected by the proposed unlined ashing has the third highest indirect benefit score. These benefits will be lost regardless of the lining regime, seeing that this wetland form part of the proposed ashing area upon which the EA has been issued.

Table 4: Provides a summary of the assessment scores for the various wetlands at alternative A

Alternative A	Wetland 1	Wetland 2	Wetland 3A	Wetland 4	Wetland 5	Wetland 6	Wetland 7
Total wetland size	274.09 ha						
Wetland size on primary study area	85.32 ha						
Hectare Equivalents	232.57 ha						
PES	C	C	B	B	B	B	B
PES receiving watercourse	**C-** Witbankspruit						
Water Quality &Diatoms	Moderate to Good						
Eco-Services Score (Average)	2.31						
EIS (Median)	2 Moderate						

6.1.4 Impacts during construction and operations

Construction activity on Alternative A will impact directly on Wetlands , 2, 4,, 33, 35, 36, 37 and 38, while downslope Wetland 3 might also be affected. Main activities during the construction period will be vegetation clearing and top soil removal followed by the compaction of a clay layer to minimise leachate penetration. Subsequent impacts relate to direct loss of wetland habitat and functionality for

previously mentioned wetlands and changes to the hydrology, water quality and sediment loads of downstream receiving wetlands.

The loss of hydrological contributions from Wetlands 2, 4, 33, 35, 36, and 37 to the receiving floodplain systems (Wetland 3) are anticipated to be of Low to Moderate significance. The extent of vertic soils on this Alternative associated with the presence of local depressions (Wetlands 2 and 4) suggests a relatively lower importance to stream flow augmentation. The hydrological contributions of wetlands 2, 4, 33, 35, 36, and 37 are marginal considering the relatively large catchment of Wetland 3 .

6.1.5 Cumulative Impacts

Two thirds of Alternative A drain into Wetland 3A, which in turn drains into an unchannelled valley bottom (3B) located on Alternative B. Wetland 3B is already expressing upslope landuse impacts and will be at greater risk for cumulative impacts. Alternative A and its extension forms part of the upper catchment of a tributary flowing into the Witbankspruit. The Witbankspruit reflects a Moderate loss in ecological integrity and additional catchment alterations pose a cumulative impact risk. This said, the probability of cumulative impacts associated with Alternative A is low due to a high frequency of localised depressions and a small extent of directly affected valley bottom systems which will allow more containment of pollution from the proposed activities.

6.2 Soils

It was recommended that, if the construction of the proposed continuous ADF is to proceed within the specified area, the topsoil (0-300 mm) layer of the suitable mapping units be stripped and stored so that it will be available for future use, such as capping, cladding or landscaping. This would avoid the necessity of valuable topsoil being sourced elsewhere. The only exception to this guideline would be the clay soils of the **Ar** map unit, whose clay content and shrink-swell properties would be likely to cause problems if utilized for the above-mentioned purposes.

The clays would be compacted in the proposed unlined ashing area to prevent leachate from penetrating the deeper soils.

6.3 Groundwater

Based on the geology, it is considered that there are two main aquifer systems that exist in the area of interest:

- A shallow, weathered rock aquifer, referred to as the 'shallow aquifer'; and
- A deeper, hard rock fractured aquifer, referred as the 'deeper aquifer'.

Groundwater storage and transport in the un-weathered (deeper aquifer) Volksrust and Vryheid Formations and in the Karoo dolerites is likely to be mainly via fractures, bedding planes, joints and other secondary discontinuities. Fracturing of the edges of dolerite intrusions where they are in contact with the Karoo country rock are popular drilling targets. The success of a water supply borehole in these rocks would depend on whether one or more of these structures are intersected by the borehole. Neither the Vryheid nor the Volksrust Formations are considered to be particularly

prolific, and the argillaceous Volksrust Formation in particular is thought to have a low permeability (Baran, 2003).

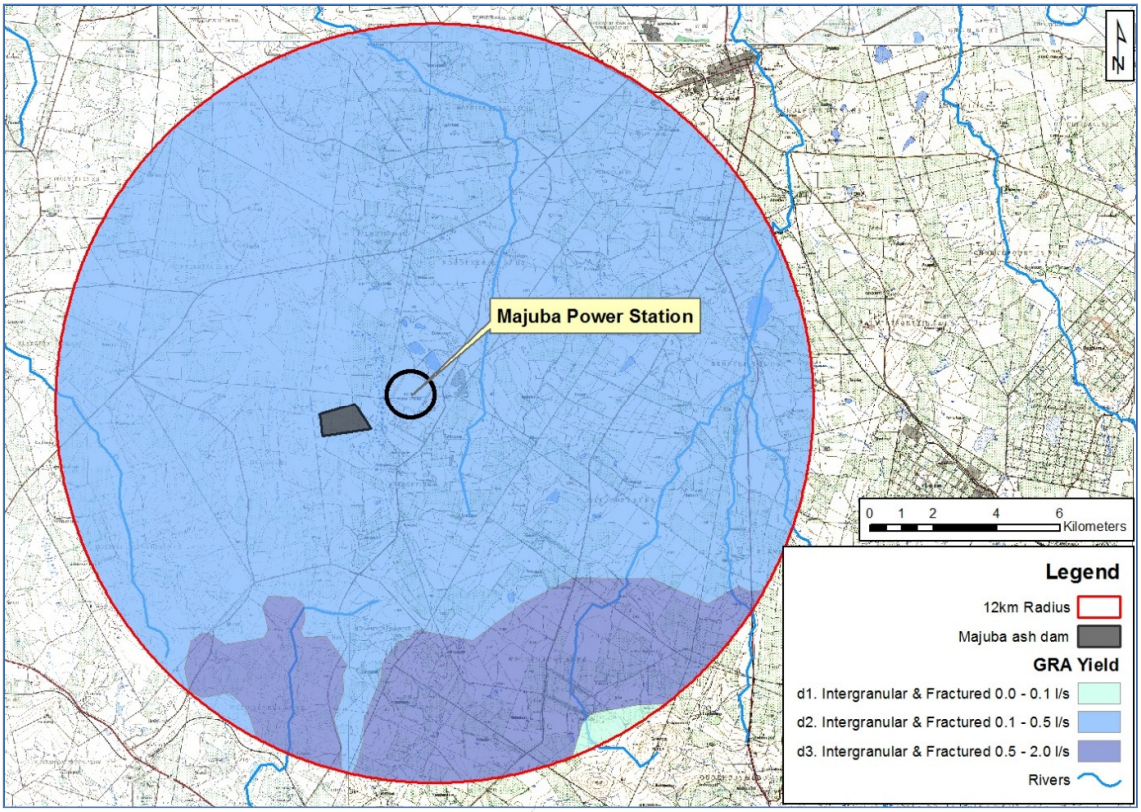

Figure 7: Extract of the hydrogeological map for the area in the vicinity of Majuba Power Station showing the existing ash disposal facility.

The main impacts on groundwater of the proposed ash disposal facility (which has also been confirmed by evaluating current impacts of the existing facility) are likely to be:

- Deterioration in groundwater quality; and
- Rise in groundwater levels in the immediate vicinity of the ash disposal facility due to additional recharge and groundwater mounding, which may alter the local groundwater flow direction.

A shallow water table occurs at borehole AB32 which is located very close to the proposed area for unlined ashing. The artesian and shallow nature of the borehole suggests that artificial recharge from dam AP01 may be influencing the groundwater depth in the vicinity of the dam (Please refer to the Groundwater report Appendix B for the location of boreholes).

Natural attenuation whereby the groundwater quality starts to recover due to recharge as well as due to influx of fresh water is suggested by the movement of the pollution plume underneath the ash stack (Figure 8). Groundwater underneath the older rehabilitated areas seems to improve in the upper aquifer system (SLR Pollution Plume Model Report, 2013).

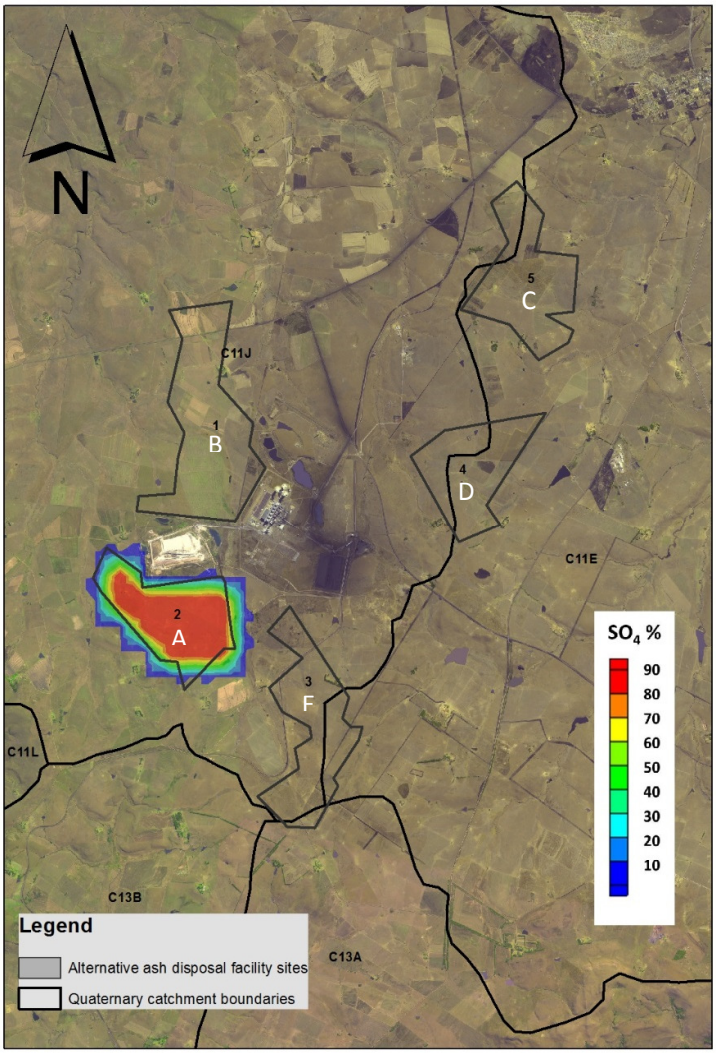

Figure 8: Modelled impact on groundwater plume five years after deposition starts. Assuming impact on the entire footprint without lining (SLR, 2013).

Based on the model it is therefore expected that the potential impacts associated with the ash disposal facilities on groundwater quality are:

- Likely to occur;
- Localised within the site boundaries if surface run-off is contained;
- Long-term, within the site boundaries beyond closure;
- The intensity of the impact is likely to be deterioration in the ambient groundwater quality close to the relevant ash disposal facility site or combination of sites as indicated in Figure 8.

The primary way to mitigate these impacts is to maintain the ash disposal facility in good condition (especially the drainage system).

Table 5: Summary of impacts on water by disposing on Alternative A as identified during the EIA phase with and without the proposed mitigation

Potential Impact	Mitigation	Significance: Ash disposal facility – Site A
GEOLOGY		
GROUNDWATER		
Deterioration of groundwater quality due to leachate from ash disposal facility	Without	**Medium**
	With	**Low**
Rise in local water table due to additional recharge caused by ash deposition and possible concentration of recharge	Without	**Medium**
	With	**Low**
Groundwater contamination in local area due to infiltration from surface water polluted by the ash disposal facility.	Without	**Low**
	With	**Low**
Change in local groundwater flow directions due to possible rise in local water table	Without	**Low**
	With	**Low**
No change to groundwater conditions at the site	Without	
	With	
SURFACE WATER		
Impacts on hydrology and subsequent loss of functional integrity of downslope wetlands	Without	**Medium**
	With	**Medium**
Impacts on surface water quality of downslope systems	Without	**High**
	With	**Medium**
Impacts associated with the surrounding catchment	Without	
	With	

Most of the identified impacts are manageable through the appropriate mitigation measures. The only impact that has been identified with high significance before mitigation was the impact on the quality of downstream systems. This impact will not be affected by the lining regime and will remain the same as assessed during the EIA. With the appropriate mitigation this impact could be reduced to medium significance.

6.4 Social Assessment

A Social Impact Assessment (SIA) was undertaken for the proposed continuous ADF EIA, at Majuba Power Station. A SIA can be described as the systematic appraisal, before the project commences, of

the potential impacts on the day-to-day quality of life of persons and communities when the environment is affected by a development.

Social impacts include all the significant changes in the social environment that take place because of the actions of a development or project, which would not otherwise have occurred. The SIA serves to identify issues that will need to be addressed by avoidance or mitigation, as well as social impacts that cannot be resolved.

Social Impacts identified for the project during the EIA phase include:

- Dust;
- Health Impacts as a result of exposure to ash
- Stable jobs; and
- More reliable supply of electricity;

In the case of the proposed continuous Majuba ash disposal facility, no communities are affected in a different way than they already are affected by the existing ash disposal facility over the many years of its existence. What this in essence means is that no measurable change or social impact is expected when Eskom continues its proposed ash disposal operations according to existing practices for the next six years as per this application.

Although there are not many potential social impacts that can occur as a result of the project (as this is a proposed continuation of an already existing waste facility), the impacts, if they do occur, will not be severe. It is, however, still imperative that mitigation measures are implemented to prevent any negative impacts from occurring.

The following mitigation measures are recommended:

- Because any health and/or social impacts that occur will be as a result of negative environmental impacts (water pollution), all potential environmental impacts need to be mitigated to minimise the effects of these impacts.
- Measures to prevent risks to people, animals and land must be put in place and adhered to.
- Water quality from boreholes is important to adjacent farmers and precautions should be taken to keep the quality to an acceptable standard.
- A zero liquid effluent discharge policy, in place, must be complied with.
- Adequate safeguards must be in place to prevent air pollution.
- Low nuisance dust levels must be maintained by means of dust suppression.
- The ash disposal facility should not be within 1.5km of any people living in the area.
- Re-vegetation of the slopes and wind breakers must be done.
- Employees must use appropriate protective clothing and/or equipment.
- All mitigation measures in EMPr and section 7 in this document must be adhered to.

7. PROPOSED MITIGATION AND MANAGEMENT MEASURES

For surface water pollution control, the existing east and west perimeter canals will be extended to allow the dirty storm water from the open ash areas to flow back to the existing pollution control dams in the North. Where this is not possible due to elevation constraints at the low point on the East side, a temporary containment dam will be provided until the permanent dam is in place. The water from this temporary containment dam will be pumped into the existing perimeter canal, from where it will gravitate back to the existing pollution control dam.

For ground water pollution control, while it will only be possible to provide the Class C plastic/clay composite liner from the point where the ash dump will be in January 2022, in the exemption period from the start of the 15-30 year area up to January 2022, the ground will be compacted, after stripping of the topsoil in order to reduce the permeability.

The EMPr for the EIA process considered the possibility of an exemption application for a temporary period up to 6 years (Transitional Arrangement) from acquisition of the IEA. The EMPr, remaining IEA and the IWUL conditions should be complied with. The onsite monitoring plan should be revised and updated to accommodate the new requirements.

Other measures that will be implemented include:

- Topsoil will be recovered from a position in front of the advancing ash face before it is covered by ash. Once stripped the topsoil shall be utilised for rehabilitation purposes.
- Ensuring that any systems for the draining of leachates and / or supernatant water from the ash disposal facility are installed correctly.
- Under-drain systems should be checked for integrity once they have been completed.
- Systems for removing or preventing blockages (e.g. rodding eyes, water traps) must be installed correctly as blocked under-drains can cause leaks, and lead to additional groundwater pollution.
- Intensive groundwater and surface water monitoring regimes;
- All work should be supervised by a suitably qualified professional.

8. PUBLIC PARTICIPATION

A Public Participation Process (PPP) was implemented as part of this exemption application. The exemption application from lining requirements in terms of the national norms and standards for disposal of waste to landfill (R. 636) for the proposed continuous ashing at the ash disposal facility at Majuba Power Station, Mpumalanga Province was announced by means of an advertisement placed in "**The Recorder"** newspaper on **Friday, 11 September 2015** and in the "**Cosmos News"** newspaper on **Wednesday, 16 September 2015**.

Notification letters were distributed to I&APs informing them of the application, public review and comment period as well as to actively participate in the PPP.

The main activities that were undertaken as part of the PP process include:

- Print media advertisements in English, Afrikaans and Zulu were placed in "The Recorder" and "Cosmos News" newspapers to announce the Exemption Application Process. See **Appendix E**
- Key Stakeholders were contacted and informed of the application and the PP process;
- The draft exemption application motivation report was made available for review at the following public venues:
  - Amersfoort Library
  - Perdekop Library
  - Volksrust Library
  - Vukuzakhe Library
  - Majuba Power Station; and on
  - Lidwala SA Website
- Project **Site notices** were erected as per the NEMA EIA Regulations at the Majuba Power Station, and distributed to neighbouring I&AP's.

A **30 calendar day** commenting period (**16 September 2015** to **16 October 2015**) was allowed for I&APs to comment on the Draft Exemption Application Motivation Report. No comments were received during this public review period.

21 calendar day commenting period will be allowed for I&APs to comment on the Final Exemption Application Motivation Report. All registered I&APs will be informed of the availability of the Final Exemption Application Motivation Report for public comment and review.

The relevant key commenting authorities for this application, are DWS, MDEDET, DAFF, DMR, DM and LM. These authorities are required to review the exemption application and provide comments to enable the Competent Authority to make a decision.

9. CONCLUSION

The relatively low permeability of the underlying rocks and the dry ash disposal technique have resulted in the additional recharge of potentially contaminated water being limited, and that potential contaminant plumes are confined to the immediate vicinity (<100 meters) of the ash disposal sites.

It is predicted that the mostly localised impacts on surface water and groundwater currently experienced will continue for the duration in which ash disposal occurs on an unlined facility.

The groundwater model referred to in this report did not account for a liner in an attempt to illustrate a worst case scenario. The model is therefore a good reflection of the plume migration in the unlined state. Table 5 shows that the groundwater specialist consider the (current/unlined) impacts mostly insignificant during the operational phase (considered the phase with the highest level of impacts).

Current monitoring results indicate that the existing ash disposal facility has impacted upon the water quality of both the shallow and deeper aquifer system, however, the plume is localised in the vicinity below and around (<100 meters), the current ash disposal facility, and the existing surface water dams which contain water from the ADF. It has also been shown that the infiltration is assumed to be low

as a result of the geology of the area. All of the above are physical factors that might reduce the expected Environmental impacts during the concession period.

In practice the current status quo and level of deterioration on the site will be maintained until such time that the liner can be integrated in the operations. For the interim it is crucial that all possible mitigation measures (Section 7 of this report & EMPr) are implemented and maintained to their full extent, at least until the liner is in place.

It is important to emphasise that there are no Environmental benefits in granting this exemption. The predicted environmental costs described above will be in line with the existing status quo. In the absence of a more acceptable triple bottom line alternative it is the opinion of the EAP that the Social and Economic advantages of allowing ashing to continue for the next six years outweigh the Environmental cost described above.

The continuous running of Majuba Power Station ensures that workers at the Majuba Power Station will keep their jobs. This in essence means that there will not be any negative impacts on the local economy or society.

The granting of this application will also ensure that Eskom (Majuba Power station) continue to supply electricity to the national grid. This is of high importance especially with the national grid currently being under tremendous pressure. This application will therefore prevent any additional negative impacts on the national economy.

10. REFERENCES

Lidwala Consulting Engineers (SA) (Pty) Ltd (2014) Environmental Impact Assessment for the proposed continuous ashing at the Majuba Power Station, EIA Report

SLR Global Environmental Solutions (2014) Proposed Continuous Ash Disposal at Majuba Power Station, Groundwater Specialist Study, SLR Project No.: 721.23003.00014, Report No.: 2, Revision No. 1

Ecotone Freshwater Consultants (2014) Proposed Continuous Ash Disposal Facility at the Majuba Power Station, Aquatic Specialist Study, Environmental Impact Assessment, Final