

Majuba Continuous Ashing Project

VISUAL IMPACT ASSESSMENT – DRAFT SCOPING REPORT

Produced for Lidwala Consulting by D. Jansen van Vuuren, MetroGIS.

Submitted 28 September 2012.

Revised 23 October 2012

1. INTRODUCTION

The ash disposal facilities at Majuba Power Station near Amersfoort are approaching the designed 15 year boundary. These facilities form part of a bigger area of land purchased by Eskom, onto which ashing activities will be continued. The ashing Infrastructure needs to be extended to the 60 year boundary line for continued ashing. An Environmental Impact Assessment (EIA) process is currently under way to obtain environmental authorisation for the planned continuing ashing activities. MetroGIS has been appointed by Lidwala Consulting to undertake a visual impact assessment (VIA) as part of the EIA. This document serves as a scoping report, describing the receiving environment and visual exposure of the ash disposal facilities and identifying issues with regard to visual impact. This is based on information that was supplied to MetroGIS, which includes an electronic version of the planned layout.

The regional setting puts Majuba Power Station, and all the associated infrastructure (including ash disposal facilities), at a distance of approximately 14km south-west of Amersfoort and 15km north-east of Perdekop, as indicated on the locality map in Figure 1. This places the facility in a rural context, with a specific visual character, which is further described in **Section 2**.

The study area for the VIA includes a buffer of 12km around Majuba Power Station, which is the area within which visual impacts, if any, are expected to manifest themselves.

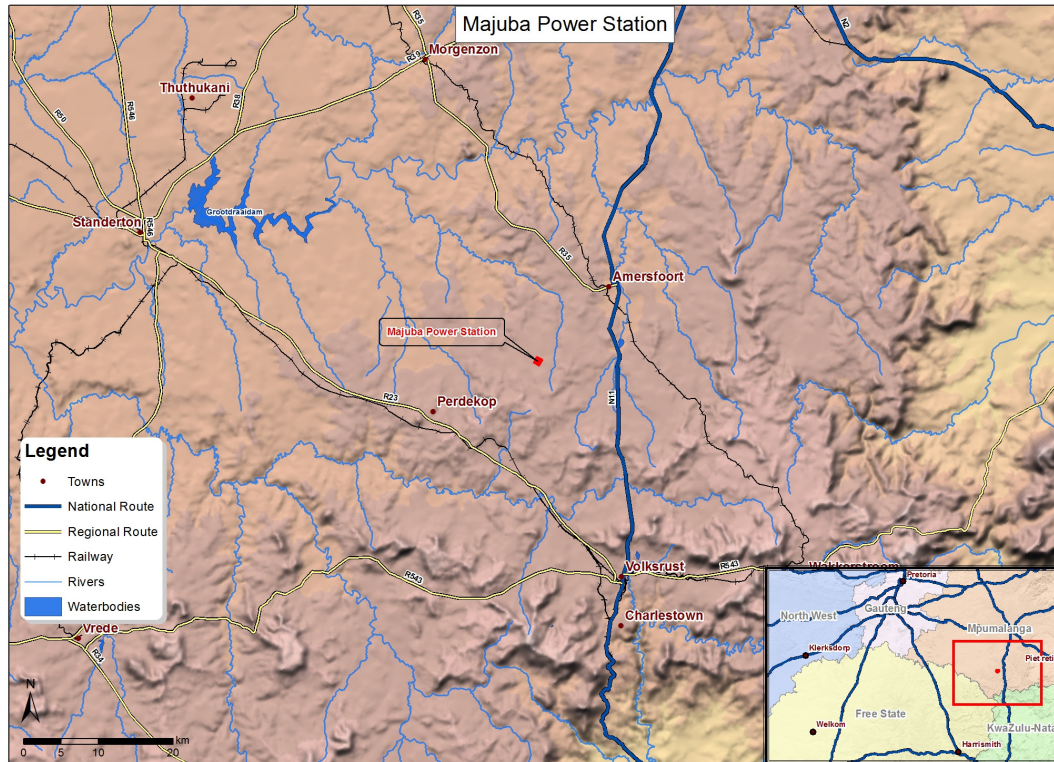


Figure 1: Locality map of Majuba Power Station.

2. LANDSCAPE CHARACTER AND SENSE OF PLACE

The character of a landscape is shaped by a combination of visual resources, including environmental elements, such as vegetation, topography, water features, and man made features signifying the way in which human activity has transformed this environment. The visual character of the Majuba Power Station and its surrounding environment is shaped by a unique combination of the following features:

- Grassland;
- An undulating topography with isolated koppies and ridges;
- Perennial and Non-Perennial streams and isolated dams;
- Cultivated land;
- The Majuba Power Station (being a visually dominant feature in the area);
- Remnants (shaft and buildings) of an old mine;
- Dispersed farmsteads, and
- Roads, including the N11 national road from Amersfoort to Volksrust, arterial routes (R23, R35) and a number of access roads to farms in the region.

The closest towns are Amersfoort and Perdekop, both of which are further than 12 km from the power station, situated beyond the zone of visual influence of the ash disposal facility.

Natural grassland, cultivated land and the Majuba Power Station are the main form giving elements in the landscape, together with farmsteads dispersed through the region. The intrinsic value of these landforms in terms of visual quality varies between **high to low**. Driving through the area creates a pleasant sense of place of the landscape, with high quality views of hills and pastures. In places where facilities such as the power station and the old mine do not dominate the view, these are absorbed as an intricate part of the landscape, by virtue of the. However, as one approaches the power station the various components, such as the ashing facilities, power lines and other infrastructure become discernable, degrading the visual quality of the landscape in general.

Based on land cover data, the landscape character can be quantified and visualised on a map. The map in **Figure 2** shows the large degree of agricultural activity in the area. The remaining natural areas are mostly confined to hilly terrain, which in itself is an important form giving element of the landscape.

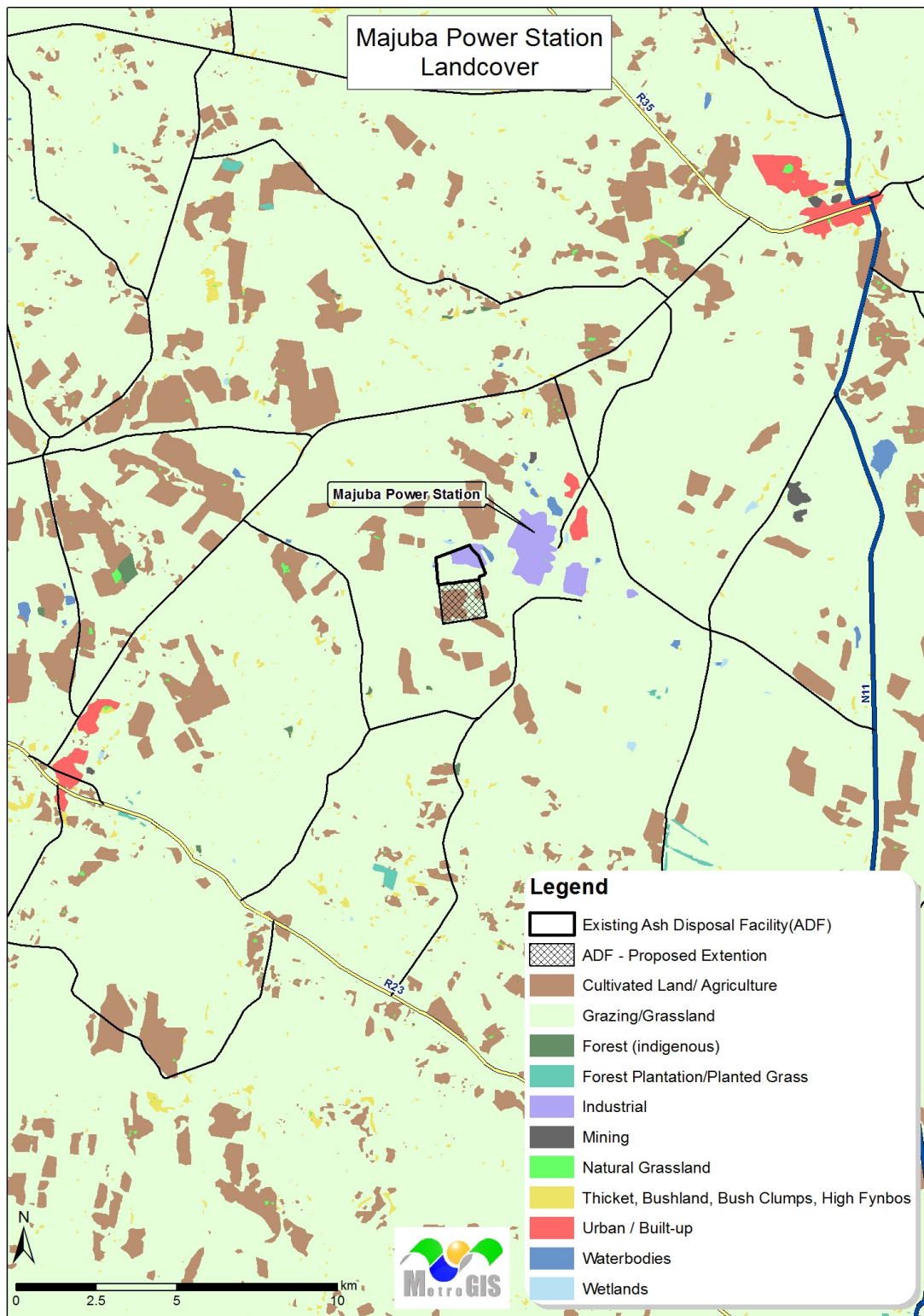


Figure 2: Land cover depicting the landscape character.

Topography

The topography is an important form giving element of the landscape. On the one hand, it opens up vast panoramic views of the landscape, and on the other hand it creates visual barriers. The topography in the study area has a strong undulating character with hills and koppies south and east of Majuba Power Station. This is significant in terms of the location of the ash disposal facilities, since the topography will be the primary factor determining the visibility and level of exposure thereof. In this regard, the screening effect of hills in the south must be noted.

Landuse

Agriculture and power generation represent the primary economic activities in the region. Cultivation (primarily maize), cattle and sheep farming constitute most of the farming activity. The power station is synonymous with different kinds of infrastructure that can be observed, *inter alia* power lines, conveyors, pipelines, and an ash disposal site. In addition, a planned underground coal gasification (UCG) project located north of the power station contains a demonstration plant, consisting of a network of pipelines.

The position of the observer, and his situational awareness in terms of the landscape as it is observed and experienced, is an important factor in determining any visual impact. This is of particular importance, given the diverse nature of the landscape, as described above. Further analysis of this aspect will be undertaken during the EIA phase.

3. SENSITIVE RECEPTORS

Sensitive receptors in the study area are associated with the occurrence of farmsteads and road users, which are widely spread across the study area. The location of these are presented on the map in **Figure 3**. The level of sensitivity is determined by proximity to the ash disposal facilities, and can be classified as follows:

- o 0 – 1.5km. Short distance view where the facility would dominate the frame of vision and constitute a very high visual prominence.
- o 1.5 - 3km. Medium distance view where the facility would be easily and comfortably visible and constitute a high to moderate visual prominence.

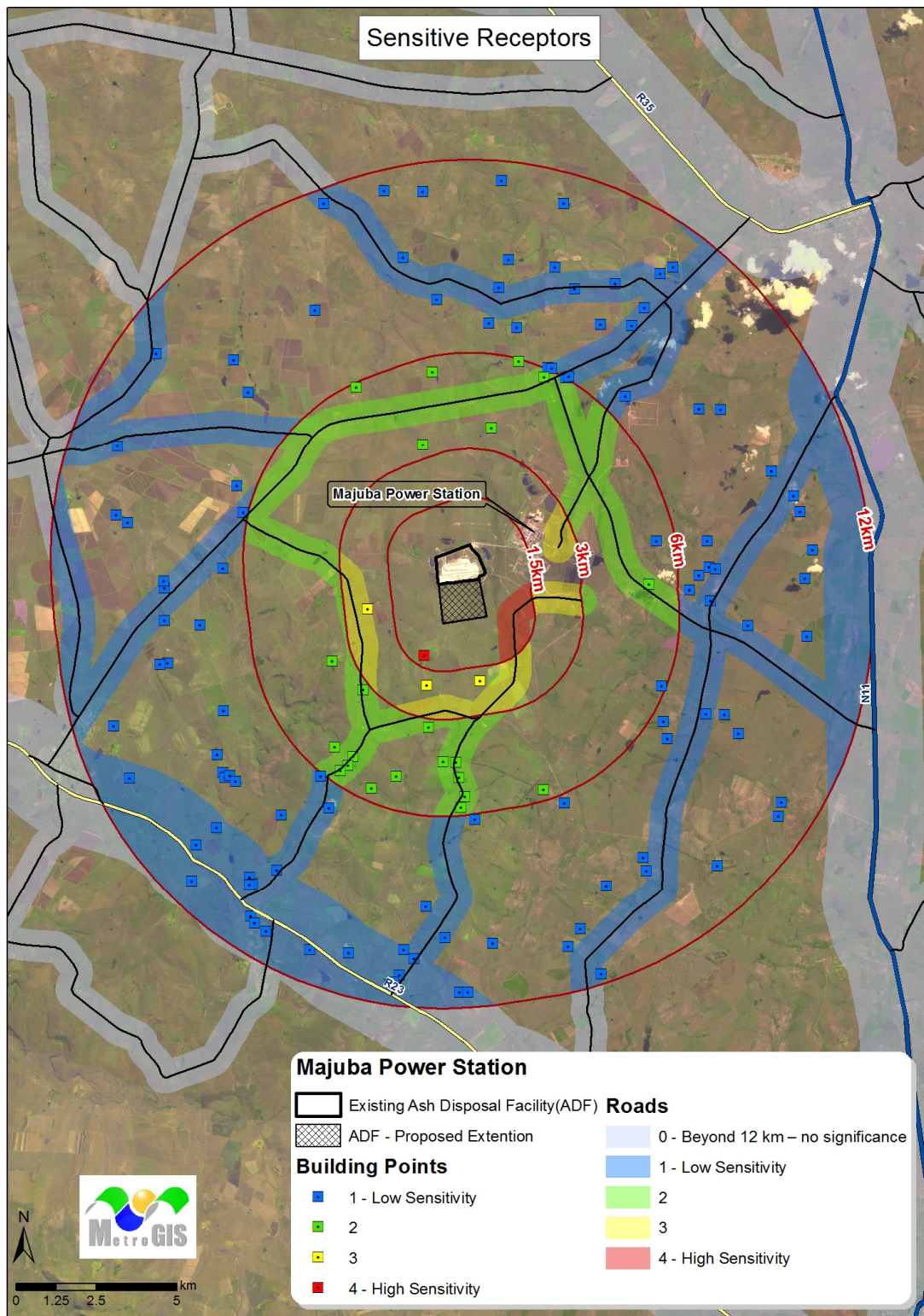


Figure 3: Location of possible sensitive receptor areas, i.e. farmsteads and roads.

o 3 - 6km. Medium to longer distance view where the facility would become part of the visual environment, but would still be visible and recognisable. This zone constitutes a moderate to low visual prominence.

- o Greater than 6km. Long distance view of the facility where it could potentially still be visible though not as easily recognisable. This zone constitutes a very low visual prominence for the facility. It is anticipated that beyond 12 km from the facility any visibility thereof would be of no significance in terms of visual impact.

4. VIEWSHED ANALYSIS: VISIBILITY AND VISUAL EXPOSURE

Visibility of an object is one of the primary attributes by which visual impact can be concluded. This is determined by a line of sight where nothing obscures the view of an object. Exposure is defined by the degree of visibility, in other words “how much” or “which part” of an object is visible to the observer. This is influenced by topography and the incidence of objects such as trees and buildings that obscure the view partially or in total. Visibility can be modelled by making use of a digital terrain model (DTM), created from contour data, and performing a viewshed analysis using GIS software. It must be noted that the viewshed analysis only accounts for topographical influences, and that the screening effect of vegetation is not included. This indicates a worst-case scenario, where the possibility of visual exposure is mapped, from which possible sensitive viewer locations can be identified.

In addition to viewshed analyses as described above, a proximity analysis is required to incorporate the effect of reduced visibility over distance. By integrating the two types of analyses, an index of possible visual impact is generated, as shown on the map in **Figure 4**.

The map indicates a core area of high visibility and a high degree of visual exposure within 3 km from the ash dam. The extension of the ash disposal facilities in a southern direction is expected to impact on a number of sensitive receptors within 3 km from the site. Permanent residents within this zone need to be identified and requirements with regard to mitigation measures investigated during the EIA phase.

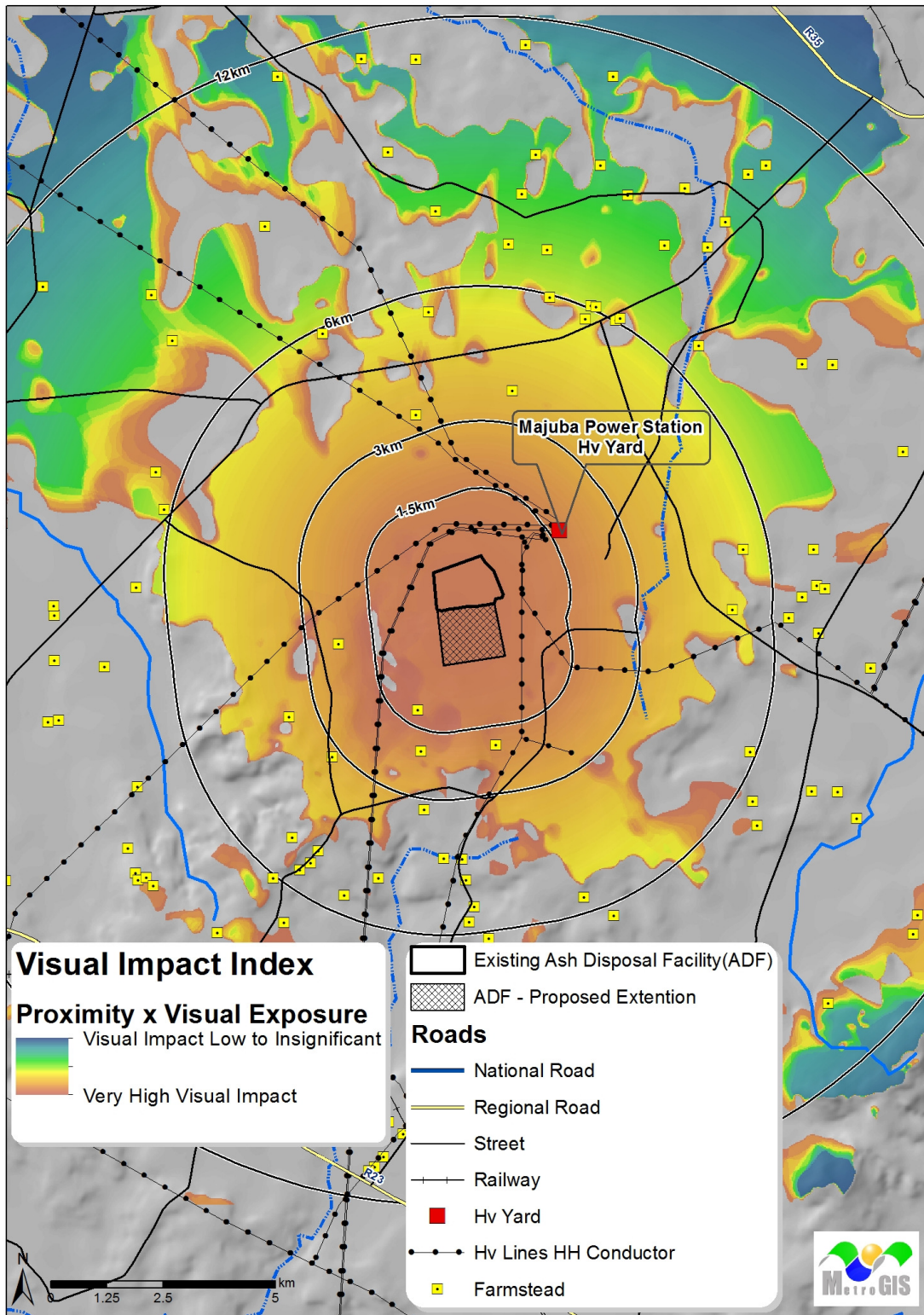


Figure 4: Integrated proximity and visual exposure index.

5. ISSUES RELATING TO VISUAL IMPACT

As a facility on its own, as well as a feature associated with the Majuba Power Station, the current ash disposal facilities form part of the current visual landscape. This provides a large degree of visual absorption capacity for the continuation of the ash disposal facilities, provided it is not segregated from its current position within the footprint of the power station at large.

A number of sensitive receptors, particularly residents on farmsteads, might be impacted upon with the southern extension of the ash dump. Issues of concern will relate to the design of the facility, particularly the footprint and vertical dimensions thereof. Whereas the above viewshed analysis was based on a conceptual design and an assumed maximum height of 70m, detailed information with regard to the design of the ash disposal facilities, together with detailed information gathered from a site visit will be used in an assessment of the nature and significance of visual impact.

6. CONCLUSION

The continuation of the ash disposal facility as planned in a southern direction, is unlikely to have any significant visual impacts. This statement is qualified in terms of the following:

- The existing ash disposal facility has been established as a landform in the landscape, and is strongly associated with the Majuba Power Station. The proposed project will result in enlargement of the existing facilities, in terms of its height and footprint, but its association with the power station will remain. Furthermore, the direction of expansion closer to a range of hills benefits from the screening effect of the topography. All things considered, the landscape provides sufficient visual absorption capacity to accommodate the planned expansion of the ash disposal facility.
- The number of sensitive receptors is small. Perceptions with regard to the extension of the ash disposal facility is anticipated to be neutral, based on the assumption that the planned activity will not be in contrast with the current landscape and that the sense of place will not be altered significantly.

It is therefore recommended that the significance of the potential visual impacts on sensitive receptors be assessed in further detail in the EIA. Additional spatial analyses must be undertaken in order to create a visual impact index that will further aid in determining potential visual impact. Mitigation measures will be suggested to minimise and / or avoid visual impacts where possible.