

**Environmental Impact Assessment for
the Proposed Continuous Ashing at the
Tutuka Power Station, Mpumalanga
Province**

FINAL SCOPING REPORT



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EXECUTIVE SUMMARY

1 INTRODUCTION

1.1 Project Background

Eskom's core business is the generation, transmission and distribution of electricity throughout South Africa. Electricity by its nature cannot be stored and must be used as it is generated. Therefore electricity is generated according to supply-demand requirements. The reliable provision of electricity by Eskom is critical to industrial development and other poverty alleviation initiatives in the country.

If Eskom is to meet its mandate and commitment to supply the ever-increasing needs of end-users in South Africa, one of Eskom's options is to extend the life of its infrastructure of generation capacity and transmission and distribution powerlines.

Tutuka Power Station, a coal fired power generation facility commissioned between 1985 – 1990, is located 25 km North of Standerton in the province of Mpumalanga. Tutuka Power Station currently disposes of ash in a dry (20% moisture content) form by means of conveyors, spreader and a stacker system from the station terrace to the Ash Disposal site. The ash disposal site covers an area of 2500 ha (Existing & Remaining ash disposal facility & pollution control canals) and is located approximately 4.5 km east of the station terrace.

Ideally, Tutuka Power Station, envisages the continuation of dry ash disposal over Eskom owned land, which was purchased before the commencement of environmental laws, the Environment Conservation Act, in particular. As part of its planning processes, Eskom developed designs which were approved internally, during this time. With the promulgation of the environmental laws, and the National Environmental Management Waste Act, Act 59 of 2008, in particular, Eskom would like to pro-actively align its continued ashing activities with the requirements of the waste licensing processes.

1.2 Description of the Study Area

Tutuka Power Station is located approximately 25 km northnortheast (NNE) of Standerton in the Mpumalanga Province. The power station falls within the Lekwa Local Municipality which falls within the Gert Sibande District Municipality.

The proposed study area, utilised in the screening study, is within an 8 km radius of the centre point of the Tutuka Power Station Site (**Figure 1. and 2**). A greater part of the study area is made up of agricultural, mining and power generation activities.



Figure 1: Tutuka Power Station forms the centre point of the study area, as the source of ash

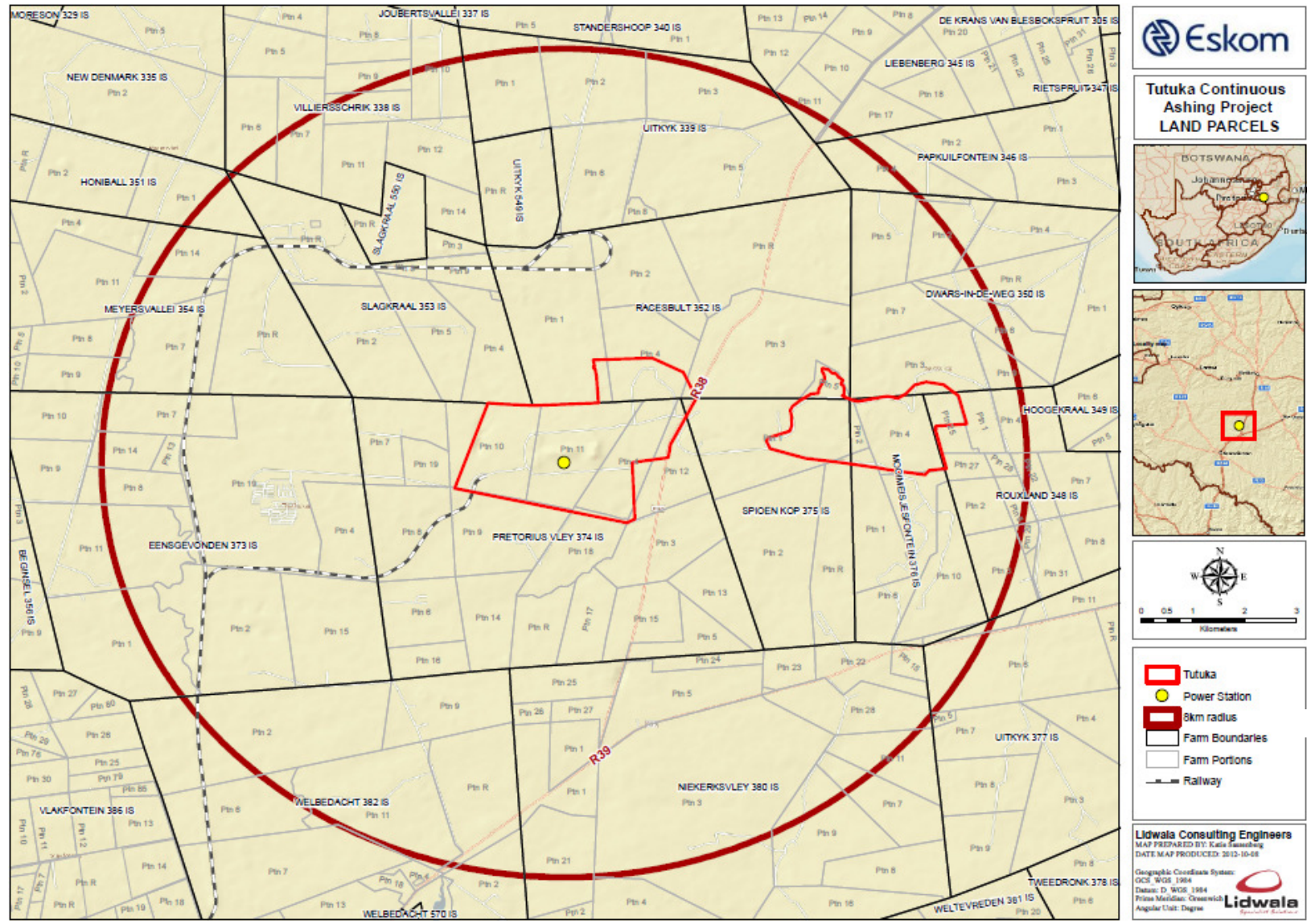


Figure 2: The greater study area

2 PROCESS TO DATE

The Environmental Impact Assessment (EIA) process for the proposed continuous ashing project is comprised of two main phases, namely the Scoping phase and Impact Assessment phase. This report documents the tasks which have been undertaken as part of the Scoping phase of the EIA. These tasks include the public participation process and the documentation of the issues which have been identified as a result of these activities.

To date, tasks that have commenced include the:

- Identification of stakeholders or I&APs;
- Notification and advertisements;
- Background Information Documents; and
- Ongoing consultation and engagement

The Draft Scoping Report was released for public review and comment from **8 November 2012 to 7 December 2012**. During the review period a public participation process (PPP) was undertaken, allowing Interested and Affected Parties (I&APs) to engage with the project proponents and independent environmental consultants. The PPP consisted of a public meeting as well as one-on-one and Focus Group interactions where required. Issues raised by I&APs during the public participation process have been documented and included in the Final Scoping Report.

The relevant authorities required to review the proposed project and provide an Environmental Authorisation were consulted from the outset of this study, and have been engaged throughout the project process. The National Department of Environmental Affairs (DEA) is the competent authority for this Project. The Department of Water Affairs (DWA), and the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET) are noted as key commenting authorities.

The Scoping Phase of an EIA serves to define the scope of the detailed assessment of the potential impacts of a proposed project. The Environmental Scoping Phase has been undertaken in accordance with the requirements of sections 24 and 24D of the National Environmental Management Act (NEMA) (Act 108 of 1998), as read with Government Notices R 543 of the 2010 EIA Regulations. The objectives of the Scoping Phase are to:

- Ensure that the process is open and transparent and involves the Authorities, proponent and stakeholders;
- Identify the important characteristics of the affected environment;
- Ensure that feasible alternatives are identified and selected for further assessment;
- Assess and determine possible impacts of the proposed project on the biophysical and socio-economic environment and associated mitigation measures; and
- Ensure compliance with the relevant legislation.

3 SUMMARY OF THE LEGISLATION CONTEXT

The legislative framework applicable to this project is diverse and consists of a number of Acts, Regulations and Treaties which must be complied with. A summary of the key legislation is provided hereunder.

- National Environmental Management: Waste Act No 59 of 2008
- The National Environmental Management: Air Quality Act No 39 of 2004;
- National Water Act No 36 of 1998;
- GN R1179 (GG 16536 of 25 August 1995) – Hazardous Chemical Substances Regulations promulgated in terms of the Occupational Health and Safety Act No 85 of 1993;
- Hazardous Substances Act No 15 of 1973
- Constitution of South Africa, Act 108 of 1996 (with reference to noise)
- Explosives Act No 26 of 1956 and Regulation 1604 of 8 September 1972;
- National Environmental Management Act No 107 of 1998 (with reference to noise and prevention of pollution)
- National Environmental Management: Biodiversity Act No 10 of 2004 (in respect of Fauna, Flora and National Heritage Resources)
- Conservation of Agricultural Resources Act No 43 of 1989 (in respect of Fauna, Flora and National Heritage Resources)
- National Forest Act No 84 of 1998 (in respect of protected trees)
- National Veld and Forest Fire Act No 101 of 1998
- National Heritage Resources Act No 25 of 1999
- Promotion of Access to Information Act No 2 of 2000 (in respect of record-keeping and interested and affected parties and monitoring of environmental impacts)

A full legal review will be undertaken during the EIA phase of the project.

4 DESCRIPTION OF THE BASELINE ENVIRONMENT

The particular area required for the continuous ashing facility is approximately 759 ha, which is located on the eastern and southern portion of the existing Tutuka Power Station ash disposal facility. However, in order to allow for a robust environmental process, all land within a radius of 8 km was assessed in order to identify potential alternatives sites should sensitive environmental aspects limit the suitability of this particular portion of land. The Tutuka Continuous Ashing EIA study area is therefore located within an eight (8) kilometre radius around a centre point which is the Tutuka Power Station. The study area is approximately 200 square kilometres in size and includes a total of 24 different farms divided into 128 farm portions.

The study area is characterised by the strong undulating character typical of the Mpumalanga province with low ridges east of the study area. The natural topography of

the area has been disturbed as a result of various agricultural and power generation activities.

The climate in the study area can be described as typical highveld conditions with summers that are moderate and wet, while winters are cold and dry. Severe frost and snow are sometimes experienced. The area also falls within the mist belt. The mean annual precipitation is approximately 580 mm/year, with rain experienced predominantly in the summer months (October to April). Annual average maximum, minimum and mean temperatures for the site are given as 31.5°C, 0.9°C and 15.3°C, respectively. The prevailing wind direction is recorded as being eastsoutheasterly winds.

Tutuka Power Station and surrounding area (8km radius) is underlain by rocks of Permian to Jurassic age. More specifically:

- Permian Ecca Group - Vryheid Formation;
- Karoo Supergroup – Karoo Dolerite.

The study site corresponds to the Grassland Biome as defined by Mucina & Rutherford (VegMap, 2006). This unit is found in the eastern, precipitation-rich regions of the Highveld. Grasslands of these parts are regarded 'sour grasslands'. The vegetation of the study area corresponds to an ecological type known as Soweto Highveld Grassland.

The study area considered in the screening and scoping phases encompasses an 8 km radius around the current infrastructure, and falls over three quaternary catchments in the Upper Vaal Water Management Area (WMA), with the Tutuka Power Station located in the C11K quaternary catchment, draining southwards towards the Grootdraai Dam via the Leeuspruit. The study area is located in an Upstream Management Catchment (NFEPA – Nel et al., 2011). According to the MBCP (Ferrar & Lötter, 2007) the study area is located in an 'Ecosystem Maintenance' sub-catchment. The main rivers in the 8 km radius of the Tutuka Power Station include a tributary of the Leeuspruit and a tributary of the Vaal River.

The DWA 1:500 000 scale hydrogeology map of the area (Sheet 2526 Johannesburg) shows that the area within an 8 km radius of the Tutuka site is entirely classified as "D2", suggesting the underlying aquifer is inter-granular and fractured and the average borehole yield ranges between 0.1 and 0.5 litres per second (L/s). There are no major groundwater abstractions shown on the hydrogeological map within 8 km of the site.

5 PROJECT ALTERNATIVES

- *No-Go Alternative*

Ideally, Tutuka Power Station envisages the continuation of dry ash disposal over Eskom owned land, which was purchased before the commencement of environmental laws, the

Environment Conservation Act, in particular. As part of its planning processes, Eskom developed designs which were approved internally, during this time. With the promulgation of the environmental laws, and the National Environmental Management Waste Act, Act 59 of 2008, in particular, Eskom would like to align its continued ashing activities with the requirements of the waste licensing processes.

The need for this project is to allow the Tutuka Power Station to continue ashing in an environmentally responsible and legally compliant manner for the duration of the operating life of the Power Station.

In the event that the continuous ashing project does not proceed either the power station will run out of land to legally dispose of its ash and the power station will ultimately be required to close down, which would contribute negatively to the provision of reliable base load power to the national grid or the power station will be required to dispose of its ash in a non-compliant manner which is contrary to Eskom's policies.

Even though the no-go alternative is considered to be unfeasible, the 'no go' alternative will, still be investigated further in the EIA phase as an alternative as required by the EIA Regulations.

- *Technical Alternatives*

Due to the fact that Tutuka Power Station utilises a dry ashing disposal method, it stands to reason that in order to continue ashing a dry ashing method should still be utilised.

A further technical alternative to limit the need for ash disposal facilities includes the use of higher grade coal which would reduce the amount of ash produced in the power generation process. The power station was originally designed for 35 years and now its life time is extended to 60 years. The boilers are designed to use a specific grade of coal and the boiler plant would require a redesign for higher grade coal. In order for this alternative to be implemented would require the complete redesign and reconstruction of the power station. The combination of the costs involved in the reconstruction of the power station as well as the higher price of the higher grade coal would have a knock on effect in terms of the country's electricity prices. Therefore, this alternative is therefore not considered feasible.

- *Location Alternatives*

A screening study was initiated in order to assess where potential alternative sites are located within the study area that would be suitable for use for the proposed continuous ashing project. The study area was demarcated using an 8 km radius around the Tutuka Power Station.

In order to ensure that sites are identified in the most objective manner possible, a sensitivity mapping exercise was undertaken for the study area. The purpose of such an exercise was to identify suitable areas within the study area that could accommodate the proposed ash disposal facility and associated infrastructure and to pro-actively identify sensitive areas (i.e. fatal flaws) that should be avoided.

Figure 3 shows the final sensitivity map that was utilised to identify the alternative sites (**Figure 4**) that require more detailed studies.

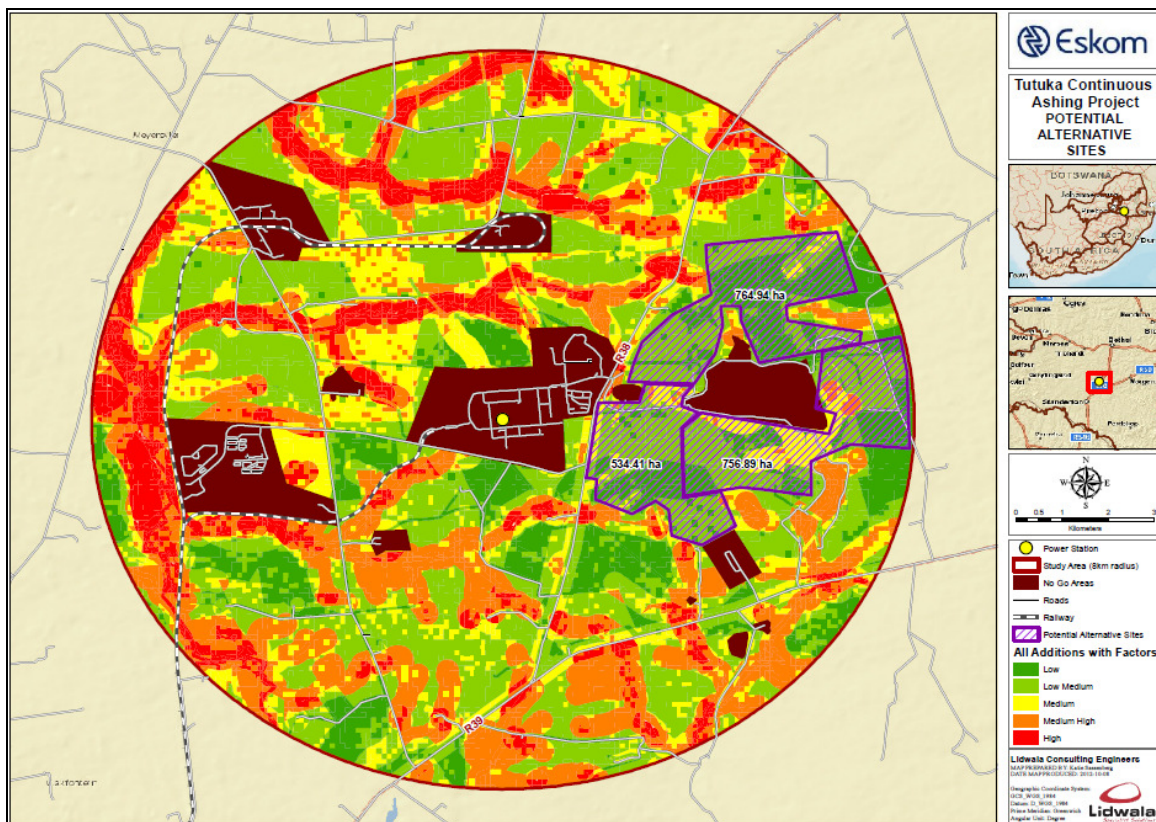


Figure 3: Potential alternative sites available for the ash disposal facility

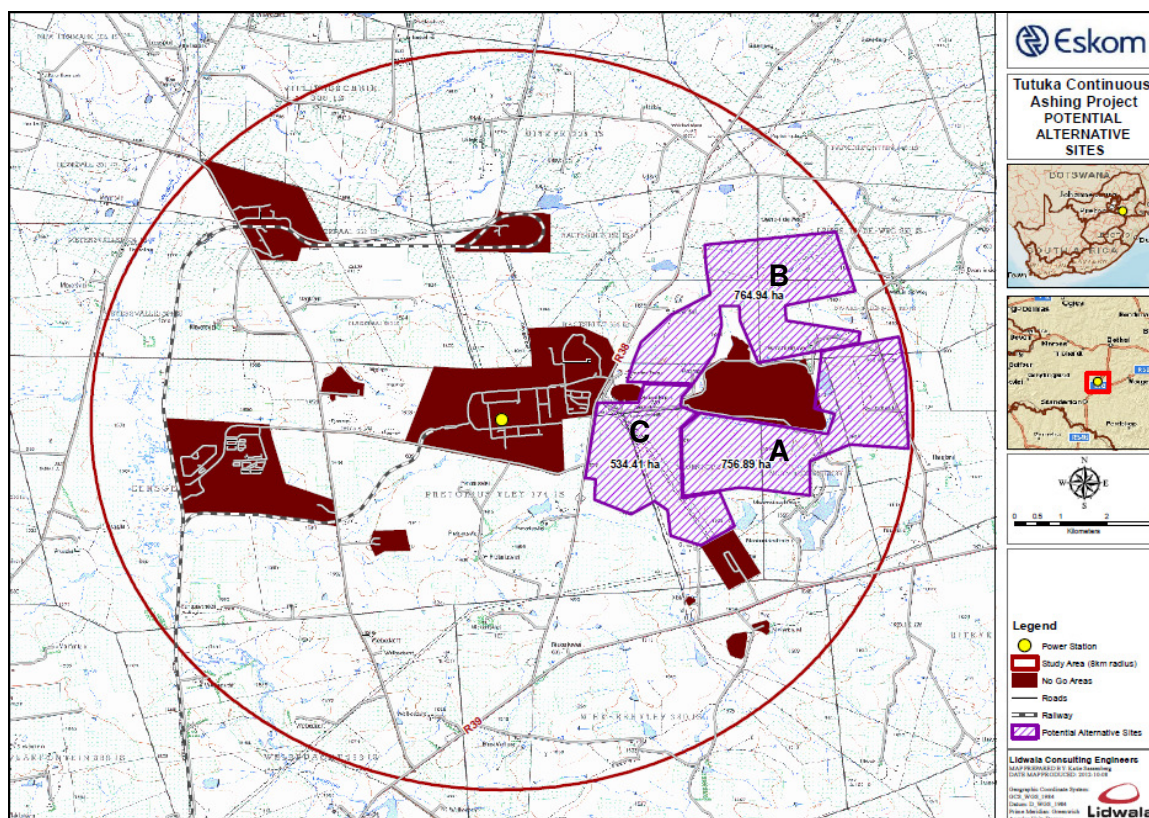


Figure 4: The Alternative sites for further consideration during the EIA Phase

6 FINDINGS OF THE IDENTIFICATION OF IMPACTS

The following impacts have been identified for additional study during the EIA phase and are deemed to be issues of potentially **medium to high significance** or those anticipated to require specific mitigation measures:

• Biophysical Impacts

- Geology
 - Impacts related to the construction-related earthworks
 - Impacts related to the pollution in case of spillage/leakage of hydrocarbon and other hazardous material from storage facilities
- Groundwater
 - Contamination of ground water due to hydrocarbon spillage and seepage into groundwater reserves, affecting groundwater quality.
 - Further construction of infrastructure and compaction of the area will further contribute to reduced water infiltration rates to replenish groundwater aquifers.
- Soil and agricultural potential
 - Pollution of soil due to handling, use and storage of hazardous substances during construction and operation.
 - The loss of available top soil.

- Key variables that determine the land capability of the study area such as soil fertility reduced and disturbed due to the potential activities related to the ash disposal facility.
- The loss of viable agricultural land.
- Avifauna
 - Ash disposal facility
 - Destruction of habitat and disturbance of birds
 - Associated Infrastructure such as powerlines
 - Electrocutions
 - Collisions
 - Habitat destruction
 - Disturbance
- Surface Water
 - Impacts on surface water quality;
 - Impacts on hydrology;
 - Impacts related to erosion and sedimentation;
 - Impacts on aquatic biota; and
 - Impacts on aquatic ecosystem services.
- Biodiversity
 - Direct impacts on threatened flora species;
 - Direct impacts on protected flora species;
 - Direct impacts on threatened faunal taxa;
 - Direct impacts on common fauna species/ faunal assemblages (including migration patterns, corridors, etc.);
 - Human - Animal conflicts;
 - Loss or degradation of natural vegetation/ pristine habitat (including ecosystem functioning);
 - Loss/ degradation of surrounding habitat;
 - Impacts on SA's conservation obligations & targets;
 - Increase in local and regional fragmentation/ isolation of habitat; and
 - Increase in environmental degradation, pollution (air, soils, surface water)..
- **Social Impacts**
 - Air Quality
 - Increase in dust generating activities during construction and operation including exceedances of PM10 concentrations and exceedances of dustfall rates.
 - Visual
 - Impact on the current visual landscape.
 - Impact on sensitive receptors,
 - Heritage
 - identify the potential heritage sites within the study area

- identify any impacts (if any) that may occur on these sites as a result of the continuous ashing project
- Socio-Economic
 - Perceptions and fears associated with the proposed project; and
 - Local, site-specific issues.

The above mentioned impacts will be investigated in more detail during the EIA phase of the project.

7 CONCLUSIONS AND RECOMMENDATIONS

A number of potentially significance environmental impacts have been identified as requiring some more in-depth investigation and the identification of detailed mitigation measures. Although the impacts identified are of a potentially significant nature they would not prohibit the project from continuing at this stage of the process

Therefore, a detailed Environmental Impact Assessment is required to be undertaken in order to provide an assessment of these potential impacts and recommend appropriate mitigation measures, where required.

The recommendation of this report is that detailed specialist studies are undertaken on the three identified alternative sites and the no-go alternative

Eskom Holdings SOC Limited

**Environmental Impact Assessment for the Proposed Continuous Ashing at the
Tutuka Power Station, Mpumalanga Province**

Final Scoping Report

TABLE OF CONTENTS

<u>Item</u>	<u>Description</u>	<u>Page No.</u>
	Document Description	
	Executive Summary	
	Table of Contents	
1.	INTRODUCTION	1-1
1.1	Need and Justification	1-2
1.2	Project Background	1-2
1.3	Summary of EIA Process	1-3
1.3.1	<i>EIA Process</i>	1-3
1.3.2	<i>Application Process</i>	1-3
1.3.3	<i>Scoping Phase</i>	1-5
1.3.4	<i>EIA or Assessment Phase</i>	1-7
1.4	Way Forward	1-8
2.	DETAILS OF ROLE PLAYERS	2-1
2.1	Introduction	2-1
2.2	Details of Applicant	2-1
2.3	Details of Independent Environmental Assessment Practitioner	2-1
2.4	Details of Competent / Relevant Authority	2-4
2.5	Details of Commenting Authorities	2-4
3.	EIA PROCESS AND METHODOLOGY	3-1
3.1	Introduction	3-1
3.2	Authority Consultation	3-1
3.2.1	<i>Consultation with Authorities</i>	3-1
3.2.2	<i>Consultation with other Relevant Authorities</i>	3-2
3.3	Environmental Scoping Study	3-2
3.3.1	<i>Overview of the Public Participation Process</i>	3-2
3.3.2	<i>Public Review of the Draft Environmental Scoping Report</i>	3-8
3.3.3	<i>Final Environmental Scoping Report</i>	3-9
3.4	Conclusion	3-9
4.	PROJECT DESCRIPTION	4-1
4.1	Introduction	4-1
4.2	Location of the proposed Site for Expansion	4-2
4.3	Detailed Description of the Project	4-4
4.4	Associated Infrastructure	4-5

4.4.1	<i>Upgrade of Emergency Ashing Area (TT02)</i>	4-5
5.	LEGISLATIVE CONTEXT	5-1
5.1	Introduction	5-1
5.2	Legal Review	5-3
5.2.1	<i>Atmospheric Pollution</i>	5-3
5.2.2	<i>Waste Management</i>	5-3
5.2.3	<i>Hazardous Substances</i>	5-4
5.2.4	<i>Water Consumption and Disposal</i>	5-5
5.2.5	<i>Noise</i>	5-6
5.2.6	<i>Fauna, Flora and National Heritage Resources</i>	5-6
5.2.7	<i>Planning of new activities</i>	5-7
5.2.8	<i>General Obligations</i>	5-12
5.3	Specific Legislation highlighted through the Specialist Studies	5-13
5.3.1	<i>Heritage</i>	5-13
5.3.2	<i>Biodiversity (including Surface water and Avifauna)</i>	5-14
5.4	Policy and Planning Context	5-16
5.4.1	<i>White Paper on the Energy Policy of the Republic of South Africa</i>	5-16
5.4.2	<i>Energy Security Master Plan – Electricity (2007-2025)</i>	5-17
5.4.3	<i>National Spacial Biodiversity Assessment ("NSBA")</i>	5-18
5.4.4	<i>Draft National Strategy for Sustainable Development</i>	5-18
6	DESCRIPTION OF BASELINE ENVIRONMENT	6-1
6.1	Introduction	6-1
6.2	Study Area in Regional Context	6-1
6.2.1	<i>Locality</i>	6-1
6.2.2	<i>Study Area</i>	6-2
6.3	Description of the Baseline Environment	6-7
6.3.1	<i>Topography</i>	6-7
6.3.2	<i>Climate</i>	6-7
6.3.3	<i>Geology</i>	6-9
6.3.4	<i>Land Cover and Land Use</i>	6-10
6.3.5	<i>Land Type</i>	6-12
6.3.6	<i>Natural Vegetation</i>	6-13
6.3.7	<i>Animal Life</i>	6-15
6.3.8	<i>Avifauna</i>	6-19
6.3.9	<i>Surface Water</i>	6-26
6.3.10	<i>Ground Water</i>	6-35
6.3.11	<i>Site of Archaeological, Historical and Cultural Interest</i>	6-37
6.3.12	<i>Visual Impacts</i>	6-39
6.3.13	<i>Ambient Air Quality</i>	6-42
6.3.14	<i>Social Environment</i>	6-43
7.	PROJECT ALTERNATIVES	7-1
7.1	Introduction	7-1
7.2	The 'No-go' Alternative	7-1
7.3	Technical Alternatives	7-2
7.4	Location Alternatives	7-3
7.4.1	<i>Screening Analysis and Methodology</i>	7-6

7.4.2	<i>Specialist Study Screening Results</i>	7-13
7.4.3	<i>Final Screening Results</i>	7-23
7.5	Conclusion	7-27
8.	IDENTIFICATION OF POTENTIAL IMPACTS	8-1
8.1	Introduction	8-1
8.2	Identification of Potential Biophysical Impacts	8-1
8.2.1	<i>Geology and Geohydrology</i>	8-1
8.2.2	<i>Soil and Agricultural Potential</i>	8-1
8.2.3	<i>Avifauna</i>	8-2
8.2.4	<i>Surface Water</i>	8-4
8.2.5	<i>Biodiversity</i>	8-10
8.3	Identification of Potential Social Impacts	8-16
8.3.1	<i>Visual</i>	8-16
8.3.2	<i>Air Quality</i>	8-18
8.3.3	<i>Heritage</i>	8-19
8.3.4	<i>Socio-Economic</i>	8-20
8.4	Summary of potential impacts identification during the scoping phase	8-21
9.	CONCLUSION AND RECOMMENDATIONS	9-1
10.	PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASSESSMENT	10-1
10.1	Introduction	10-1
10.1.1	<i>Project Background</i>	10-1
10.1.2	<i>Purpose of the Plan of study for EIA</i>	10-1
10.1.3	<i>Details of Applicant</i>	10-2
10.1.4	<i>Details of Environmental Assessment Practitioner</i>	10-3
10.1.5	<i>Details of Authorities</i>	10-3
10.2	Summary of Project Description	10-3
10.3	Summary of the Legislation Context	10-6
10.4	Summary of the Scoping Phase	10-6
10.4.1	<i>Description of the Study Area</i>	10-6
10.4.2	<i>Description of the Baseline Environment</i>	10-9
10.4.3	<i>Summary of Alternatives</i>	10-10
10.4.4	<i>Summary of Public Participation to date</i>	10-12
10.5	Description of Environmental Issues identified during Scoping	10-13
10.6	Impact Assessment Phase	10-15
10.6.1	<i>Introduction</i>	10-15
10.6.2	<i>Decision-Making Framework</i>	10-15
10.6.3	<i>Impact Assessment Methodology</i>	10-16
10.6.4	<i>Public Participation Process (PPP)</i>	10-18
10.6.5	<i>Consultation with DEA</i>	10-19
10.6.6	<i>Terms of Reference for Specialist Studies</i>	10-19
10.6.7	<i>Requirements for Waste License Report</i>	10-32
10.6.8	<i>Proposed Project Programme for the EIA</i>	10-33
10.7	Conclusions and Recommendations	10-33

LIST OF TABLES

- Table 2.1:** Details of Applicant
- Table 2.2:** Details for the Tutuka Power Station
- Table 2.3:** Details of the Environmental Assessment Practitioner
- Table 2.4:** Details of relevant competent authority – DEA
- Table 2.5:** Details of the commenting authorities – MDEDET
- Table 2.6:** Details of the commenting authorities - DWA
- Table 3.1:** Date on which the adverts were published
- Table 3.2:** Public and Focus Group Meetings held during DESR Review Period
- Table 3.3:** Public Meeting and DSR availability adverts to be placed
- Table 5.1:** Legislation taken into account during biodiversity studies
- Table 6.1:** Farm Portions situated within the Tutuka Continuous Ashing EIA Study Area
- Table 6.2:** Farm Portions associated with the Eskom’s proposed Continuous Ashing Area
- Table 6.3:** Protected plant species within the region of the study area
- Table 6.4:** Red Data assessment for the study area
- Table 6.5:** Protected species of Mpumalanga
- Table 6.6:** Red Data species report rates for the two quarter degree squares which cover the study area-SABAP 1 (Harrison et al, 1997)
- Table 6.7:** Report rates from Southern African Bird Atlas Project 2 (SABAP2) as of 09/10/2012.
- Table 6.8:** Desktop characterisation of the main rivers in the 8 km radius of the study area.
- Table 6.9:** Reconciliation of requirements and available water for the year 2000 (million m³/a) without yield of Mohale Dam (DWA, 2004)
- Table 6.10:** Historical water quality for two DWA monitoring sites on the Leuspruit (C11K)
- Table 6.11:** Macroinvertebrate species expected to occur, or indicating the possibility of occurrence, in the different sub-quadernary reaches located within the study area. Taxa in red are considered sensitive taxa
- Table 6.12:** Fish species expected to occur, or indicating the possibility of occurrence, in the river systems located within the 8 km radius
- Table 6.13:** General Hydrogeology Map classification of South Africa
- Table 6.14:** Summary of the GRA2 Data
- Table 6.15:** Measured daily ambient PM₁₀ concentrations at Eskom’s Grootdrraidam monitoring station for the period 2009 to 2011
- Table 6.16:** Ward Population Numbers
- Table 6.17:** Lekwa Settlement Summary
- Table 7.1:** Description of the various categories used in the sensitivity mapping
- Table 7.2:** Specialist and Lidwala Project Team ratings
- Table 7.3:** Client ratings
- Table 7.4:** Combined ratings
- Table 8.1:** Preliminary ratings of the hydrological benefits likely to be provided by wetlands (Kotze et al., 2009)

Table 8.2: Activities and aspects identified for the construction, operational and rehabilitation phases of the proposed operations

Table 10.1: Details of the applicant

Table 10.2: Details of the Environmental Assessment Practitioner

Table 10.3: Details of the relevant authorities

Table 10.4: Development approvals, Authorisations and Permits required for the Proposed Project

Table 10.5: List of Specialist Studies

LIST OF FIGURES

Figure 1.1: Location of Tutuka Power Station within the Lekwa Local Municipality

Figure 1.2: Environmental Impact Assessment Process for an Integrated Application

Figure 3.1: Tutuka Power Station

Figure 3.2: Tutuka Power Station Ash Disposal Site (Entrance)

Figure 3.3: Standerton Public Library

Figure 3.4: Die Plaas Slaguis

Figure 3.5: Standerton Library

Figure 3.6: Tutuka Power Station reception

Figure 4.1: An overview of the activities on site and where this project fits within the power generation process

Figure 4.2: Tutuka Power Station forms the centre point of the study area

Figure 4.3: The greater study area

Figure 4.4: The ash disposal facility layout as currently constructed and the footprint of the proposed future extent of the facility

Figure 4.5: The location of the emergency ashing area (TT02) within the Tutuka Power Station Terrace area

Figure 6.1: Location of Tutuka Power Station within the Lekwa Local Municipality

Figure 6.2: Location of Lekwa Local Municipality within the Gert Sibande District Municipality

Figure 6.3: Tutuka Continuous Ashing EIA Study Area (indicating both the power station and the existing ashing area)

Figure 6.4: The location of Eskom's proposed continuous ashing site within the demarcated study area

Figure 6.5: The monthly rainfall as measured at the Grootdraaidam monitoring site during the period August 2011 to July 2012

Figure 6.6: Average monthly maximum, minimum and mean temperatures measured at the Grootdraaidam monitoring site

Figure 6.7: Period, day-time and night-time wind roses for the Tutuka Power Station

Figure 6.8: Geology of the Study area

Figure 6.9: Land cover categories for the study area

Figure 6.10: Land type units with the study area

Figure 6.11: The MBCP categories as they relate to the study area.

Figure 6.12: Agricultural lands observed in the study area.

- Figure 6.13:** One of four Marsh Owls observed in close vicinity to each other, foraging over agricultural lands in the study area.
- Figure 6.14:** Grassland observed in the broader study area.
- Figure 6.15:** Burnt grasslands observed in the study area.
- Figure 6.16:** A Rock Kestrel perches, while foraging over grassland in the study area.
- Figure 6.17:** The Endangered Botha's Lark may occur in grasslands in the study area.
- Figure 6.18:** A typical man-made farm dam, as observed in the study area.
- Figure 6.19:** This drainage line in the study area contained water, which appeared to be dammed by a tar road.
- Figure 6.20:** A stand of alien trees in the study area.
- Figure 6.21:** Tutuka Power Station, DWA monitoring points and main rivers located in the 8 km radius of the proposed Ash disposal facility (Nel et al., 2004; Chief Directorate – Surveys and Mapping, 2629; SANBI, 2010).
- Figure 6.22:** Map indicating the study area in relation to NFEPAs (Nel et al., 2004; SANBI, 2010; Nel et al., 2011).
- Figure 6.23:** Map indicating the study area in relation to the MBCP (Nel et al., 2004; Ferrar & Lötter, 2007).
- Figure 6.24:** Sub-quaternary catchments related to the expected macroinvertebrate species list (Chief Directorate – Surveys and Mapping, 2629; Pers.Comm. Mrs. Christa Thirion, 2012).
- Figure 6.25:** An overview of the hydrogeology of the study area.
- Figure 6.26:** An old bridge across the Leeuspuit.
- Figure 6.27:** Integrated proximity and visual exposure index.
- Figure 6.28:** Daily measured PM₁₀ and PM_{2.5} ground level concentrations (µg/m³) at the Secunda DEA monitoring station (for the period December 2011) (as downloaded from the SAAQIS website)
- Figure 6.29:** Measured daily PM₁₀ concentrations for the Eskom Grootdraaidam monitoring station.
- Figure 6.30:** Age and Gender Profile
- Figure 7.1:** The ash disposal facility layout as currently constructed and the footprint of the proposed future extent of the facility
- Figure 7.2:** Proposed Study Area within which potential alternative sites were to be identified
- Figure 7.3:** An example of typical layer integration process
- Figure 7.4:** String array parts and resultant indice calculations: max wins; sensitivity rating as is and sensitivity with an applied factor.
- Figure 7.5:** No-go Areas Layer
- Figure 7.6:** Biodiversity Sensitivity Map
- Figure 7.7:** Surface Water Sensitivity Map
- Figure 7.8:** Groundwater sensitivity map
- Figure 7.9:** Avifauna Sensitivity Map
- Figure 7.10:** Agricultural Potential Sensitivity Map
- Figure 7.11:** Location of possible sensitive receptor areas, i.e. farmsteads and roads.
- Figure 7.12:** Social Sensitivity Map

Figure 7.13: Air Quality Sensitivity Map

Figure 7.14: Overall Environmental Sensitivity (Max Wins)

Figure 7.15: Overall Environmental Sensitivity (no factor)

Figure 7.16: Overall Environmental Sensitivity (with adjustment factor)

Figure 7.17: The potential areas, within the study area, large enough to accommodate the required area for the ash disposal facility (overlain on sensitivity map).

Figure 7.18: The three potential suitable alternative sites that can be evaluated and assessed in the EIA studies (overlain on 1 in 50 000 topographic map).

Figure 8.1: Integrated proximity and visual exposure index.

Figure 10.1: The ash disposal facility layout as currently constructed and the footprint of the proposed future extent of the facility.

Figure 10.2: The location of the emergency ashing area (TT02) within the Tutuka Power Station Terrace area

Figure 10.3: Tutuka Power Station forms the centre point of the study area, as the source of ash

Figure 10.4: The greater study area

Figure 10.5: Potential alternative sites available for the ash disposal facility

Figure 10.6: The Alternative sites for further consideration during the EIA Phase

LIST OF APPENDICES

Appendix A: Application Form

Appendix B: Acknowledgement of Receipt of Application

Appendix C: Curricula Vitae of Project Team

Appendix D: I&AP Database

Appendix E: Comment and Response Report

Appendix F: Site Notices

Appendix G: Advertisements

Appendix H: Background Information Document

Appendix I: Biodiversity Specialist Study

Appendix J: Avifauna Specialist Study

Appendix K: Surface Water Specialist Study

Appendix L: Ground Water Specialist Report

Appendix M: Heritage Specialist Report

Appendix N: Visual Impact Specialist Report

Appendix O: Air Quality Specialist Report

Appendix P: Public Meeting

Appendix Q: Landowner Focus Group Meeting

Appendix R: Lekwa Local Municipality Focus Group Meeting

Appendix S: Key Stakeholder Workshop