



Figure 6e: Ndwalane Mainline Toll Plaza Viewshed Analysis



Figure 6f: Alternative Ndwalane Mainline Toll Plaza Viewshed Analysis

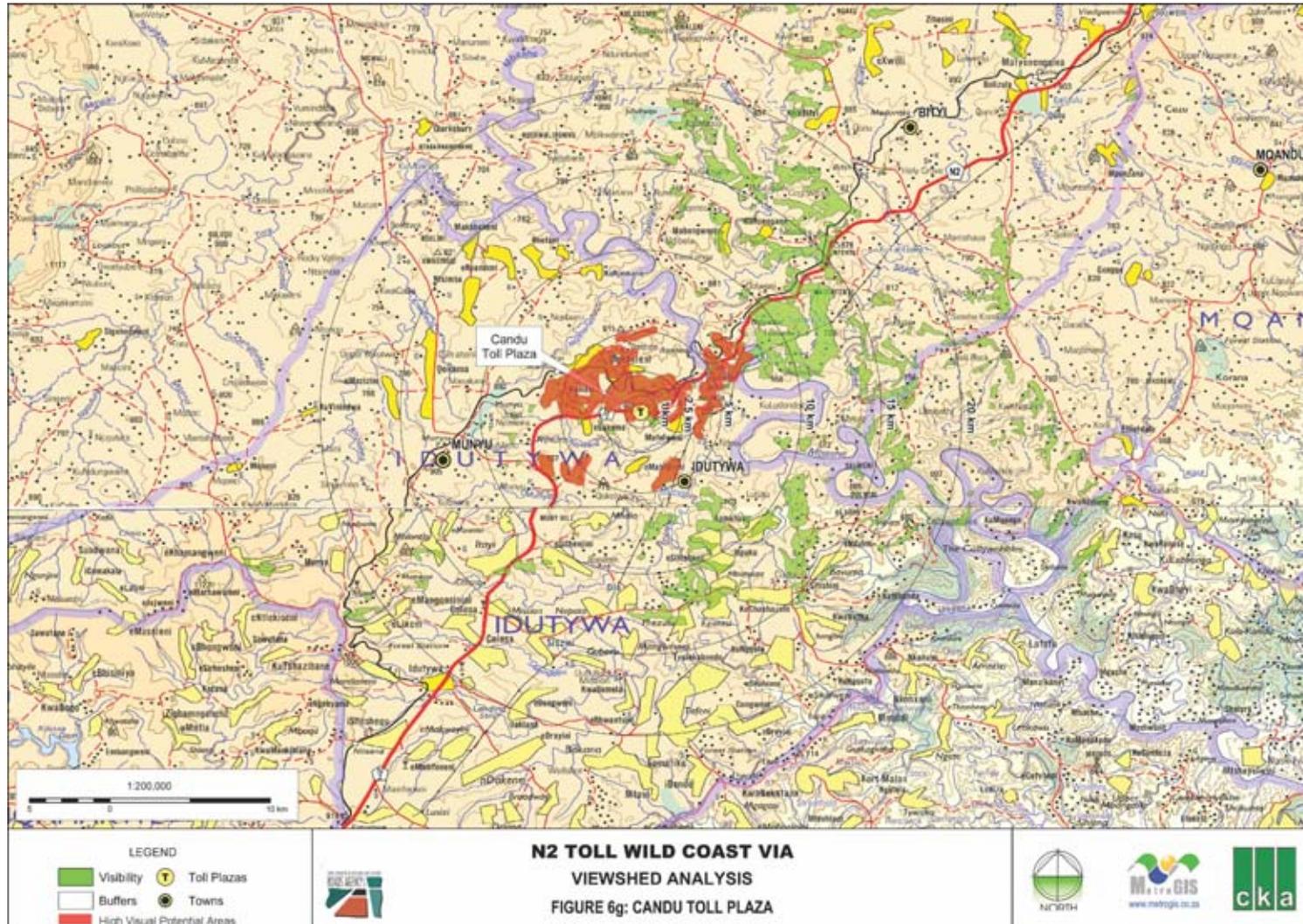


Figure 6g: Candu Mainline Toll Plaza Viewshed Analysis



Figure 6h: Ngobozi Mainline Toll Plaza Viewshed Analysis

However, the plaza will be located in a cutting that will limit the potential impact considerably. Ngobozi Toll Plaza (Photo 27) is located to the south-west of Butterworth and is visible from the north, west and south for up to 20 km affecting the surrounding urban and rural communities. Oribi Toll Plaza is an existing plaza and has not been assessed (Photo 19).

Implications for the Project

The visibility of the SANRAL Preferred Route is continuous for up to the 5 km zone and will be highly visible to the surrounding settlements and urban areas such as Lusikisiki. Due to the position in the landform the route does not impact on the critical area of the Mkambati Nature Reserve. However, it does have an impact on the scenic area of the Mateku Waterfall (1 km away) and the Msikaba River Gorge. The significance of the impact of the SANRAL Preferred Route on the receiving environment is considered low or on a scale of 1-5 a rating of 2 due to the low to moderate VAC and the existing modified landscape due to human activity and intrusion. The exception, however, is the scenic area around the Mateku Waterfall where views from the escarpment edge of the falls are seemingly undisturbed by human activity and thus the significance of the impact of the route through this area is considered high or a rating of 4 on a scale of 1-5. The impact of the SANRAL Preferred Route does not have an impact on the Mnyameni Waterfalls as those do not fall within the viewshed of the Route or the project components.

The Coastal Mzamba Route, although visible for up to 5 km to the north, is less visible to the south and the adjacent coastal plain / zone. The significance of the impact on the surrounding environment is considered less than that of the SANRAL Preferred Route and is rated as 1 on a scale of 1-5.

All the bridges occur at river crossings with a high scenic value (Photos 11 & 12). Some, such as the Msikaba (Photos 30, 33 & 34) and the Mtentu Rivers (Photos 31 & 32) are particularly scenic. It is considered that the intensity of the impact of the bridges is considered high over all river crossings and that the significance of these crossings is considered moderate (rating of 3) with the exception of the two major bridges, Msikaba and Mtentu where the significance is considered high due to the huge scale and height of the bridge structures and the high scenic quality of the river valleys.

It is considered that the significance of the impact of all the toll plazas during the day is low as these structures do not dominate the local setting. The Isipingo and Park Rynie Plazas are already in urban settings which are visibly compatible with the structures. It is the night scene (See Figure 7) that raises the significance of the impact considerably.

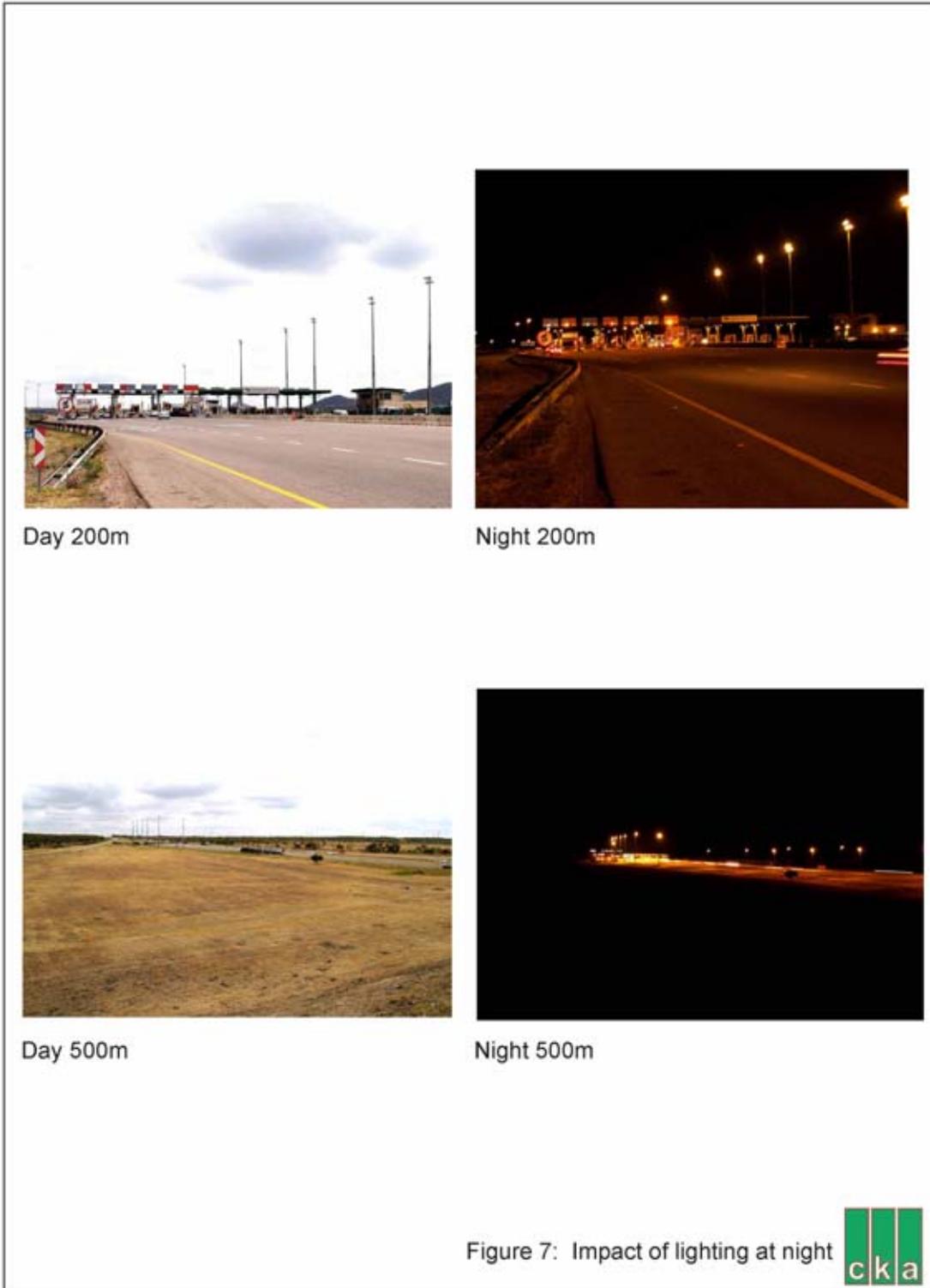


Figure 7: Impact of lighting at night

However, the light intrusion impact at night by most of the plazas is considered low to moderate as an unlit night scene is not considered a priority with the exception of the Mthentu Plaza (See Figure 6c) where the light spillage extends to the Mkambati Nature Reserve where the potential night scene tourism requirements would require an unlit environment as far as possible. The significance of the impact of the Mthentu Plaza is considered moderate to high.

4.2.4 *Genius Loci*

The spirit, or sense, of place is that quality imparted by the aspects of scale, colour, texture, landform, enclosure, and in particular, the land use. According to K. Lynch (1992) "it is the extent to which a person can recognise or recall a place as being distinct from other places as having a vivid, or unique, or at least a particular, character of its own."

The quality of *Genius Loci* is a function of attributes such as the scenic beauty or uniqueness and distinctive character of the built and cultural landscape.

The sense of place for the SANRAL Preferred Route is fairly constant from the Mzamba River to the outskirts of Lusikisiki. The route consists of rural open spaces that are dotted with scattered settlements mixed with cattle grazing and subsistence farming. The tranquil sense of punctuated by steeply sided river valleys that are generally wooded and dramatic. Due to the relatively flat topography these valleys are not always obvious until one reaches the valley edge. The sense of place in the vicinity of Lusikisiki and the pass down to Port St. Johns is markedly different to the previous section. It departs from the mental picture of the flat, rolling and open landscape with scattered homesteads to a more wooded mountainous area not specific to the image of the Transkei.

The most scenic / picturesque areas are the valley gorges and the area in the vicinity of the Mateku Waterfall (Photos 14, 15 & 16) and the waterfalls (Photo 29) near the Mnyameni River crossing. The valley bottoms are for the most part enclosed and the sense of place is well contained.

The area to the east of the Mateku Waterfalls imparts a rural wilderness sense of place with dramatic views from the top of the escarpment edge looking to the east and north-east. The section of the Mnyameni River that contains the waterfalls is spectacular and dramatic with steep sided cliffs. This area is, however, limited to a narrow strip outside which the sense of place reverts to the typical rural scene.

Implications for the Project

It is considered that for the most part the route alignments and the project components should not have significant impact on the sense of place. The exceptions to this statement are:

- The position of the SANRAL Preferred Route (Photo 16) where it passes to the east of the Mateku Waterfall will have a high significant impact of the wilderness ambience experienced from the edge of the escarpment (Photo 14). The reverse is true, however, when the area is viewed westwards from the road towards the escarpment and waterfall. The scenic views will enhance the travellers' experience.
- The bridges over the Mtentu (Photo 31) and Msikaba Rivers (Photo 30) will have a high significant impact on the surrounding environment due to the very dominant superstructure and height of the bridges with the bridge over the Mtentu River being more than a kilometre long.
- The Mtentu Mainline Toll Plaza could potentially have a significant visual impact on the Mkambati Nature Reserve, specifically at night when the lights of the toll plaza will be visible in what is currently an unlit environment. This impact will, over time, be diluted by the future electrification of the surrounding settlements which will negatively intrude in the nature reserve.

4.2.5 Visual Quality and Character

The visual quality is the visual significance given to a landscape determined by cultural values and the landscape's intrinsic physical properties (Smardon, *et al*, 1986). While many factors contribute to a landscape's visual quality, they can ultimately be grouped under three headings: vividness, intactness and unity.

The visual quality can be categorised under relative headings such as high, medium and low visual quality for the study area (Figure 8). High refers to those areas that have a high aesthetic appeal such as river valleys, the waterfall areas and the coastal zones. The medium areas are those that are relatively sparsely populated on the flatter open areas but which have been visually modified by minor infrastructure such as dirt roads and settlements. The low visual quality areas are those that are relatively highly populated and which have been heavily impacted on by overgrazing.

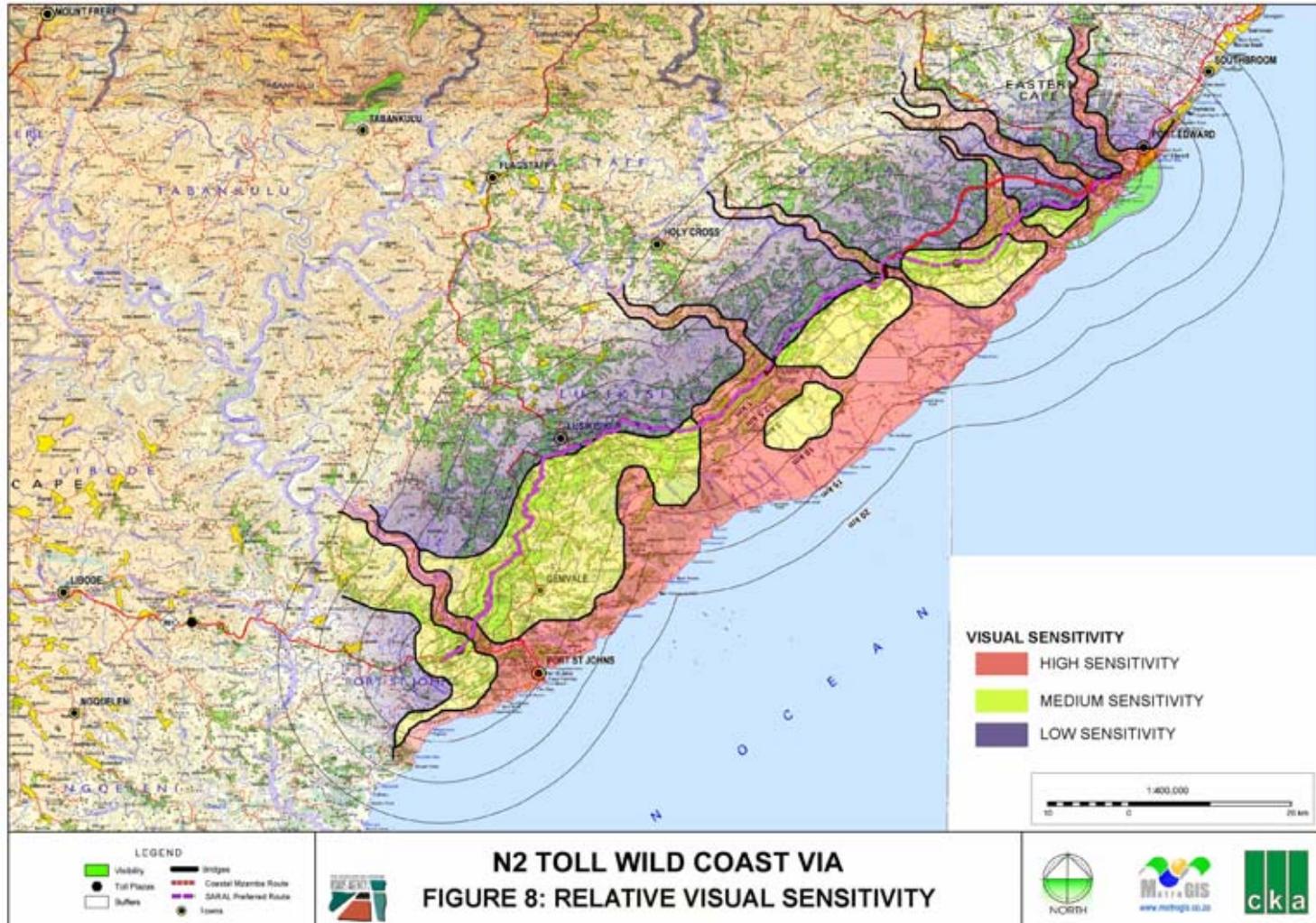


Figure 8: Relative Visual Sensitivity

Implications for the Project

Due to the relatively low scenic quality of much of the study the significance of the impact through the low visually sensitive areas is regarded as low. The significance of the impact of the project on the visually high sensitive areas is regarded as high. It will be necessary to implement mitigation measures to attempt to reduce the impacts. Minimal disturbance by construction through the valleys must be ensured and that rehabilitation should occur as soon as is possible. An area of major concern is the impact of the road on the Mateka River area and waterfall (Photos 14 & 15). The first prize would be to adjust further east beyond the ridgeline and if this is not possible, then the cut and fill slopes need to be shaped to blend in with the landscape and be vegetated as soon as possible. A second area of concern is the potential night light affect on the Mkambati Nature Reserve (Photos 36 & 37). Mitigation measures will be required to re-direct the light direction downwards and limit the light spillage.

4.2.6 Land Use

The major land use outside the urban areas around Lusikisiki is rural agriculture in the form of subsistence farming and cattle ranching.

Implications for the Project

It is not expected that there will be any impact on the land use for the area as none of them rely on the visual and aesthetic environment as a basis for the business activity. However, it must be kept in mind that should the road be built, the new access to the area could promote tourism in the area that would focus on the high scenic areas. It is therefore important that the visual impact on the high scenic areas be protected as far as possible from visual degradation which could reduce the tourism potential of the area.

4.2.7 The Scale of the Landscape

The vertical scale of the study area is relatively ill-defined due to the lack of dominant rising landforms. The horizontal scale is defined by the long open vistas through the open and rolling landscape. The section from Lusikisiki to Port St. Johns is more vertical with defined tall hills.

Implications for the Project

The scale of the landscape allows a partial absorption of the project components into the visual image of the landscape due to the rolling hills of the area. The landscape around Lusikisiki extending to Port St. Johns allows for a higher visual absorption.

5. IDENTIFICATION OF RISK SOURCES

Various risk sources for the visual impact have been identified for the construction and operation phases and can be classified as both negative and positive. The following general risks are associated with the visual intrusion in the landscape.

5.1 Risk Sources

5.1.1 Construction Phase

It is anticipated that the major risk source during construction would be:

Negative Risk Sources

- Excessive cleaning and stripping of topsoil for site offices, construction camps, servitudes and temporary access roads;
- The relatively random and disorganised lay down of building materials, vehicles and offices;
- Cut and fill slopes of access roads become highly visible if not re-vegetated and shaped to blend in with the existing topography;
- The extent and intensity of the security and construction lighting at night;
- Dust from construction activities;
- Open and un-rehabilitated landscape scarring;
- Uncontrolled exploitation of borrow pits and quarries without compliance to environmental controls related to aesthetic rehabilitation;
- Location and layout of construction workers camp if located in proximity of works area; and
- High seed bank of alien species in the topsoil can lead to the uncontrolled spread of exotic invader plant species along the edge of the road. This could create a vegetated strip that is visually contrary to the surrounding landscape.

Positive Risk Sources

- Image of construction activity could lead to a perceived view of progress and benefit to the community.

5.1.2 Operational Phase

It is anticipated that the major risk source during operation would be:

Negative Risk Sources

- Night lighting of toll plazas could create a beacon in an unlit rural setting;
- Night lighting at toll plazas could lead to attracting an informal truck shop;
- Areas and /or specific sites of high aesthetic value may be disfigured by the introduction of a highway within the viewshed resulting in a permanent change to the existing visual quality of visually sensitive areas;
- Constant disruption of rural night ambience by vehicle lights;
- The compromising of views from or the alteration of the ambience of natural areas or game farms;
- Site engineering, such as cuts and fills, could remain aesthetically incompatible with the surrounding landscape. Edges may not blend in with the landscape or cut slopes may be too steep to be adequately re-vegetated;
- Need to keep road reserves clear of vegetation will result in visual scarring;
- New access roads leave permanent visual scarring;
- The degradation of areas of particular visual character, such as ridges, valleys and drainage ways if the project components are placed too close by.

Positive Risk Sources

- New routes could present and promote existing high quality visual attributes of an area not normally exposed to the general public;
- The presentation of a very scenic landscape such as the Mateku Waterfall area or the huge and impressive bridge structures such as the Mtheku and Msikaba Bridges to the road users. This scenic experience has previously been limited to persons who specifically have travelled the area;
- The development could be the visual affirmation of progress and prosperity for the region. Localised visual perceptions of the economically depressed communities of the population have not been tested as these may be influenced rather by the economic and job opportunities that could exist rather than the direct visual perception of the project.

6. THE VISUAL ASSESSMENT

6.1 The Visual Analysis

This section describes the aspects which have been considered in order to determine the intensity of the visual impact on the area. The criteria includes the area from which the project can be seen (the viewshed), the viewing distance, the capacity of the landscape to

visually absorb structures and forms placed upon it (the visual absorption capacity), and the appearance of the project from important or critical viewpoints.

A broad scan was undertaken to obtain a quick impression of the visual quality and sensitivity of the entire study area (Figure 8).

6.1.1 The Viewshed

The viewshed is a topographically defined area which includes all possible observation sites from which the project will be visible. The boundary of the viewshed, which connects high points in the landscape, is the boundary of possible visual impact (Alonso, et al, 1986). Local variations in topography and man-made structures would cause local obstruction of views. The viewshed, based on the GIS assessment and fieldwork, extends for the main part varies from 1 km to greater than 20 km in several areas (Figures 4-6).

6.1.2 The Viewing Distance

The visual impact of an object in the landscape diminishes at an exponential rate as the distance between the observer and the object increases (Hull and Bishop, 1988).

Thus, the visual impact at 1000 metres would be approximately a quarter of the impact as viewed from 500 metres. Consequently, at 2000 metres, it would be one sixteenth of the impact at 500 metres. The view of the project components would appear so small from a distance of 5000 metres or more that the visual impact at this distance is insignificant. On the other hand the visual impact of the project components from a distance of 500 metres or less would be at its maximum (Figure 9.).

6.1.3 Critical Views

Views identified as being critical have been discussed under Section 4.2.3. These have been overlaid on the viewshed to determine the extent of these within the viewing zones radiating out from the project components.

Critical views are generally the scattered settlements from the Mtamvuna River to the Mtentu River, the deeply incised river valleys, the Mkambati Nature Reserve, the scenic area in the vicinity of the Mateku Waterfall and Msikaba River Gorge, the urban areas and settlements of the areas of Lusikisiki and Dumasi to Port St. Johns.