

## **7 PROJECT ALTERNATIVES**

### **7.1 Introduction**

In terms of the EIA Regulations published in Government Notice R543 of 2 August 2010 in terms of Section 24 of the National Environmental Management Act (Act No. 107 of 1998), feasible and reasonable alternatives have to be considered within the Environmental Scoping Study, including the 'No Go' option. All identified, feasible and reasonable alternatives are required to be identified in terms of social, biophysical, economic and technical factors.

A key challenge of the EIA process is the consideration of alternatives<sup>1</sup>. Most guidelines use terms such as 'reasonable', 'practicable', 'feasible' or 'viable' to define the range of alternatives that should be considered. Essentially there are two types of alternatives:

- incrementally different (modifications) alternatives to the Project; and
- fundamentally (totally) different alternatives to the Project.

Fundamentally different alternatives are usually assessed at a strategic level, and EIA practitioners recognise the limitations of project-specific EIAs to address fundamentally different alternatives.

### **7.2 The 'no go' alternative**

The 'no go' alternative is the option of not proceeding with the continuous ashing project at Tutuka Power Station.

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 poverty alleviation in the country.

Tutuka Power Station envisages the continuation of dry ash disposal over Eskom owned land, ideally, 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

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<sup>1</sup> In terms of the EIA Regulations published in Government Notice R543 of 2 August 2010 in terms of Section 24 (5) of the National Environmental Management Act (Act No. 107 of 1998), the definition of "alternatives" in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity which may include alternatives to: (a) the property on which or location where it is proposed to undertake the activity; (b) the type of activity to be undertaken; (c) the design or layout of the activity; (d) the technology to be used in the activity; (e) the operational aspects of the activity and (f) the option of not implementing the activity.

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.

The need for this project is to allow 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, and the country's plans.

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.

### **7.3 Technical Alternatives**

The coal-fired power generation process results in large quantities of ash, which is disposed of in an ash disposal facility. Generally, Eskom has access to, and uses, coal of a low grade (called middlings coal) which produces a larger mass of ash during combustion. Over time, the quality of the coal provided to Eskom has degraded, due to higher ash quantities in the coal. The Tutuka Power Station utilises a dry ashing disposal method.

The waste product is deposited onto the disposal site by means of a stacker, which handles some 85% of the total ash whilst the remaining 15% is placed by a standby spreader system.

As the ash disposal progresses from west to east, the two extendible conveyors will be extended to its final lengths of 4 000 m each. The ash disposal facility is built out in two layers. The front stack is deposited by the stacker and spreader to a height of approximately 45 m. The ash is bulldozed out to a slope of 1:3 for dust suppression and rehabilitation purposes. The stacker then moves around the head – end of the shiftable conveyor to dump another 20 m high back stack. The total ash disposal facility height is then approximately 65 m.

As the ash disposal advances, the topsoil is stripped ahead of the activities and is taken by truck and placed on top of the final ash disposal facility height. Grass is then planted in this top soil.

The existing ash disposal facility has the required dirty and clean water channels and the clean storm water flows to the north and south clean water dams. The dirty water flows to the south settling dam and then to the south dirty water dam.

Due to the fact that Tutuka Power Station utilises 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.

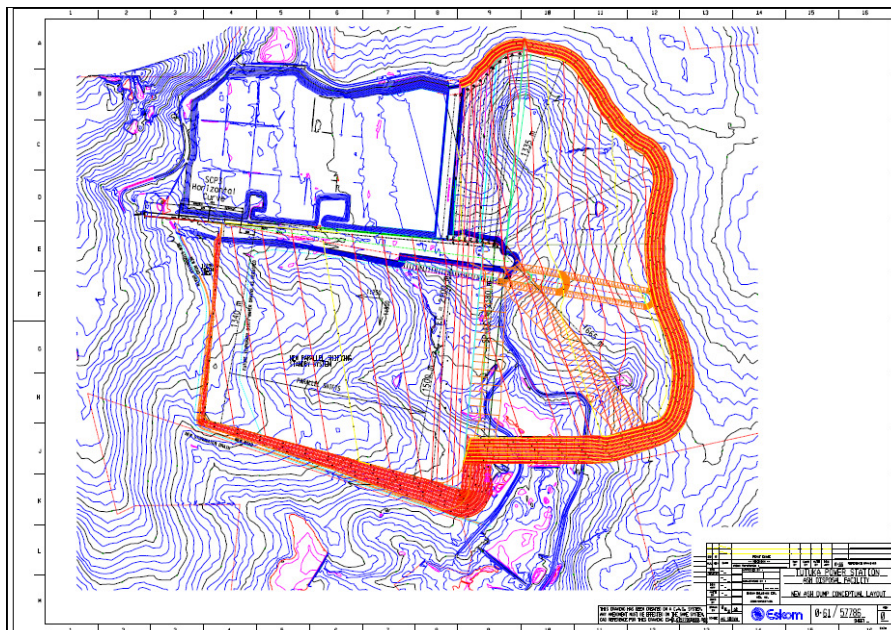
#### **7.4 Location Alternatives**

Tutuka Power Station is located approximately 25 km north-north-east (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 continuous development is an ash disposal facility with the following specifications:

- Capacity of airspace of 353,1 million m<sup>3</sup> (Existing and remaining); and
- Ground footprint of 2 500 Ha (Existing & Remaining ash disposal facility & pollution control canals)

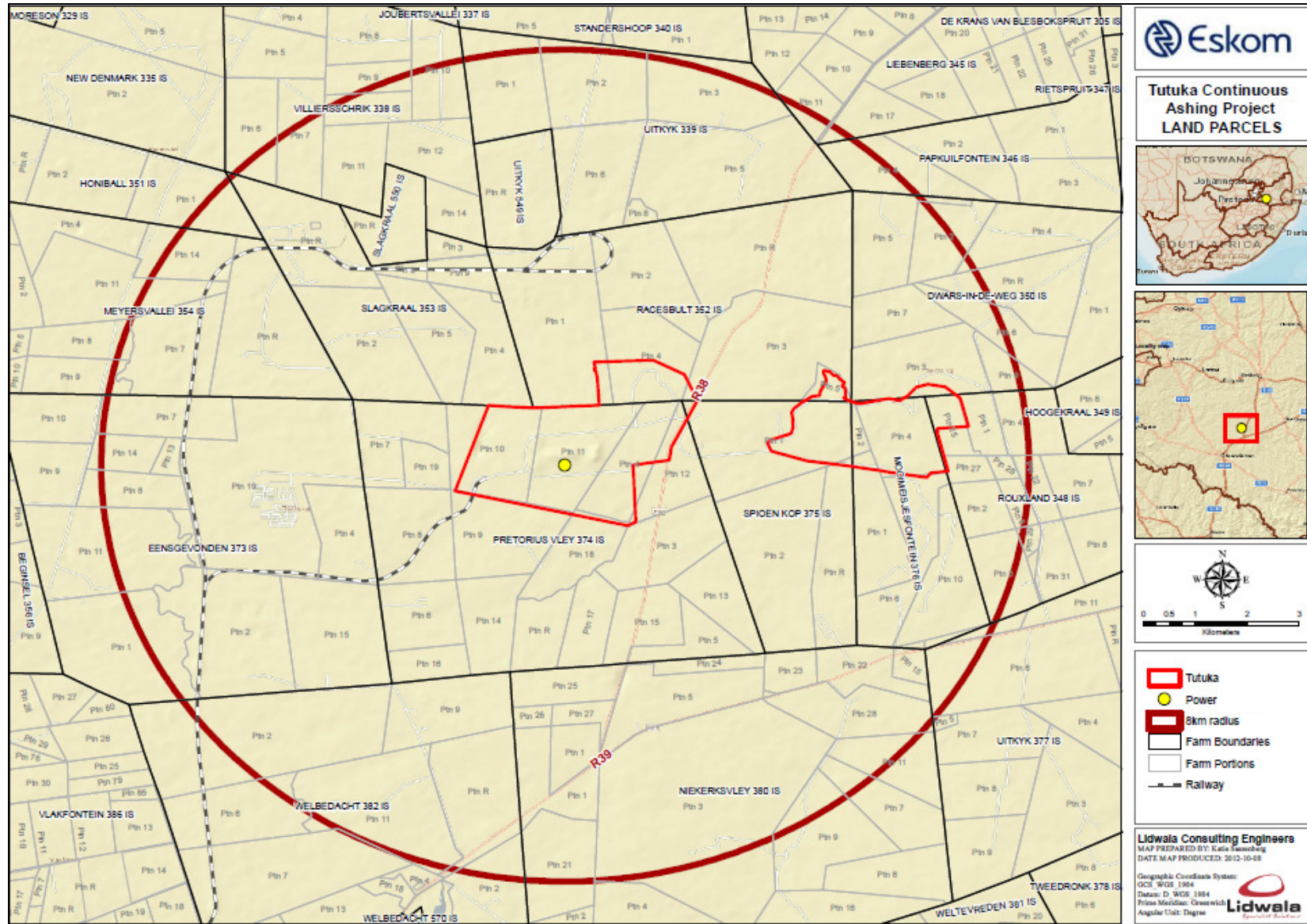
**Figure 7.1** below illustrates the ash disposal facility layout as currently constructed (blue) and outlines the footprint of the proposed future extent of the facility (orange), which is also the Eskom land identified and purchased for ashing.



**Figure 7.1:** The ash disposal facility layout as currently constructed and the footprint of the proposed future extent of the facility

The particular area required for the continuous ashing facility is approximately 759ha, 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, while taking Eskom's proposed site into consideration, all land within a radius of 8 km was assessed in order to identify potential alternatives sites should any sensitive environmental aspects limit the suitability of Eskom's proposed site/land. The Tutuka Continuous Ashing EIA study area is therefore located within an 8 km radius around the source of ash at Tutuka Power Station (**Figure 7.2**).



**Figure 7.2:** Proposed Study Area within which potential alternative sites were to be identified