LANDSCAPE AND VISUAL AMENITY ASSESSMENT

BRAAMHOEK PUMP STORAGE SCHEME SITE & ACCESS ROADS

November 2005

For
ESKOM GENERATION

By

AFRICON ENVIRONMENT & SUSTAINABILITY CONSULTING

A Landscape and Visual Amenity Impact Assessment of the Potential Impact of Site and Access Roads for the Proposed Braamhoek Pumped Storage Scheme, Drakensberg, South Africa

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NOVEMBER 2005

Compiled for:

Eskom Generation

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EXECUTIVE SUMMARY

In assessing the potential impact of the access road alternatives on the receiving environment (landscape impacts, and visual amenity impacts) it must be noted that the impact of the 'proposed' activity already largely exists, except for singular elements where Greenfield sites will be traversed. In all instances there are typical examples of what the potential impact will ultimately visually look like.

Similarly the magnitude and significance of the proposed activity will also influence the ability of the landscape to absorb the visual and landscape impact of the proposed access roads. The proposed roads however will not significantly exceed the width of the current roads, keeping the scale of the activity within current experiential values and expectations. The proposed surface material for the roads will also influence the visibility and landscape quality of the receiving environment.

The length of the impact being a long linear activity could influence the visual and landscape quality. However based upon observations of the status quo and the scale of the project the impact will remain insignificant. Alignment changes which require extensive cut and fill exercises will increase landscape scaring and substantially increase the visibility of the project. It is suggested that near natural grade alignments be used as far as possible without compromising user safety, and ecological health.

The current roads within the receiving environment (topography, vegetation and land use) have an insignificant visual and landscape impact. The roads are relatively 'low key' and assist in opening the region to visitor experience. It is imperative that the status quo is retained with respect to visual and landscape quality. Due to the rolling topography throughout the project extent the roads are leading in nature, providing the element of surprise from viewer vistas. This planning effect must be retained throughout the project planning and design so as not to create monotonous straight lengths of road, with no experiential quality, which similarly does not acknowledge the natural topography.

With respect to landscape and visual impacts the potential impacts can be distinguished between two significant scenarios:

1. Alignment Alternatives on existing roads and similar rolling topography

The majority of the roads above and below the escarpment, including the Greenfield sites (excluding the Braamhoek pass down the escarpment) fall within this category. The existing and potential (greenfields) visual and landscape impacts will be insignificant, providing the visual and landscape mitigation measures are applied in the respective project lifecycle stages.

2. Alignment Alternatives down the escarpment

The proposed alignment down the escarpment , Braamhoek pass will have a substantial negative visual as well as landscape impact. This alternative will require extensive cut and fill exercises causing significant landscape scaring.

Recommendation

The least landscape and visually obtrusive alternatives are supported. The landscape and visual quality differences between the De Beers Pass, De Beers Skeurklip, and Kiesbeen alternatives are negligible.

The Braamhoek Pass alternative is not supported.

ABBREVIATIONS

EIA	Environmental Impact Assessment
GLVIA	Guidelines for Landscape and Visual Impact Assessment
L&VIA	Landscape and Visual Impact Assessment
PSS	Pumped Storage Scheme
ROD	Record of Decision
SEA	Strategic Environmental Assessment

1. INTRODUCTION

The following approach to Landscape and Visual Assessment is based upon the approach of The Landscape Institute and the Institute of Environmental Management and Assessment, UK, Guidelines for Landscape and Visual Impact Assessment (GLVIA).

The concept of visual intrusion or impact relates to peoples perception of the quality of the environment which they are experiencing.

Landscape and visual impact assessment is an evolving practice that continues developing to take account of new issues and assessment techniques. These include, amongst others, the continued importance of landscape character assessment and the greater emphasis on process and public participation, the development of systems for assessing environmental and 'quality of life' capital, and the increased use of EIA.

When considering landscape we consider the entire external environment, which entails the consideration of the relationships within the built environment, the nature and patterns of buildings, open spaces and trees, which compose our landscape heritage. Landscape is both important in the urban as well as rural context due to the following factors:

- Landscape is an important component of the natural resource base;
- it contains archaeological and historical evidence;
- it is the media for the existence of fauna and flora;
- and more subjectively it encapsulates character through the sensual, cultural and spiritual perception of society, illustrated through 'quality of life' and 'sense of place';
- and a media for recreation.

Landscape is often wrongly perceived as only the visual perception of a combination of landform, vegetation cover and the built environment. Landscape also embodies the history, land use and culture subjected on it by the hand of man. Similarly landscape is also perceived by seasonal change and the continual dynamic of man and natural processes.

2. LANDSCAPE AND VISUAL ASSESSMENT AS PART OF THE EIA PROCESS

Landscape and visual impact assessment are as essential component of the EIA process as the 'traditional' specialist studies. It has to be stressed that landscape and visual assessments are different to most specialist studies required for in the EIA process as it is **not** possible to quantify all aspects. The assessment of potential impacts on a landscape resource and on visual quality is a lot more complex, due to the fact that it is determined through a combination of quantitative and qualitative assessments and evaluations.

Landscape impact assessments include a combination of objective and subjective judgements. It is imperative that a clear distinction is made between subjective opinion (for instance the assessment of landscape value) and quantifiable impacts (such as determining the magnitude of change).

In the EIA process it is necessary to make broad assessment of the potential of significant impacts at the screening and scoping stages, based upon the nature, size, location of the proposed activity, and the scale of its likely environmental effects. For this initial stage it can be assumed that formally designated landscapes (such as protected areas, scenic landscapes etc) are deemed to be most sensitive to change than many other areas. Similarly, certain development and activity types are considered more likely to give rise to significant impacts, such as particular processes or operations (mining dumps and slimes dams), or particularly large in nature (physical extent or continuous nature of the activity such as power lines and highway systems). Within the EIA process the specific impacts of development activities on landscape considers each situation likely to impact on the landscape elements, characteristics and character is assessed and its significance evaluated on the basis of the nature and magnitude of impact and the sensitivity (including value or importance) of those elements, characteristics and character.

3. STAGES IN THE PROJECT LIFE CYCLE

The various phases of a development activity are characterised by different physical elements and activities. The duration of the potential impact is also important, as a lesser effect may be less tolerable if it continues for a significant period of time. Typical impacts and influences on landscape and visual quality during the various phases of a project lifecycle include the following:

Construction Phase

- Site and access roads,
- Cut and fill areas, including borrow and disposal areas,
- Material stockpiles,
- Staging areas,
- Construction camps, equipment and plant,
- Engineering support infrastructure,
- Parking, on-site accommodation and working areas,
- Temporary screening measures,
- Protection measures,
- Lighting,

Operational Phase

- Access,
- Infrastructure,
- Building and structures,
- Delivery, maintenance,
- Outdoor activities,
- Materials storage,
- Utilities,
- Lighting of roads and buildings,
- Car parks,
- Vehicle lights and movements,
- Landform, structure planting, and hard landscape features,
- Entrances, signs and boundary treatments,
- Areas of possible future extension.

Decommissioning and Rehabilitation Phase

- Access,
- After-use potential,
- Residual buildings and structures,
- Disposal of waste and rubble,
- Rehabilitation activities, including movement of material and construction plant.

4. ASSESSMENT APPROACH TO LANDSCAPE AND VISUAL EFFECTS

Although landscape and visual impact assessments are separate processes and approaches, they are inextricably linked. The assessment of landscape, its analysis and the assessment of landscape effects contribute to the baseline for visual impact assessment. The assessment of the potential impact on the landscape is carried out as an effect on an environmental resource, i.e. the landscape. Visual effects are assessed as one of the interrelated effects on population. These effects are derived from changes experienced in the physical landscape, which give rise to a change in the character and the experiential quality of the landscape, which in turn influences the perceived value.

Visual effects relate to the changes that arise in the composition of available views as a result of changes to the landscape, considering people's responses to these changes, and the overall effect to the visual quality.

The method of assessment and application is herewith discussed separately for both landscape and visual amenity evaluation.

5. LANDSCAPE ASSESSMENT

5.1 Aspects and Principles of Landscape Assessment

When considering the assessment of landscape the following principles and landscape elements provide the framework and platform for the baseline evaluations.

5.1.1 Elements

Individual components and elements which compose the landscape; such as hills, undulating terrain, valleys, forest, thicket, savannah woodlands, trees, plains, rivers and streams, wetlands, the build environment and infrastructure elements. These elements are quantifiable and can be described,

5.1.2 Characteristics

These are element or combinations of elements (as described above) which make a particular contribution to the character of an area, including experiential quality such as tranquillity and wilderness (more subjective in appreciation).

5.1.3 Character

Character is the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and how that is perceived by people. Character reflects the combinations of geology, landform, soils, vegetation, land use and human settlement. Character is also defined by the specific 'Sense of Place' of different places in the landscape. Character is further indicated by the process of characterisation, which classifies, maps and describes areas of similar character.

Landscape character assessments are conducted on national, regional and local level. However project based landscape assessments as part of the EIA process require detailed localised studies to be undertaken.

5.1.4 Visual Absorption Capacity (VAC)

A landscapes ability to accommodate and absorb change depends greatly on the type and extent of the proposed activity or change. This is proportionate to the sensitivity of the landscape, which is determined by the degree to which the landscape can accommodate change without adverse effects on its character. The visibility of a development is determined by the extent of existing or new landforms, existing and /or

new planting, as well as other factors which will influence the extent of its effect on the perceived character and visual quality of the surrounding landscape.

Landscapes differ in their inherent capacity to accommodate various forms of development. Sensitivity will vary according to the existing landscape, nature of proposed development, and the type of change being considered. Visual Absorption Capacity and Sensitivity do not form part of the baseline evaluation, but are considered during the assessment of ***effects***. Similarly a distinction must be made regarding the landscapes ability to accommodate change as opposed to the ***importance*** or ***value*** of a landscape.

5.1.5 Landscape Values, Scale and Magnitude

- **Patterns and Scale**: land form, land cover, land use and built development (these define the general character of the landscape and lead to the definition of character areas).

- **Special Values and Interests:** areas designated as conservation areas, protected areas and landscapes, and areas of architectural importance. Cultural and historical interest landscapes.

- **Professional valuations:** professional evaluations and studies on the specific landscape or visual resource if applicable.

- **Local values:** past and present perceptions regarding the resource by authorities, local residents and society.

5.1.4 Landscape Receptors

Figure 1 : Examples of typical landscape receptors

Landscape Aspect	Landscape Receptor
Landscape Elements & Features	• Trees, woodland, pastures, grasslands,

	savanna • Landform and topographical features e.g. open hill tops, coastlines, valleys, open green spaces • River corridors, streams, dams, rivers, wetlands • Built environment e.g. walls, paved squares, bridges, buildings etc
Landscape characteristics (tangible and intangible)	• Characteristic patterns and combinations of landscape features including landform, land cover and cultural elements which contribute to landscape character. • Scenic quality • Sense of place • Tranquillity or wilderness quality
Landscape Character	The distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and how this is perceived by people. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement. It creates the particular sense of place of different areas of the landscape.

5.2 The Landscape Assessment Methodology

5.2.1 Baseline Assessments

The intention of the baseline landscape assessments is to identify landscape elements, and characteristics that are valued and the society by whom they are valued.

- Review of the existing landscape and visual resource

The initial step in any landscape or visual impact assessment is to review the existing landscape and visual resource – baseline landscape and visual condition. This forms the basis from which the occurrence, estimation of magnitude and significance of the landscape and visual effects of the development may be identified and assessed.

Record and analyse the existing landscape features, characteristics, the way the landscape is experienced and the value or importance of the landscape and visual resources in the vicinity of the proposed development. This requires the following analysis:

Research/survey: both desk and field studies to assemble basic information.

Classification: Categorising the landscape into units or groups of distinct and recognisable type and character.

Analysis: Detailed analysis of the parts of the landscape and visual resource to gain an understanding of composition and experiential quality. Assess the importance of the various aspects of the landscape and visual resource.

- Landscape Baseline Analysis

Assimilation of information from baseline assessments (desk and field survey). Baseline section covers the existing elements, features, characteristics, character, quality and extent of the landscape. Distinction is made between:

  - Description and assessment of the individual elements, features, and characteristics of a landscape and their value or importance; and
  - Analysis of the way in which these components interact to create the character of the landscape.

- Landscape Character and Characterisation

The basis for understanding the landscape and the departure point for baseline surveys is the landscape character assessment and particular landscape characterisation. This baseline report provides a concise description of the existing character of the site and its

surrounding landscape, including the physical and human influences that have helped to shape the landscape and any current trends for change. This will include a classification of the landscape into distinct character areas or types, which share common features and characteristics.

- Landscape Character changes have a direct and immediate effect upon people's surroundings. It is necessary to identify the landscape components valued by the community or society, and assess why and how they are valued. Landscapes are inherently dynamic in nature, and changes induced by development may not necessarily be significant.

- Landscape Condition

This refers to the state of an individual area of landscape and is described as factually as possible. Areas deemed as poor condition however can still be highly locally valued, such as scarce land within city limits, or sites of industrial archaeological value. The assessment sets out what weight has been attached to the condition of the landscape and may also consider the scope for the development to contribute to the restoration or enhancement of the landscape.

- Landscape Value

Landscape value can be determined based upon the particular characteristics that contribute to a specific 'sense of place' or influence the way in which a landscape is appreciated or experienced, also considering special interest landscapes such as historical landscape (battlefields etc), cultural landscapes, or areas of scenic and wilderness interest. Landscape value may also describe the condition of the landscape elements and features, and the way that they contribute either positively or negatively (an industrial landscape may have a negative perception within the greater society). Landscape may also have value for the specific function that they perform, irrespective of the character of the landscape (such as agricultural, mining and industrial landscapes). Urban fringe landscapes may be of poor condition with no special interest, but may be highly valued locally as an accessible resource to society, similarly representing a scarce landscape in a localised area. A judgement needs to be made on the value or importance to society of the affected landscape. This will be based on and

take into account views of interested and affected parties, regarding what is important in a landscape and reasons therefore. The following is required during a value assessment:

- Establish the level of importance of the affected landscape and whether this is at local, regional or national level;
- Assess any losses in landscape features, characteristics, or functions to be assessed in relation to the importance or value attached to them;
- Enable the effects on other, less tangible, perceptual landscape characteristics to be assessed such as scenic quality, tranquillity or wilderness;
- Identify features that would be enhanced;
- Identify mitigation proposals, by avoidance or relocation, by offsetting negative effects through compensatory measures.

Landscape value assessment aims to reflect the value of the landscape at a specific scale. The assessment distinguishes between importance at different scales, some features are locally abundant but may be nationally scarce, or nationally abundant but locally scarce

- Sensitivity Receptors

Sensitivity receptors are landscape or visual resource elements / features or assemblages of elements / features that will be directly or indirectly influenced by the proposed activity. Receptors include features in the physical landscape that may be directly affected such as topographic, geological and drainage features, woodland, tree and grass cover, land use, etc. The importance and value of landscape receptors must also be determined.

5.2.2 Landscape Effects

The landscape impact assessment describes the likely nature and scale of changes to individual landscape elements and characteristics, and the effect on the landscape character, resulting from the proposed activity.

- Visual Absorption Capacity (VAC)

Determining the landscapes ability to accommodate and absorb change. This is dependent on the type and extent of the proposed activity or change. The visibility is determined by the extent of existing or new landforms, existing and /or new planting, as well as other factors which will influence the extent of its effect on the perceived character and visual quality of the surrounding landscape. Similarly a distinction must be made regarding the landscapes ability to accommodate change as opposed to the importance or value of a landscape. The VAC is determined by the qualitative assessment of the following:

  - Landscape and Topographical Features

    The topography of an area has a determined influence how and when you will experience a structure within the landscape. Landscape features such as ridgelines, peaks, spurs, outcrops, promontories, convex slopes and steep gradients are most visible and will tend to have a higher visual sensitivity; as opposed to valleys, concave slopes, and bottom lands which have a sheltering effect and are therefore less visually sensitive.

  - Land Cover

    Open areas such as grassland, ploughed fields and low fynbos vegetation are visually more exposed, and provide less visual absorption than thickets, forest and woodland.

  - Land Use

    Open playing fields, agricultural fields and low density residential areas are visually more exposed than land use practices such as industries, high-density residential areas, and commercial areas.

Each of the above is assessed in terms of low, medium or high. The VAC summary result is also evaluated in term of low, medium or high.

- Sensitivity

The sensitivity of the landscape as a resource will vary according to the existing landscape, nature of proposed development, and the type of change being considered. Sensitivity is not part of the baseline evaluation, but is considered during the assessment of effects. The degree to which an existing landscape can accommodate and absorb change from a development, without detrimental effects on it character is dependent on:

- Existing land use;
- The pattern and scale of the landscape;
- Visual enclosures / openness of views, and distribution of visual receptors;
- Scope for mitigation, being in character with the existing landscape;
- Value placed on the landscape.

The determination of the sensitivity of the landscape resource is based upon an evaluation of each key element or characteristic of the landscape likely to be affected. The evaluation will reflect such factors as its quality, value, contribution to landscape character, and the degree to which the particular element or characteristic can be replaced or substituted.

- Scale and magnitude of landscape effects

Based upon the scale or degree of change to the landscape resource, the nature of the effect and its duration, and if it is temporary of permanent. A distinction is made between the scale of the effect, the nature of the change and the duration, such as:

- Scale : large, medium, small;
- Nature : negative (adverse) or positive (beneficial);
- Duration : short, medium, long term / permanent or temporary.

5.2.3 Significance of Effects

The two principle criteria determining significance are the scale or magnitude of effect and the environmental sensitivity of the location or receptor. A higher level of significance is generally attached to large-scale effects and effects on sensitivity or high-value receptors; thus small effects on highly sensitive sites can be more important than large effects on less sensitive sites.

- Significance of landscape effects

The following principles concern the significance of landscape effects:

- The loss of mature or diverse landscapes, features, is likely to be more significant than the loss of new / homogenous elements.
- Effects on character areas, which are distinctive or representative, may be more important than the loss of areas in poor condition or degraded character which may present greater opportunities for enhancement.
- The loss of landscape elements, features or characteristics have greater weight if identified as having high value or importance.
- The sensitivity of the landscape is dependent on both the attributes of the receiving environment and the characteristics and effects of the proposed development and can only be established by carrying out the assessment. Landscapes with a high value and sensitivity to the type of change proposed are likely to be more seriously affected by development than those with a lower sensitivity.

6. VISUAL BASELINE ASSESSMENT

6.1 Visual Amenity Assessment Aspects and Principles

When assessing the visual amenity of an activity the visual assessment must include the visual envelope, the full extent of the area from which the activity will be visible.

The analysis of the visual baseline information identifies the extent and nature of the existing views of the site from the principle representative viewpoints, and the nature and characteristics of the visual amenity of the potentially sensitive visual receptors.

The potential extent to which the existing site is visible from surrounding areas can be presented on a plan using visibility mapping techniques such as zones of visual influence, visual envelopes or visual corridors. Elements such as landform, buildings or

vegetative elements that may interrupt, filter or influence views are indicated. Principle viewpoints are mapped and these views illustrated by photomontages.

6.1.1 Nature of the visual quality

The study area for the visual assessment must include the visual envelope, the full extent of the area from which the activity will be visible. The nature of the visual quality of the area along with the approximate **visibility** of the development, which is determined through topographic analysis from contour data, either manually or by computer;

6.1.2 Receptors of Visual Effects

Specific potential **receptors of visual effects**, including residents, visitors, travellers through the area and other groups of viewers;

Figure 2 : Typical visual receptors

Visual amenity of the affected population viewing the landscape	• Users of recreational landscapes / footpaths • Residents • Public sports grounds and amenity opens space users • Public road users • Workers • Views of and from valued landscapes

6.1.3 Zone of Visual Influence (ZVI)

Delineate the zone of visual influence; the sum of the categories mentioned above will determine the total experience of the structure in the landscape and receiving environment. The ZVI provides and indication of the area or community that will experience a visual influence from the structure

6.1.4 Principle View Points

Identify the principle view points. Prominent visual elements, which include hills and topographical features, heritage features, tall elevated buildings, and protected neighbourhoods.

6.1.5 Sensitive Visual Receptors

Highlight sensitive visual receptors. These receptors include heritage areas, wilderness areas, protected landscape and features, as well as protected architectural precincts.

6.2 The Visual Amenity Assessment Methodology

6.2.1 Baseline Assessments

The initial step in any landscape or visual impact assessment is to review the existing visual resource and visual condition. This forms the basis from which the occurrence, estimation of magnitude and significance of visual effects of the development may be identified and assessed.

- Identify Viewpoints

Looking outwards from the site the various viewpoints are identified, such as residential properties with windows with views of the activity. The actual **extent of visibility** is verified in the field due to the localised screening effects of buildings, walls, fences, trees, berms and embankments.

- Identify Representative Viewpoints

Principal **representative viewpoints** within the study area are identified during the site visit, these include public footpaths and visiting areas of open public access. Public and private view points are important.

- Identify Visual Receptors (Viewshed)

Visual receptors include the public or community at large, residents, visitors, and other groups of viewers as well as the visual amenity of people affected. The viewshed analyses the full extent of the zone of visual influence.

- Sensitivity Receptors

Sensitivity receptors are visual resource elements / features or assemblages of elements / features that will be directly or indirectly influenced by the proposed activity. Receptors include features in the physical landscape that may be directly affected such as topographic, geological and drainage features, woodland, tree and grass cover, land use, etc. The importance and value of visual receptors must also be determined, as per above.

6.2.2 Visual Effects

Assess the following:

- The changes in the character of the available views resulting from the activity;
- The changes in the visual amenity of the visual receptors.

- Identification of Effects

Systematic identification of potential sources of effects with respect to the potential visual receptors.

Simplified categories are used to describe and compare effects on views:

- The extent of the view that would be occupied by the activity (degree of visual intrusion) : full, partial, glimpse, etc;
- The proportion of the activity or particular feature that would be visible :full, most, small amount, none;
- The distance of the viewpoint from the activity and whether the viewpoint would focus on the development due to proximity or the development would form one element in a panoramic view;
- Whether the view is transient or one of a sequence of views, as from a moving vehicle or footpath.

- Sensitivity of visual receptors

Sensitivity of visual receptors and views will be dependent on:

- The location and context of the viewpoint;
- The expectations and occupation or activity of the receptor;
- The importance of the view.

The most sensitive receptors may include:

- Users of all outdoor recreational facilities including public rights of way, whose attention or interest may be focused on the landscape;
- Communities where the development results in changes in the landscape setting or valued views enjoyed by the community;
- Occupiers of residential properties with views affected by the activity.

Other receptors include:

- People engaged in outdoor sport or recreation;
- People travelling through or past the affected landscape;
- People at their place of employment.

- Scale of magnitude of visual effects

In the evaluation of the effects on views and the visual amenity of the identified receptors, the magnitude or scale of visual change is described by reference to:

- The scale of change in the view with respect to the loss or addition of features in the view and changes in its composition including the proportion of the view occupied by the proposed development;
- The degree of contrast or integration of any new features or changes in the landscape with the existing or remaining landscape elements and characteristics in terms of form, scale and mass, line, height, colour and texture;

- The duration and nature of the effect, whether temporary or permanent, intermittent or continuous;
- The angle of view in relation to the main activity of the receptor;
- The distance of the viewpoint from the proposed development;
- The extent of the area over which the changes would be visible.

6.2.3 Significance of Effects

The two principle criteria determining significance are the **scale** or **magnitude** of effect and the environmental sensitivity of the location or receptor. A higher level of significance is generally attached to large-scale effects and effects on sensitivity or high-value receptors; thus small effects on highly sensitive sites can be more important than large effects on less sensitive sites.

Significance of effects on visual amenity (quality)

The following principles are considered when assessing significance of visual effects:

- Large-scale changes which introduce new, discordant or intrusive elements into the view are more likely to be significant than small changes or changes involving features already present within the view.

- Changes in views from recognised and important viewpoints or amenity routes are likely to be more significant than changes affecting other less important paths and roads.

- Changes affecting large numbers of people are generally more significant than those affecting a relatively small group of users. In wilderness landscapes the sensitivity of the people who use these areas may be very high and this will be reflected in the significance of the change.

7. THRESHOLD CRITERIA

7.1 Landscape Impacts

7.1.1 Visual Absorption Capacity (VAC)

The VAC is determined by the qualitative assessment of the following landscape features:

VAC Summary	**Low**	**Medium**	**High**
Landscape Features	Low	Medium	High
Land Cover	Low	Medium	High
Land Use	Low	Medium	High

7.1.2 Magnitude

High	Total loss of or a major alteration to key elements / features / characteristics of the baseline
Medium	Partial loss of or alteration to one or more key elements / features / characteristics of the baseline
Low	Minor loss or alteration to one or more key elements / features / characteristics of the baseline
Negligible	Very minor loss or alteration to one or more key elements / features / characteristics of the baseline

7.1.3 Sensitivity

Sensitive viewpoint subject to great or moderate change	Significant impact
Change is moderate and view or feature is moderately sensitive	Moderate impact
Change is small, and VAC is good	Slight impact

7.1.4 Assessment of Effects

- Scale

Large, medium, small

- Nature

Negative or positive

- Duration

Short, medium, long term : permanent or temporary

7.1.5 Significance

Significant landscape susceptible to relatively small changes, eg. Residential properties and sensitive land uses	High
Landscape of moderately valued characteristics, reasonably tolerant of change eg. Sporting and recreational facilities	Medium
Relatively unimportant landscapes, potentially tolerant of substantial change eg. Industry and commercial centres	Low

7.2 Visual Amenity Impacts

7.2.1 Predicted Impact

Proposed scheme would result in effects that are a complete variance with the landform, scale, pattern of the landscape and would permanently degrade and destroy the integrity of valued characteristic features.	Adverse Impact
Proposed scheme would complement the scale, landform and pattern of the landscape, maintaining existing landscape	Neutral Impact

quality	
The proposed scheme would have the potential to fit in very well with the landscape character, improving the quality of the landscape through the removal of damage caused by existing land uses.	Beneficial Impact

7.2.2 Visual Effects

- Magnitude

Total loss or major alteration to key elements / features / characteristics of the baseline	High
Partial loss or alteration to one or more key elements / features / characteristics of the baseline	Medium
Minor loss or alteration to one or more key elements / features / characteristics of the baseline	Low
Very minor loss or alteration to one or more key elements / features / characteristics of the baseline	Negligible

- Contrast

A significant degree of contrast or integration of activity in the landscape	Strong contrast
A moderate degree of contrast or integration of activity in the landscape	Moderate contrast
A negligible degree of contrast or integration of activity in the landscape	Negligible / Acceptable contrast

- Duration

The duration and nature of the effect, whether temporary or permanent, intermittent or continuous

- Nature

Short term, Long term : Reversible or Irreversible

- Distance

Physical distance of the proposed activity and impact from the visual receptor

- Extent

The extent of the area over which the changes would be visible

7.2.3 Receptor Sensitivity

HIGH Significant change in landscape character over a large area
Majority of viewers affected/major changes in views

MEDIUM Moderate changes in a localised area
Many viewers affected/moderate changes in views

LOW Insignificant change in any component
Few viewers affected/minor change in views

7.2.4 Significance

The project will cause a significant deterioration in the existing view	Substantial adverse impact
Scheme would cause a noticeable deterioration in the existing view	Moderate adverse impact
The scheme would cause a barely perceptible deterioration in the existing view	Slight adverse impact

The scheme would cause a barely perceptible improvement in the existing view	Slight beneficial impact
Scheme would cause a noticeable improvement in the existing view	Moderate beneficial impact
The scheme would cause a significant improvement in the existing view	Substantial beneficial impact
No discernable deterioration or improvement in the existing view	No change

8. LANDSCAPE ASSESSMENT

8.1 Activity / Project Description and Background

The site for the proposed Braamhoek Pumped Storage Scheme (PSS) is situated 23 km north-east of Van Reenen on the farms of Zaaifontein, Braamhoek and Bedford. The study area forms part of the uThukela Regional District and is situated on the boundary of KwaZulu Natal and the Free State Province. The area falls within the Drakensberg escarpment. The proposed Upper Reservoir is on the head water tributary of the Wilge River, which flows into the Vaal River system. The proposed Lower Reservoir is in the headwater of the Klip River, which in turn flows south-eastwards into the Tugela River. The scheme's two reservoirs will be interconnected by enclosed tunnel systems, with pump-turbine units with a potential generation capacity of approximately 1332 MW.

The upgrading of existing roads and the construction of new access roads will be required for the construction and operation of the Braamhoek PSS. Road upgrading and construction is planned to commence approximately a year before the construction of the pumped storage scheme.

The upgrading of roads and construction of new roads is a listed activity in terms of Section 22 of the ECA of 1989. An EIA is therefore required for the upgrade and construction of these access roads.

To construct and operate the Braamhoek PSS, three levels of roads will be required:

- Roads providing access to the scheme from existing regional roads i.e. "external" access roads;
- Roads linking the Upper and Lower Reservoir sites i.e. "internal" access roads; and
- Roads providing access within the Upper and Lower Reservoir sites, as well as within the proposed Construction Camp i.e. "internal site" roads.

These roads will be approximately 10 m wide, but will have a 30 m wide road reserve, and therefore a 30 m wide corridor of potential impacts on the environment. The upgrading of existing roads requires suitable road construction material, which will be

obtained from borrow pits. Trucks and other vehicles will use these roads during construction and operation of the scheme.

Gravel roads used by Eskom, during construction activities (e.g. at the Upper Reservoir site) prior to the upgrade and construction of the access roads, will be maintained by Eskom during the period of their use. Thereafter their maintenance will revert back to the relevant road authorities.

Site roads are required to link various components of the scheme for external access. To provide "external" access to the reservoir and other components of the scheme sites, existing roads can be utilised from the existing National Road 3 (N3) at Swinburne in the north and from Regional Road 103 (R103) via Besters in the south. This alternative would require a new, wider bridge over the Wilge River.

As existing roads will be utilised for external access, environmental impacts are expected to be minimal. The upgraded roads will be designed to mitigate environmental impacts.

Three alternatives for the internal access roads have been identified for consideration during the Scoping Phase, namely:

- Alternative 1 – Braamhoek Pass;
- Alternative 2 – De Beers Escarpment; and
- Alternative 3 – De Beers Skeurklip.

Alternative 1 - Braamhoek

This road alternative will result in a total distance between the Lower and the Upper Reservoir of 19 km. This alternative requires the construction of 24 km of new road. The route follows the Drakensberg Escarpment using the existing track, Braamhoek Pass. The new section of road will link in with the existing road network to the south of the

Lower Reservoir, where the District Road 48 (D48) and Provincial Road 275 (D275) will be upgraded to link to the R103 near Besters.

- This alternative is the most direct route between the Lower and the Upper Reservoirs (19 km);
- This alternative is the second most economical alternative in terms of construction costs;
- In places the route will follow the original ox-wagon route on the Braamhoek Pass;
- Due to the new alignment to accommodate the design speed, this route will require new road construction;
- Road construction could potentially have a negative impact on the fauna and flora and heritage resources;
- New road alignment could potentially have a negative visual/aesthetic impact;
- Road construction will involve the construction of sharp 'hairpin' bends;
- On top of the escarpment, a further 16 km of new road will be required;
- Requires large amounts of material for the 24 km of new road construction from borrow pits;
- More costly than Alternative 2 (De Beers Escarpment) due to construction of new roads;
- Positive socio-economic impact due to improved access; and
- No distinction can be made between the alternatives in terms of potential pollution from construction activities.

Alternative 2 – De Beers Escarpment

This road alternative will result in a total distance between the Lower and the Upper Reservoir of 32 km. This road alternative requires the construction of 23 km of new road. The existing road D48 will be upgraded and a new link road along the escarpment will provide a link to the Upper Reservoir site. The D48 and D275 will be upgraded to link to the R103 at Besters.

- Results in a travelling distance of 32 km between the Upper and Lower Reservoir sites – this is the second shortest route, distance wise;
- Less costly than all three other alternatives (1, 3, and 4) because it requires only 23 km of new road construction;
- Follows mostly existing road with 23 km of new road, therefore minimal disturbance of fauna and flora;
- Requires large amounts of material for the 23 km of new road construction from borrow pits;
- Positive socio-economic impact due to improved access; and
- No distinction can be made between the alternatives in terms of potential pollution from construction activities

Alternative 3 – De Beers Skeurklip

This road alternative will result in a total distance between the Lower and the Upper Reservoir of 58 km. This alternative utilises the full length of the S61 and D48, but requires that these roads be fully upgraded. The S922 provides the link to the Upper Reservoir site. The D48 and D275 will be upgraded to link to the R103 at Besters.

- This alternative is the third shortest route between Upper and Lower Reservoirs (58 km);
- The distance is almost double the distance of Alternative 2 (De Beers Escarpment), making travel time between the Upper and Lower Reservoir sites longer and thus this will have an detrimental effect on the scheme from an operational point of view;
- This alternative is also the most costly to construct;
- Uses existing roads almost entirely therefore this alternative will cause little disturbance to fauna and flora and heritage resources;
- Requires relatively little material from borrow pits;
- Positive socio-economic impact due to improved access; and
- No distinction can be made between the alternatives in terms of potential pollution from construction activities.

Alternative 4 – Kiesbeen

This road alternative will result in a total distance between the Lower and the Upper Reservoir of 114 km. This alternative uses the existing N3 through Van Reenen's Pass for access to the Drakensberg Escarpment. The S790 and S922 will provide a link from the N3 to the Upper Reservoir. D48 and D275 will provide the link from the N3 to the Lower Reservoir.

- This alternative is the longest route (114 km) – almost double Alternative 3 (De Beers Skeurklip) and almost four times the distance of Alternative 2 (De Beers Escarpment);
- This alternative is the second most costly to construct;
- From an operational point of view, this alternative is not viable as the distance and travel time is too great;
- Uses existing roads and therefore would cause little disturbance to fauna and flora and heritage resources;
- Requires relatively little material from borrow pits; and
- No distinction can be made between the alternatives in terms of potential pollution from construction activities.

The following surfaced internal roads will be required to provide access to the various components of the scheme in addition to the main access roads described above. These roads will also form part of the EIA process for site access roads:

- Approximately 18 km of road in the vicinity of the Lower Reservoir, comprising:

    1. An entrance road;
    2. Access to the Construction Camp;
    3. Access to the Lower Reservoir wall;
    4. Access to the outfall structure;
    5. Access to the main access tunnel entrance;
    6. Access to the surge chamber access tunnel entrance; and
    7. Access to the exploratory tunnel entrance.

- Approximately 7 km of road in the vicinity of the Upper Reservoir site, comprising:

    1. An entrance road;
    2. Access to the Upper Reservoir wall;
    3. Access to the intake structure;
    4. Access to the surge shaft; and
    5. Access to the site buildings.

These roads will need to be constructed and would be privately owned by Eskom.

8.2 Landscape Elements

- Geological Description

The study area is underlain by sedimentary rocks of the Karoo Supergroup, more specifically of the Ecca and Beaufort Groups, which have been intruded by dolerites of the Karoo Dolerite Suite. The sedimentary units are of Middle to Upper Permian age (260 - 250 million years), while the dolerites belong to the Lower Jurassic age (183 million years). The Ecca Group is represented at the base of the succession by the Volksrust Formation, which comprises a monotonous series of dark greyish-blue silty mudstones and claystones, which were deposited in a sheltered, nearshore, marine environment (Poltech, 1999). Although these rocks do not appear to have undergone deep weathering (3 – 5 m of pale yellowish or greyish clayey, residual soil was observed in a deep erosion donga in the foothill zone), they are typical of many Karoo mudrocks in experiencing rapid disintegration on the exposure of fresh surfaces to the air.

The Beaufort Group comprises the bulk of the geological column, with almost the entire face of the escarpment being cut in these rocks. The basal unit of the succession is the Frankfort Member, which is some 130 m thick, including some thin dolerite sills. Previously known as the Estcourt Formation, this unit consists of a succession of inter-bedded greyish white to greyish blue siltstone and sandstone layers, which often contain abundant mica along bedding planes. The sandstones are usually dirty when fine textured, classifying as greywackes, becoming cleaner as they coarsen upwards to become sublitharenites. Sandstones of the Beaufort Series, grey or blue when fresh,

weather rapidly to a soft and friable state in outcrop. They are more resistant than shales of the same series, and often crop out as ledges around the hills composed of this series. Through Estcourt and districts to the west these ledges show prominently wherever the road climbs from the flat-floored valleys over the many intervenining ridges.

Above the Frankfort Member is a series of strata dominated by dark greyish mudrocks. Some 280 m in thickness, this unit contains numerous two to five metre thick horizons of greyish white sandstone. In the upper part of the succession two thicker sandstone bands outcrop conspicuously in the escarpment face. The mudrocks of this unit are fairly typical of other Karoo mudrocks in their propensity to disintegrate in exposure to the air.

The upper edge of the escarpment is formed by a prominent sandstone known as the Rooinek Member. In reality, this unit consists of a series of sandstone bands, separated by thin mudstone horizons, but, as a whole, it forms a resistant stratum about 50 m in thickness, which also outcrops very widely in the plateau area behind the escarpment.

- Landscape and Topography

The topography of the proposed site is typical of the Drakensberg escarpment. The Upper Reservoir site (Bedford farm) is situated at an altitude of 1700 m and consists of rolling grassland, with incised drainage lines.

Figure 1 : Undulating hills of the upper reservoir landscape

The Lower Reservoir (Braamhoek farm) is situated in the foothills of the Drakensberg escarpment at an altitude of 1220 m, in typical grassland with rolling hills, small streams, erosion gullies and a few farm dams.

Figure 2 : Rolling hills and flatter plains of the lower reservoir landscape

The Upper and Lower Reservoir sites are separated by the Great Escarpment, which is a giant horseshoe-shaped feature peculiar to southern Africa, where it separates an elevated interior plateau from a coastal hinterland at lower altitude (Poltech, 1999). The Great Escarpment was initially located along the coastline at the time of the break-up of

the Gondwanaland super-continent between 160 and 120 million years ago. Erosion has driven it inland to its present position since that time. As it receded, vast erosion surfaces were formed simultaneously above and below the escarpment. Remnants of the oldest of these, the African surface, form the lower interfluves at elevations of around 1750 - 1800 m in the vicinity of the Upper Reservoir site. In this watershed area, African planation has been relatively recent. Despite this, substantial thick weathered and residual material has developed on dolerites and sandstones close to the edge of the escarpment.

Figure 3 : Escarpment edge

The access roads to the Lower Reservoir site lie within the upper part of the Ladysmith Basin, formed by ongoing erosion along headwater tributaries of the Tugela River. In this area all vestiges of the African surface have been removed by erosion, and the landscape is dissected and characterised by frequent dolerite koppies and relatively thin soil mantles, except in the high rainfall zone in proximity to the escarpment. The influence of active down-cutting within streams emerging from the base of the escarpment, such as the Braamhoekspruit, can be seen in over-steepening of parts of the scarp front, which has led to large slope failures in some areas, for example, to the east of the pumped storage scheme site (Poltech, 1999).

In the area of the access roads to the Upper Reservoir site, local relief is of the order of 100 m. Low, flat topped koppies and spurs characterise the landscape and have resulted from the strong structural influence of flat-lying strata of the Karoo Supergroup,

particularly the Rooinek Sandstone, which outcrops extensively in the area. Locally, streams have incised through the sandstone to depths of up to 50 m, forming small waterfalls and narrow valleys, one of which is a headwater of the Wilge River and contains the Upper Reservoir site.

Figure 4 : Head waters to the Wilge River

- Land Use

The regional land use is agricultural in nature. The local land use is all agricultural and rural livelihoods. Livestock and grazing are the primary economic categories, with extensive cattle husbandry, sheep and goat herds. Planted crops are limited in the upper reservoir region. There is a marked increase in planted crops in the lower reservoir region, especially the section directly below De Beers Pass due to the gradual topography which flattens out considerably from the escarpment.

Figure 5 : Cattle husbandry in the upper reservoir region

Figure 6 : Extensive Planted Crop in the lower reservoir region

- Vegetation

The following constitutes a summary of the vegetation specialist assessment for all the alternatives. Although vegetatively the areas are similar, species diversity as alluded to below differs for the various alternatives. It is not the purpose of the L&VIA to quantify the sensitivity of the vegetation from a biophysical perspective, but to quantify the ability of the vegetation to absorb any visual impact.

The area lies above and below the Drakensberg Escarpment. The area falls within Veld Type 57 North-eastern Sandy Highveld on top of the Drakensberg to a transition with 65,

Southern Tall Grassland (Acocks 1975) on the farm Braamhoek 1220, or according to Bredenkamp et al 1996 Veld Types 41, Wet Cold Highveld Grassland and 43 North-eastern Mountain Grassland of which the former appears to be the most applicable.

It seems that it is a general farming practice in the area to burn the veld at this time of the year, in order to provide palatable grazing for the livestock. At the time of the assessment most of the area had been burnt or was in the process of burning as veld fires were seen in the area on a daily basis. Most of the grassland was in various stages of recovery according to the length of time since the burn. Over most of the area the grasses had not recovered to flowering stage while forbs were also at varying levels of recovery. It may therefore seem that some areas exhibited a greater biodiversity than others along the route.

Swinburne to Kiesbeen (all alternatives)

The gravel road (S790) from Swinbourne to farm Kiesbeen 426 is a provincial road, poorly constructed, largely comprising cobble-like gravel. The road servitude is at least 20 m wide and like that of the previous road with which it links up has had a substantial impact on the former vegetation cover. Due to construction activities most of the vegetation along the route is comprised of the grass *Hyparrhenia hirta*. Like that of the proceeding sections, 'natural' grassland still occurs along the fence lines, where some biodiversity is found. Some trees, mostly Willows *Salix fragilis* grow along the larger tributaries of the Wilge River. Stream and wetland crossings have mostly been poorly constructed and maintained with the result that they exhibit various levels of disturbance.

De Beers Pass Road (all alternatives)

The provincial road (S61 and D48) from the farm Kiesbeen to Bester over De Beers Pass is similar in construction to that of the previous provincial road, with a similar width. It is initially quite rough becoming less stony. River and wetland crossings suffer the same fate as that along the other provincial roads and are to some extent degraded. The road reserve is dominated by Thatch grass *H. hirta* with stands of *H. tamba* along De Beers Pass.

Species richness along this road is similar to that described for the other provincial roads due to the extent of disturbance during road construction activities. Alien woody vegetation such as Willows *Salix fragilis* and Wattle *Acacia mearnsii* occur at some of the bridges and culverts. Plants recorded at and under the bridge across the Wilge River included *Senecio polyodon, Salis fragilis, Artemisia afra, Cyperus fastigiatus, Asparagus laricinus, A. cooperi, Oenothera rosea, Persicaria* sp. and *Rhus gerrardii*.

De Beers Pass road to farm Braamhoek (All alternatives)

This section of the proposed road originates at the De Beers Pass road and consists of a track on the farm Braamhoek 1220. This track runs north-easterly for approximately 2 km before angling more to the east. For the most part the existing track runs through disturbed grassland dominated by the grass *Hyparrhenia hirta* with few forbs evident. At this point the proposed road does not continue on the existing track but continues NNE in a shallow arc through *H. hirta* dominated grassland for approximately 2,5 km before linking up with an existing north-south track about 1 km south of the intersection. A portion of this has been burnt and many forbs especially *Hypoxis* spp. and the Eland Bean *Elephantorrhiza elephantina*, a suffrutex, were emerging and beginning to flower in the burnt area, as well as, but less apparent in the unburnt grassland. Several grasses and forbs were noted (Table 2-1). A seep and drainage line within the former burnt area may lie along the proposed route.

From the junction of this proposed section to K and on to N an existing track runs through a wetland for approximately 3 km. Part of this road has been raised as a result of the seasonal marshy conditions, several streams crossing the track. Much of this wetland has been modified by past farming practices and most of this south of the track will be flooded by the proposed Braamhoek dam.

Braamhoek Pass (Alternative 1)

An existing track branches off the track and extends northwards to a former farmhouse in northwestern Braamhoek, situated in a stand of Syringa *Melia azerdarach* and Wattle

Acacia spp. The proposed new road extends northeast, crossing extensive seasonal and permanent wetlands lying between the arms of streams originating from springs along and at the foot of the escarpment. A permanent spring at 28° 17' 15,3" S; 29° 33' 16,2" E is situated at the foot of a rocky ridge between the arms of two streams feeds the wetlands as well. After crossing this wetland the proposed road extends across a floristically rich grassland including scattered populations of *Hoffmannseggia sandersonii* and large numbers of *Watsonia* sp. cf *confusa / lepida* clumps, continuing upslope past the former farmhouse referred to above. It crosses a marshy stream to ascend a narrow spur in order to link up with a track extending downhill along the boundary between the farms Cotswold 10382 and Oulston 8510, at the top of the escarpment. Most of this area had been burnt prior to this assessment and many grasses were only sprouting and many could not be identified. Many forbs were also sprouting and the species richness along the wetland and intervening area was impressive.

The spur was relatively narrow with steep slopes and patches of scarp forest in the valleys on either side exhibiting abrupt margins as a result of the frequent grass fires. A few *Protea roupelliae* and clumps of coppicing *Protea* sp. cf *simplex* grew along the upper section of the spur.

Species richness and abundance was less along the spur but included several other species which in many instances did not occur lower down.

New Scarp road from De Beers Pass road (S61) over the farms Strathmorn, Blomhoek, Chatsworth, Oulston to Bedford (Alternative 2)

The proposed road follows an existing farm track along the edge of the escarpment starting from the De Beers Pass Road it extends NNE along the boundary between the farms Ward 1638 and Strathmorn 9878, swinging northeast along the boundaries between Cotswold and Blomhoek 227, Chatsworth 388 and Oulston, and Bedford 2 1845 and Braambosch 14497. The terrain is undulating grassland, with wetlands flowing north or south according to the watershed. Stands of wattle *Acacia* spp. and eucalypts *Eucalyptus* spp. occur on the farms Chatsworth and Blomhoek. Several clumps of a hairbell *Dierama* sp. cf *robustum* grew at the junction of the track with that of Alternative 1.

Most of the grassland on these farms had been burnt, some sections more recently than others. This resulted in a short but mixed grass sward, species being difficult to identify due to lack of flowering material. However *Rendlia altera* seemed to be one of the dominant species. Forbs were common on the farms Ward and Braambosch (Table 2-1). For the most part the proposed road followed existing tracks deviating only on the farm Oulston. Areas of exposed bedrock were present along the track on this farm, on Braambosch and on Bedford. Typical bedrock plants included *Crassula dependens* and *Psammotropha myriantha*.

Despite the farm management practices in the area the grass sward was still good. However extensive areas of erosion were seen along the track, most associated with wetlands along the escarpment margin.

Provincial road S922 from the Farm Kiesbeen to Bedford (Alternative 3)

The road from the farm Kiesbeen 426 to the farm Bedford follows an existing provincial road, which is relatively poorly maintained. The road servitude is approximately 20 m wide but due to road construction most of the route exhibits disturbed conditions, and a vegetation cover dominated by the grass *Hyparrhenia hirta*. Remnants of the former grassland including scattered clumps of *Watsonia* sp. cf *lepida*/ *confusa* still occur along the fence lines fringing the road reserve, and where construction activities have not extended as far as the fence on either side of the road. Several clumps and individuals of a hairbell *Dierama dracomontanum* grew within the road reserve on the farm Langspruit 448 at 28° 13' 58,8" S; 29° 24' 04,4" E. Some Ouhout *Leucosidea sericea* grew along the streams which the road crossed.

On the farms Maggie's Deel 1565 and Klein Drakensberg 256 the farm track fringes rocky outcrops and exposed bedrock with similar plant communities to that seen on Oulston and Bedford.

Three dominant vegetation structures were identified from the above and the field assessments, namely:

- Grassland (including grazing and pastures),
- Montaine / Escarpment forests,
- Wetlands and Riparian vegetation.

Grassland

The area is dominated by grassland, and a short forb and herbaceous layer. Much of the structure has been significantly altered by farming intervention in artificially manipulating the natural grassland through a burning regime to form pastures for grazing. The grassland is characteristic of a short grassland (height).

Figure 7 : Rolling short grassland

Montaine / Escarpment Forest

The only naturally occurring forests in the area occur along the protected buttresses of the escarpment. Sheltered and protected from cold and fire regimes in the deep valleys and ravines.

Figure 8 : Indigenous Forest along the Escarpment

Figure 9 : Indigenous forest dominated by Podocarpus sp.

Wetlands and Riparian Vegetation

There is a distinct difference in the structure of the wetland and riparian vegetation. In the study area the wetlands are characterised by extensive reed beds and sedges.

Figure 10 : Short wetland sedges and reed beds

The riparian vegetation structure is poorly defined, with the sporadic occurrence of tree and shrub structures along its course.

Figure 11 : Sporadic tree and shrub riparian vegetation

8.3 Characteristics

The study area and surrounding region is prominent in topographical identify – the Drankensberg. Against this dramatic backdrop is a region which displays a picturesque, tranquil, rural farming characteristic. The combination of dramatic and contrasting

topography, appealing monotone vegetation and farming / rural land use establishes a strongly defined 'sense of place' and characteristic.

8.4 Character

A rural farming character placed within a region with well defined 'sense of place' provides the region and study area with very high visual and landscape character. The seemingly unspoilt and remoteness of certain sections of the access roads further adds to the quality of the character of the area. The experiential quality of the distinct character is further enhanced by the occurrence of rare and endangered mega-species occurring in the area, such as Blue and Crowned Cranes. The region is similarly sparsely populated which also further emphasises the seemingly remoteness and isolation experienced.

8.5 Visual Absorption Capacity (VAC)

In considering VAC of the roads it must be understood that the activity already exists in most of the alternatives, with only minimal Greenfield sites proposed. The activity is generally well absorbed into the environment due to the small scale and 'low key' quality of the current status.

The landscape does not have the ability to absorb substantial impact types. The vegetation cover is very low, the topography although relatively scenic and diverse is predominantly rolling in nature. The land use is limited, restricted to natural and rural farming, with little to no clutter or diversity.

Similarly the very specific character of the receiving environment will not be able to support large scale development without compromising the landscape and visual quality, irrespective of the level of ecological quality.

8.6 Landscape Receptors

Landscape Aspect	Landscape Receptor
Landscape Elements & Features	• Natural low grasslands, pastures and fields • Extensive wetland systems and streams • Rolling, undulating hills and plains, resulting in more prominent view receptors to the site. • Dramatic escarpment landscape • Wilge River
Landscape characteristics (tangible and intangible)	• Picturesque, tranquil, rural farming characteristic • Dramatic and contrasting topography, appealing monotone vegetation and farming / rural land use establishes a strongly defined 'sense of place' and characteristic • Very high scenic quality • Strongly defined sense of place
Landscape Character	• Well established mature rural farming community, with dramatic natural escarpment and mountainous backdrop.

9. VISUAL BASELINE ASSESSMENT

The objective of the visual assessment can be considered two fold – the potential visual impact which the roads may have on the viewer experience of the landscape; and the impact of the visual experience from the respective road users. The two are not necessarily complimentary.

9.1 Viewpoints

- S790 / S922

The activity is existing. Many landscape view point occur along this alignment. These include the prominent Tandjiesberg and Nelson's kop which are the most significant topographical features. The S922 crosses the upper reach of the Wilge River in an idyllic seepage and wetland flood plain.

Figure 12 : Tandjiesberg

Figure 13 :Nelson's Kop and the Two Sisters

Figure 14 : Upper reaches of the Wilge River and associated flood plains

- S61 / D48

De Beers Pass

The activity is existing. This alignment traverses similar terrain as the previous. De Beers pass affords magnificent views across the escarpment as the alignment drops to the lower reservoir region.

Figure 15 : Views over the escarpment on De Beers Pass

Figure 16 :De Beers Pass

- Braamhoek Pass

Braamhoek Pass alternative is the most significant viewpoint with the alignment cutting into the steep drop from the top of the escarpment at the upper reservoir site to the bottom of the escarpment at the lower reservoir site.

Figure 17 : Views to the Escarpment from the lower reservoir site

1.0.□.□.□.□.□.□. ▪ □□ **Principle Representative Visual Receptors**

Visual amenity of the affected population	• Footpath users

viewing the landscape	• Current Residents of farms • Public road users • Workers • Potential visitors to the area

1.0.□.□.□.□.□.□.□ ▪ □ **Sensitive Visual Receptors**

- Escarpment viewshed
- Surrounding farming community

1. L&VIA SUMMARY

In assessing the potential impact of the access road alternatives on the receiving environment (landscape impacts, and visual amenity impacts) it must be noted that the impact of the 'proposed' activity already largely exists, except for singular elements where Greenfield sites will be traversed. In all instances there are typical examples of what the potential impact will ultimately visually look like.

Similarly the magnitude and significance of the proposed activity will also influence the ability of the landscape to absorb the visual and landscape impact of the proposed access roads. The proposed roads however will not significantly exceed the width of the current roads, keeping the scale of the activity within current experiential values and expectations. The proposed surface material for the roads will also influence the visibility and landscape quality of the receiving environment. Asphalt roads do however seem to protrude substantially more than gravel layer roads, which tend to blend in more with the environment, due to the use of local natural materials.

The length of the impact being a long linear activity could influence the visual and landscape quality. However based upon observations of the status quo and the scale of the project the impact will remain insignificant. Alignment changes which require extensive cut and fill exercises will increase landscape scaring and substantially

increase the visibility of the project. It is suggested that near natural grade alignments be used as far as possible without compromising user safety, and ecological health.

The current roads within the receiving environment (topography, vegetation and land use) have an insignificant visual and landscape impact. The roads are relatively 'low key' and assist in opening the region to visitor experience. It is imperative that the status quo is retained with respect to visual and landscape quality. Due to the rolling topography throughout the project extent the roads are leading in nature, providing the element of surprise from viewer vistas. This planning effect must be retained throughout the project planning and design so as not to create monotonous straight lengths of road, with no experiential quality, which similarly does not acknowledge the natural topography.

With respect to landscape and visual impacts the potential impacts can be distinguished between two significant scenarios:

1. Alignment Alternatives on existing roads and similar rolling topography

The majority of the roads above and below the escarpment, including the Greenfield sites (excluding the Braamhoek pass down the escarpment) fall within this category. The existing and potential (greenfields) visual and landscape impacts will be insignificant, providing the visual and landscape mitigation measures are applied in the respective project lifecycle stages.

2. Alignment Alternatives down the escarpment

The proposed alignment down the escarpment , Braamhoek pass will have a substantial negative visual as well as landscape impact. This alternative will require extensive cut and fill exercises causing significant landscape scaring.

11. RECOMMENDATION

The least landscape and visually obtrusive alternatives are supported. The landscape and visual quality differences between the De Beers Pass, De Beers Skeurklip, and Kiesbeen alternatives are negligible.

The Braamhoek Pass alternative is not supported.

Visual Mitigation Suggestions

- Placement and rehabilitation of borrow pit areas
- Minimise cut and fill areas
- Revegetate and rehabilitate all cut and fill areas
- Minimise the width of the roads as well as road reserves
- Use of only naturally occurring grass seed base and vegetation in any revegetation efforts
- Culverts and bridges crossing streams, wetlands and rivers should be of sensitive design, use of natural materials is encouraged
- Storm water management structures; use of natural materials are encouraged especially as stone pitching.

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