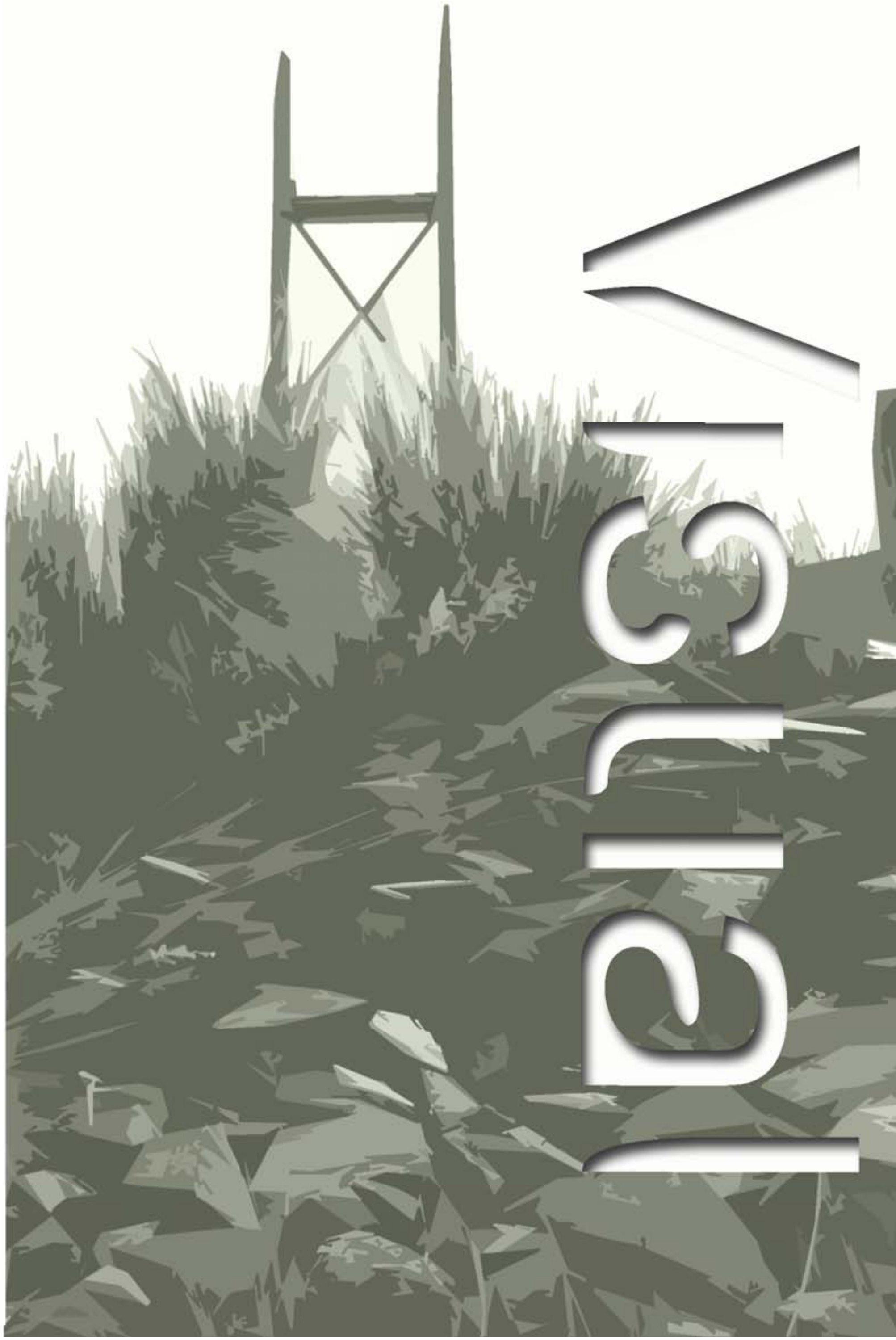
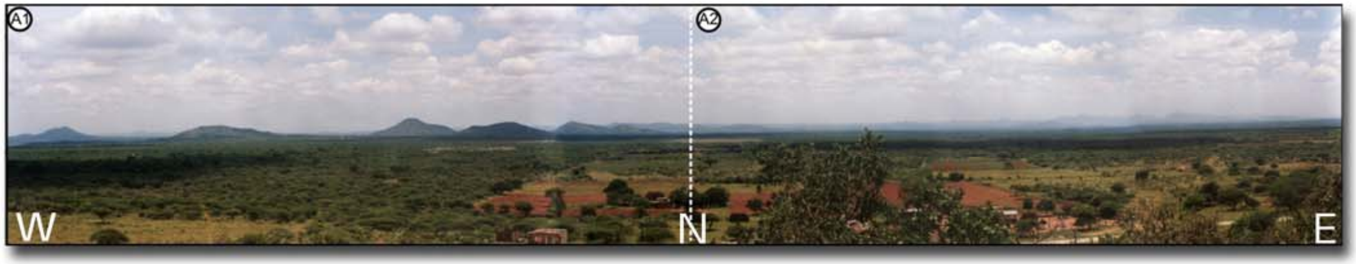

"We don't describe the future we see; we see the future we describe."
Thabo Mbeki (Bowes 2004:3)

E50

E Visual aspects





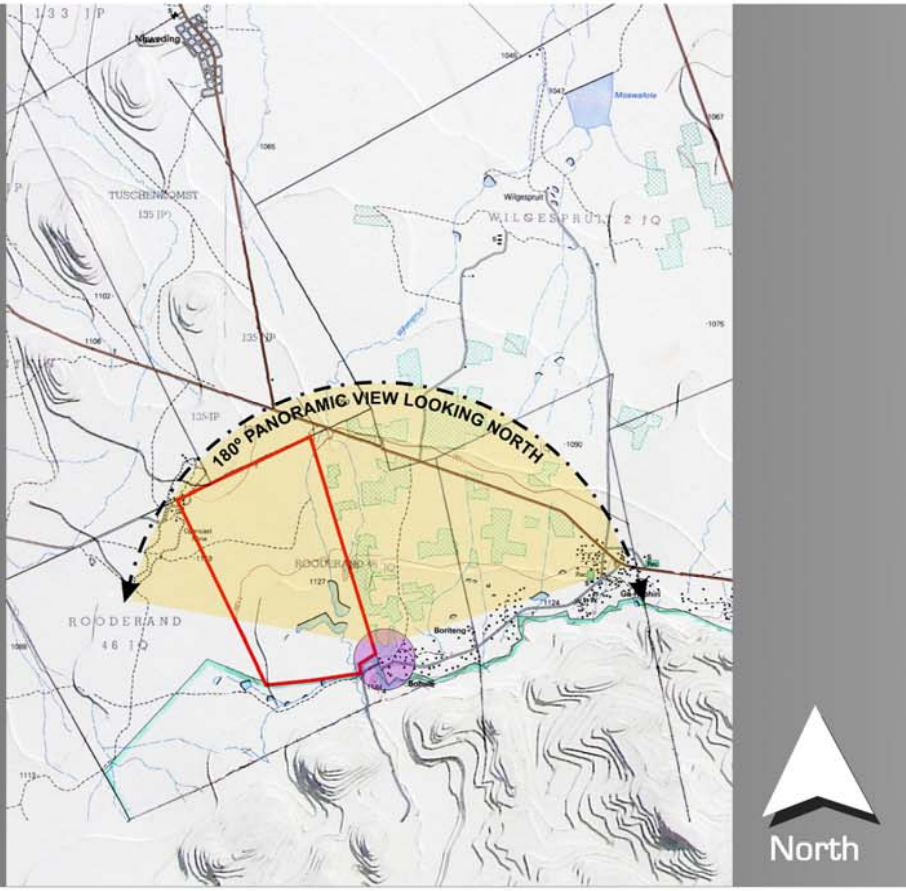


Figure E.1 Panoramic view looking north

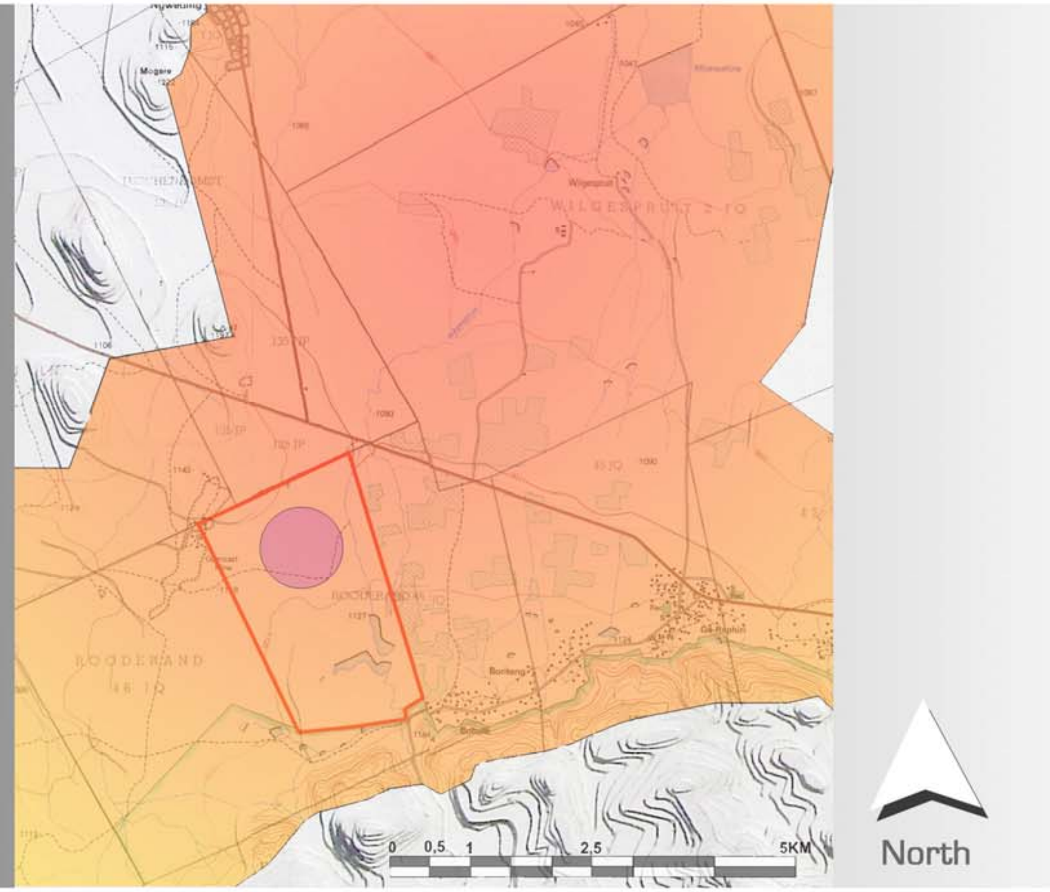


Figure E.2 Viewshed

Panoramic view and viewshed

View Shed

Low impact High impact

Visual aspects

E. 1 Description of the affected environment

The site in which the project components will be located covers an area of 10,000 ha. The visual setting in which the site is located is bordered to the south by the Pilanesberg range, to the west by a number of koppies running in a north-south line, to a distant mountain range on the horizon to the north and extends to the western horizon. (S.E.F. 2001:107)

E. 2 Topography

The dominant landscape type is the Clay Thorn Bushveld, which is characterised by a gently undulating almost flat topography dropping in altitude to the north. The site is located within the savannah biome, which consists of scattered trees and shrubs and a continuous ground layer dominated by grass species. (S.E.F. 2001:107)

E. 3 Views/Visibility

The views from the Pilansberg's south higher lying hills towards the site are extensive and uninterrupted for several kilometres. The views within the flat landscape of the site are restricted by the lack of elevated viewpoints. The landscape creates an uninterrupted view shed to the north that extends often beyond a distance of five kilometres. Any vertical object within this view shed is readily visible depending on its size and distance from the viewer. (S.E.F. 2001:107)

E. 4 The scale of the landscape

The vertical scale of the area is largely due to the definition of the Pilanesberg towards the south. The broad undulating valley, where very little vertical definition is evident, strengthens the horizontal scale of the landscape.
When viewed from the north relatively tall structures or changes to landform can be accommodated due to the presence of the backdrop created by the Pilanesberg to the south. (S.E.F. 2001:109)

Project structures which are elevated will become highly visible from viewpoints nearby because of the possibility of the project features breaking the skyline through silhouette or due to the visual contrast caused by the relatively flat and undulating landscape in especially the east-west lying valley landscape.

E. 5 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 include the area from which the project can be seen (the view-shed), 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 within established and existing planned land uses. (S.E.F. 2001:109)

E. 6 The View shed

The view-shed is a topographically defined area, which includes all possible observation sites from which the project will be visible. The boundary of the view-shed, 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. (S.E.F. 2001:109)

E. 7 The Viewing Distance

Visual distance zones can be defined by distances of 500, 1 000, 2 500 and 5 000 m from the project components. 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). The view of the project components would appear so small from a distance of 5000 m 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 m or less would be at its maximum. (S.E.F. 2001:109)

E. 8 Visual Absorption Capacity

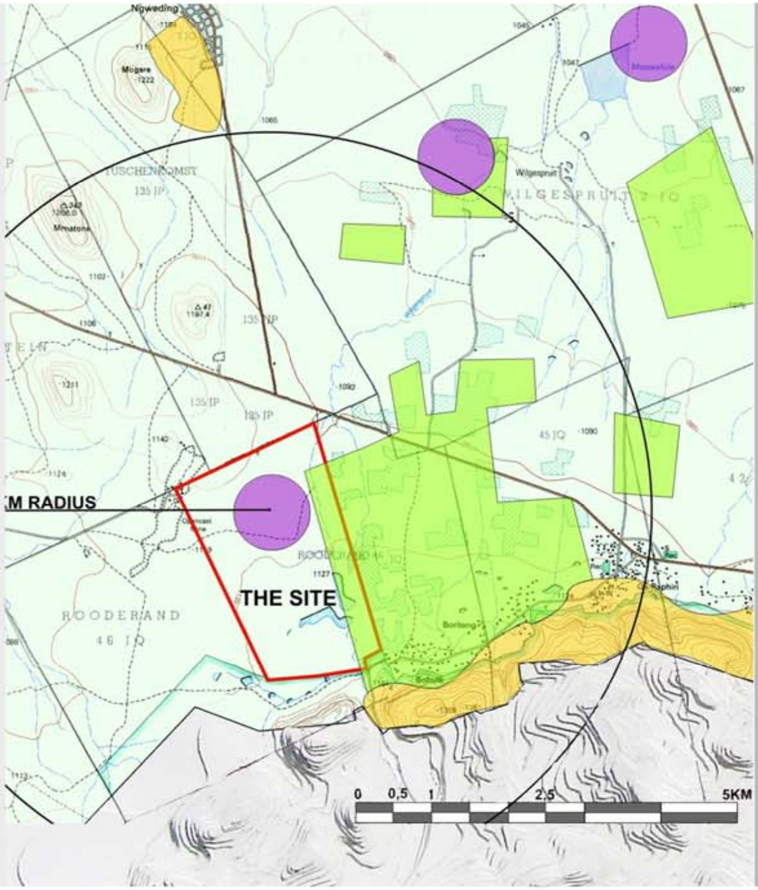
The visual absorption capacity (VAC) is a measure of the landscape's ability to visually accept / accommodate or embrace a development. Areas, which have a high visual absorption capacity, are able to easily accept objects so that their visual impact is less noticeable. Conversely areas with low visual absorption capacity will suffer a higher visual impact from structures imposed on them. (S.E.F. 2001:109-110)

E. 8.1 Visual Absorption Capacity (VAC) factors and their numerical values

VAC Factor		Categories		
Slope	Range Numeric al Value VAC	0-3 % 3 Low	3-7 % 2 Moderate	> 7 % 1 High
Vegetation Height	Range Numeric al Value VAC	< 1 m 3 Low	1-5 m 2 Moderate	5 m 1 High
Visual Pattern	Descripti on Numeric al Value VAC	Uniform 3 Low	Moderate 2 Moderate	Divers e 1 High

Table E.1 Visual absorption capacity factors and numerical values

It is concluded that the VAC of the study area as a whole is Moderate to Low while that of the dominant landscape type, the Clay Thorn Bushveld is Low. The VAC of the Agricultural and Fallow land sub-type is Low while that of the Peri-urban landscape is High.



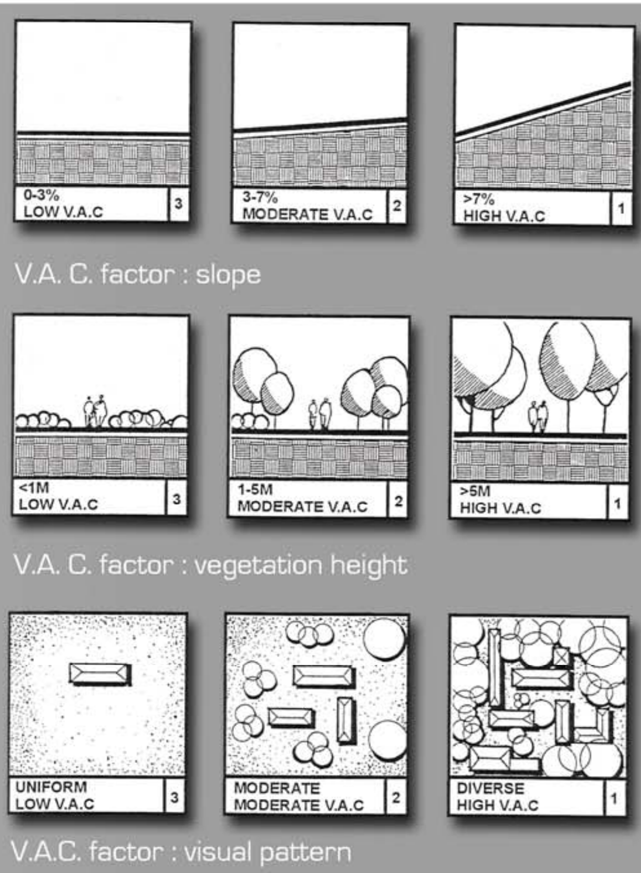


Figure E.3 Landscape types

Figure E.4 V.A.C. factors

- Clay Thorn Bushveld
- Peri-urban
- Agricultural and Fallow Land
- Decline Shafts

Landscape types

E. 8.2 Landscape type VAC factors

Landscape Types	VAC Factors		
	Slope	Vegetation Height	Visual Pattern
Study Area	3 (Low)	2 (Moderate)	2 (Moderate)
Clay Thorn Bushveld	3 (Low)	2 (Moderate)	3 (Low)
Agricultural and fallow lands	3 (Low)	3 (Low)	3 (Low)
Peri-urban	1 (High)	2 (Moderate)	2 (Moderate)

Table E.2 Landscape type VAC factors

The Kruidfontein Project will exert a negative impact on the visual environment. This is largely due to:

- High visibility of construction activity within a zone of uniform visual pattern;
- The low visual absorption capacity of the setting which is attributable to:

1. Relatively flat topography;
2. the low vegetation height (less than one meter);
3. The lack of visual diversity;
4. A general lack of rising landforms as a backdrop, although the Pilanesberg to the south will act as a backdrop.
5. The size of the operations will expose it to many viewers;
6. The need to cut across or expose the existing landform to accommodate the surface infrastructure; and
7. The height of the project components such as the waste rock dumps, processing plant and tailings dam could be dominant in the landscape.

(S.E.F. 2001:113)

This impact is a function of subjective factors. These subjective factors are based on the cultural and experiential associations of the viewers as well as the value they place on the visual environment over other social and biophysical considerations.

E. 9 Impact of vertical structures and general mine infrastructure

Structures in the processing plant that have a vertical dimension of more than three to five metres will become increasingly visible from nearby viewpoints as their visibility increases with decreasing distance, since they would extend above the skyline in the relatively flat and undulating landscape.

Mine infrastructure and facilities that have vertical dimensions greater than five metres include:

- Single storey buildings of approximately 6 or more m high (office, workshop);
- Power lines with pylons of up to 10 m high;
- Silo's of 25 m in height;
- Tailings dam from 4 m to 25 m above natural ground level;
- Waste rock dumps up to 25 m high; and
- Stockpiles of overburden that may exceed 10 m in height.

The vertical features associated with the proposed Rooderand mine such as the tailings facility, waste rock dumps and processing plant infrastructure will greatly modify the landscape characteristics of the immediate area. (S.E.F. 2003:5.60)

E. 10 Mitigation measures of vertical structures and general mine infrastructure during operational phase

1. The project components with vertical dimensions exceeding 15m should be avoided on the farm Rooderand 46 JQ or located in a relatively low lying portions as the topography of the site is elevated relative to the surrounding area;
2. The land forming and planting design of the project needs to respect the surrounding indigenous vegetation. The interface between new planting and the existing should be gradually blended. Plant material should tend more towards local indigenous species of trees and grassland;
3. The building forms must be broken by roof overhangs and steps in the façade. This will create shadow lines, which in turn assist in the mottling or breaking up of the visible plant and other infrastructure;
4. To limit the visual impact of the project on the adjacent community and from the roads close to the site, screening berms need to be well maintained from material removed from the site. Where feasible, the use of waste material for screening berms should be considered. These berms must be of sufficient height, be graded at a slope of 1:3 on both sides and be vegetated with indigenous vegetation. To be effective, the berms should be constructed as close as possible to the viewer. The forms of the berms should be organic (non geometric);
5. Screen the plant and other infrastructure from the surrounding roads and properties using existing undisturbed trees and undergrowth, and where practical, by planting additional trees and shrubs using species that occur locally;
6. The design should make provision for accent lighting that will be directed downwards to prevent light spill skywards;
7. Colours of the infrastructure must be matt, not glossy so as to reduce reflection and glare from the surfaces. This is important when considering the night scene and reflective light.

(S.E.F. 2003:5.66-5.66)

E. 11 Current Mitigation measures of vertical structures and general mine infrastructure during decommissioning phase

1. Dismantling of mine infrastructure, including the buildings;

2. Shaping of the soil profile within the mining area to blend in with the surrounding topography;
3. Modify the form of the tailings dam, through cut and fill operations, to arrive at a 'natural' topographical profile that is in keeping with nearby elevated topographical features;
4. Covering the dam and mining area with topsoil prior to establishing vegetation.

(S.E.F. 2003:6.15-6.16)

On closure of the mine the only structures that will remain will be the vegetated tailings dam and buildings that can be utilised.

Conclusion

The Kruidfontein project is characterised by an almost flat undulating topography with uninterrupted views for several kilometres over the landscape. Except for the backdrop that the Pilanesberg will provide from the northern viewpoint, it is evident that the visual impact of the mine will be moderate to high from the surrounding areas.

Although general mitigation measures for visual impacts of mining activities exist, these measures are still more concerned with minimising the visual intrusion by physical barriers, such as trees and berms, than investigating new approaches towards more aesthetically pleasing structures. This implies that mining companies will rather take the path of least resistance, than address the root of the problem.

With this information in mind it is imperative to design facilities and landscapes in such a way that they are able to adopt to the specific environment, taking into account visual traits of the area like, materials uses, building heights, the surrounding environment, cultural context and the facilities' end land use. The design should thus visually enhance the end land use whilst accommodating the temporary mining operations, rather than screen function specific mining facilities.