5 METHOD STATEMENT

The implementation and collation of detailed biodiversity knowledge of the site and region for the purpose of this project is not negotiable to the ultimate success of this project. Therefore, an attempt was made to remove any subjective opinions that might be held on any part of the study area as far as possible. Inherent characteristics of a project of this nature implies that no method will be foolproof, mainly as a result of shortcomings in available databases and lack of site specific detail that could be obtained from limited detailed site investigations conducted over a short period of time. It is an unfortunate fact that inherent sensitivities within certain areas will inevitably exist; these portions of information cannot always be captured or illustrated during a brief EIA process. This is a limitation of every scientific study; it simply is not possible to know everything or to consider aspects to a molecular level of detail. However, the approach followed in this study is considered effective in presenting objective comments on the comparison of biodiversity sensitivity of parts in the study area.

In order to present an objective opinion of biodiversity sensitivities of the study area and how this relates to the suitability/ unsuitability of any area within the site in terms of the proposed development, all opinions and statements presented in this document are based on the following aspects, namely:

- A desk-top assessment of all available biological and biophysical data;
- Augmentation of existing knowledge by means of site specific and detailed field surveys;
- Specialist interpretation of available data, or known sensitivities of certain regional attributes; and
- An objective scoping assessment, estimating potential impacts on biological and biophysical attributes.

In assessing the suitability of land within the proposed 8km radius, a blanket approach of transformation vs. natural habitat cannot be applied throughout the assessment. Certain areas of existing transformation are therefore excluded from the assessment, such as residential areas, Tutuka Power Station and the existing ash disposal facility. Recommended alternatives are therefore based on suitable options as far as biodiversity attributes are concerned.

While existing info bases (ENPAT, Google Earth, POSA, etc.) are implemented in the identification of suitable alternatives, recommendations/ proposed site alternatives are also heavily influenced by known biodiversity attributes. New information becomes available through recent documentations and historic surveys conducted in the region. Every effort will be made to implement available information in order to derive suitable recommendations. It should be noted that the mandate of this assessment is to consider the ecological/ biodiversity sensitivity of the receiving environment; financial and technical implications are not considered as it is addressed as a separate assessment.

5.1 Assessment Philosophy

The objective of the scoping phase study is to collate and review as much existing floristic and faunal information of the study area and the surrounds as possible in order to identify sensitive areas that should preferably be avoided during development and to guide the proposed activity towards less sensitive areas in terms of ecological attributes.

The overall goal of this scoping assessment is to establish a reference point for the biophysical and ecological attributes and sensitivities of the study area by means of the Ecosystem Approach Principles and the Landscape Ecology Approach. These approaches are advocated by the Convention on Biological Diversity (www.cbd.int), recognizing that people and biodiversity are part of the broader ecosystems on which they depend, and that it should thus be assessed in an integrated way. Effective conservation of landscape heterogeneity (sensitive habitat types/ ecosystems frequently associated with biodiversity elements of high sensitivity or conservation importance) will effectively result in the conservation/ protection of species that are highly sensitive to changes in the environment.

It is inevitable that this approach will not function effectively in all cases since extremely localised and small areas of sensitivity might occur scattered in any region and cannot always be captured on available databases or might have been missed during the initial site investigations (www.umass.edu/landeco/about/landeco.pdf). Therefore, the compilation of basic species lists from available infobases and the identification of localised habitat types by means of a brief site investigation will be implemented to augment initial results. It is important to identify areas of sensitivity on a local scale and, where possible, communities or species of conservation importance, that could potentially be affected by influences arising from the proposed development. The Precautionary Principal is applied throughout the assessment[1].

Thus, the general approach adopted for this type of study is to identify any biodiversity issues that may lead to:

- the decision that the proposed project cannot take place, i.e. to specifically focus on red flags and/or potential fatal flaws; or
- where the proposed development protocol needs to be adapted to allow for the protection of biodiversity aspects of sensitivity.

5.2 Method Statement - Botanical Assessment

The botanical assessment was compiled by R. A. J. Robbeson (Pr.Sci.Nat.).

5.2.1 General Botanical Attributes

In preparation for the site survey, physiognomic homogenous units are identified and delineated on digital aerial photos, using standard aerial photo techniques. Images are downloaded from www.googleearth.com and georectified in Arcview 3.2. A brief site visit was conducted to examine the general floristic attributes and diversity of the study area and the development alternatives. Objectives of this particular investigation included the identification of preliminary habitat types and estimating preliminary sensitivities thereof. These

[1] (www.pprinciple.net/the_precautionary_principle.html).

preliminary sensitivity observations will ultimately be relayed to recommendations made to the proposed project.

5.2.2 Flora Species of Conservation Importance

The purpose of listing Red Data plant species is firstly to provide information on the potential occurrence of species of special concern in the study area that may be affected by the proposed development. Secondly, the potential occurrence of these species can then be assessed in terms of their habitat requirements in order to determine whether they have a likelihood of occurring in habitats that may be affected by the proposed infrastructure. Red Listed flora information, as presented by SANBI was used as a point of departure for this assessment. A snapshot investigation of an area, such as this particular investigation, represents a severe limitation in terms of locating and identification of potential Red Listed flora species. Particular emphasis is therefore placed on the identification and assessment of habitat deemed suitable for the potential presence of Red Listed.

It should be noted that Red List species are, by nature, usually rare and difficult to locate. Compiling a list of species that could potentially occur in an area is furthermore limited by the paucity of collection records that make it difficult to predict whether a species may occur in an area or not. Notwithstanding the application of the Precautionary Principle, there is always the likelihood that a species that is not included in a list might be unexpectedly present in an area.

5.3 Method Statement - Faunal Assessment

The faunal assessment was compiled by D. Kamffer (Pr.Sci.Nat.).

5.3.1 Ecological Status

The extent to which a site is ecologically connected to surrounding areas is an important determinant of its sensitivity. Systems with a high degree of landscape connectivity or with extensive grassland and drainage systems amongst one another are perceived to be more sensitive and will be those contributing to important faunal sensitivity or overall preservation of faunal diversity. A basic site investigation will reveal the current ecological status of available habitat types. A preliminary assessment will be presented in this report, but will ultimately be canvassed during the EIA phase of the project. A major objective of this part of the project is to identify areas that are regarded important on a local or regional scale that are likely to have a bearing on the project.

5.3.2 Red Listed Fauna Probabilities

Three parameters are used to assess the Probability of Occurrence of Red Listed species that could potentially occur in the study area:

- Habitat requirements (HR) - Red Listed animals have specific habitat requirements and the presence of these habitat characteristics in the study area is evaluated.
- Habitat status (HS) - The status or ecological condition of available habitat in the study area is assessed. Often, a high level of degradation of a specific habitat type will negate the potential presence of Red Listed species (especially wetland-related habitats where water quality plays a major role); and

- Habitat linkage (HL) - Movement between areas used for breeding and feeding purposes forms an essential part of ecological existence of many species. The connectivity of the study area to surrounding habitats and adequacy of these linkages are evaluated for the ecological functioning of Red Listed species within the study area.

5.4 Ecological Sensitivity

The aim of this exercise is to present an opinion on the inherent ecological sensitivity of macro habitat type of the study area. These issues are assessed by documenting whether any important biodiversity features occur on site, including species, ecosystems or processes that maintain ecosystems and/or species. These can be organised in a hierarchical fashion, as follows:

- Threatened and/or Protected:
  - plant species;
  - animal species;
  - ecosystems;
- Critical conservation areas, including:
  - areas of high biodiversity;
  - centres of endemism;
- Important Ecological Processes, including:
  - Corridors;
  - Mega-conservancy networks;
  - Rivers and wetlands; and
  - Important topographical features.

High Sensitivity Values indicate areas that are considered pristine, unaffected by human influences or generally managed in an ecological effective manner. These areas are comparable to nature reserves and even well managed farm areas. Low Sensitivity Index Values indicate areas of lower ecological status or importance in terms of vegetation attributes, or areas that have been negatively affected by human impacts or poor management. Sensitivity Criteria employed in assessing the sensitivity of separate units may vary between different areas, depending on location, type of habitat, size, etc. In addition, estimation of the importance or sensitivity of a specific site, the type of development that is planned for the area is also taken into consideration. The measure of invasion or habitat destruction that will result from the proposed activity is therefore likely to affect the level of sensitivity attributed to a site.

6 PROJECT ALTERNATIVES

A technically feasible site has been indicated, situated directly south and east of the existing ashing facility. However, in order to allow for a robust process, all land within a radius of 8km are included in this assessment in order to identify potential alternatives sites should a potential for significant adverse negative impacts be identified on the proposed site that renders the site not suitable in terms of ecological sensitivity.

7 BACKGROUND TO GRASSLAND ECOLOGY

From: Mpumalanga Biodiversity Conservation Plan Handbook (2007).

Grassland defines itself: landscapes dominated by grass. Although grasses are the most visible plants, grasslands are frequently characterised by a higher diversity of herbs and forbs, especially those with belowground storage organs such as bulbs or tubers. These plants produce many of our spectacular wild flowers and contribute to a species richness that is second only to that of the Cape Fynbos. The large number of rare and endangered species in grasslands is a particular problem for environmental impact assessments. They are mostly small, very localised and visible for only a few weeks in the year when they flower. Most surveys will not pick them up and special skills are required to locate and identify them reliably. The highest biodiversity is found in rocky grassland habitats and on sandy soils, while biodiversity tends to be lower in areas dominated by clay soils.

The grassland biome contains some of the most threatened vegetation types in South Africa. It is estimated that 60 to 80% of South African grasslands have already been irreversibly transformed by agriculture, forestry, urban and industrial development and mining. An alarmingly low 2% of the remaining pockets of pristine grasslands – areas of surprisingly high plant and animal diversity – are formally under conservation in 142 publicly owned nature reserves. On the positive side, by correlation of the geographic distribution, the 3,378 plant species found in the grassland biome, and the distribution of these nature reserves, it is estimated that 78% of these species are indeed represented in conservation areas.

Large parts of our grasslands occur on deep fertile soils of high agricultural value and much of this landscape has therefore already been converted to crops, timber or intensive animal production. Grasslands originally covered 61% of Mpumalanga, but 44% of this is already transformed. This substantial and irreversible reduction of the biome is due mainly to cultivation, especially industrial scale agriculture and timber growing. These land uses destroy biodiversity but extensive livestock grazing can be reasonably biodiversity-friendly, provided good management and safe stocking rates are applied. While timber growing is mainly restricted to grasslands, its impact is not limited to the plantation “footprint”. It significantly reduces surface and underground water and causes the spread of some of the most damaging alien species. These effects, along with flammability of its tree species and the fire protection measures required, also substantially change the fire regime in grasslands.

Most plants are perennials and surprisingly long lived, with very few annual species, which are the pioneer plants needed to repair disturbance. This makes our grasslands vulnerable to destruction by cultivation; once ploughed they are invaded by alien and weedy pioneer plants. Although many grassland plants do produce seed, very little germinates, most being used as vital food for their rich rodent and insect fauna. Mpumalanga grasslands are mainly found in the highveld above 1,000m. These are cool, dry and open landscapes where rainfall exceeds 500mm per annum. Frost, hailstorms and lightning strikes are common. This natural occurrence of fire and other defoliating events favour grassland plants over woody species and help maintain the open treeless character of grasslands.

Shallow-rooted vegetation is typical of the grasslands with a limited growing season of about six months of the year. The non-growing seasons are characterised by cool and dry conditions, during which time most foliage is removed or killed by frost, and dies back to ground level.