SPECIALIST VEGETATION/ECOLOGICAL SURVEY FOR MR. F. MALHERBE.
ERF 3 ROBERTSON PROPERTY INVESTMENT (PTY) LTD.
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CELL 082 565 9400

DEVELOPMENT OF A RESIDENTIAL AREA
ERF 3 ROBERTSON

PREPARED BY IAN OLIVER

ON 29 SEPTEMBER, 2006

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1. Executive Summary

An ecological assessment was conducted on behalf of Mr Febbie Malherbe, the owner of erf no. 3 Roberson. The survey was undertaken in the magisterial area of Robertson, district of Robertson, Western Cape Province. The field survey was undertaken on 17 September, 2006.

The client is Mr Febbie Malherbe P.O. Box 71 Malmesbury 7299. The purpose is to undertake a vegetation/ecological survey on this land. In addition to the ecological survey, management plans and strategies will be drawn up in order to mitigate (soften) the impact on the indigenous vegetation, prior to any urban development activities. The area earmarked for development is 11.77ha in extent. The area is approximately 1.5kms west of the town of Robertson.

The survey area falls within the Cape Floristic Region (CFR) winter rainfall area. The site is situated in the Breede river valley – Robertson district. The veld type is classified as Robertson Karoo - with a slight influence of Breede Shale renosterveld. The Robertson Karoo vegetation type is classified as least threatened (LT).

For the most part, the survey area falls into the following ecosystem:

1. Succulent Karoo Ecosystem.
### Table 1.1:

**Impact significance ratings – Erf 3 Robertson – Robertson District**

<table>
<thead>
<tr>
<th>Impact</th>
<th>Consequence</th>
<th>Probability</th>
<th>Significance</th>
<th>Status</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impact 1.</strong> Loss of floral species <strong>Without mitigation</strong></td>
<td>Very High</td>
<td>Possible</td>
<td><strong>High</strong></td>
<td>Negative</td>
<td>Medium</td>
</tr>
<tr>
<td><strong>With mitigation</strong></td>
<td>High</td>
<td>Possible</td>
<td><strong>Medium</strong></td>
<td>Negative</td>
<td>Medium</td>
</tr>
<tr>
<td><strong>Impact 2.</strong> Loss of veg type <strong>Without mitigation</strong></td>
<td>Medium</td>
<td>Possible</td>
<td><strong>Low</strong></td>
<td>Negative</td>
<td>Medium</td>
</tr>
<tr>
<td><strong>With mitigation</strong></td>
<td>Medium</td>
<td>Possible</td>
<td><strong>Low</strong></td>
<td>Negative</td>
<td>Medium</td>
</tr>
<tr>
<td><strong>Impact 3.</strong> Loss of habitat – urban dev. <strong>Without mitigation</strong></td>
<td>High</td>
<td>Possible</td>
<td><strong>Medium</strong></td>
<td>Negative</td>
<td>Medium</td>
</tr>
<tr>
<td><strong>With mitigation</strong></td>
<td>Medium</td>
<td>Possible</td>
<td><strong>Low</strong></td>
<td>Negative</td>
<td>Medium</td>
</tr>
<tr>
<td><strong>Impact 4.</strong> Loss of fauna inc reptiles <strong>Without mitigation</strong></td>
<td>High</td>
<td>Possible</td>
<td><strong>Medium</strong></td>
<td>Negative</td>
<td>Low</td>
</tr>
<tr>
<td><strong>With mitigation</strong></td>
<td>Medium</td>
<td>Possible</td>
<td><strong>Low</strong></td>
<td>Negative</td>
<td>Low</td>
</tr>
</tbody>
</table>
2. Introduction

This specialist vegetation/ecological assessment was conducted on behalf of Mr Febbie Malherbe P.O. Box 71 Malmesbury 7299 of Erf 3 Robertson Property Investment (Pty) Ltd. The survey was undertaken in the magisterial area of Robertson, Western Cape Province. The field survey was undertaken on 17 September, 2006.

The total area of the land earmarked for urban development (township development) is 11.77ha. The global positioning of the site situated in a central position is S33 47 50.0 and E19 52 15.5. The altitude is 213m above sea-level.

The survey site falls within the Breede River valley. The Langeberge mountains are dominant in the landscape to the north and northeast of the proposed development. The Breede river lies to the south and southeast of the proposed development.

The floral biodiversity on the site was assessed. In total seventy-four (74) species growing on the site were identified. It is estimated that the number of plants on site is somewhat higher. Of these, twelve (12) are geophytes and thirty (30) are succulents. The remainder comprise of herbaceous perennials and low karroid shrubs.

The major part of the vegetation (95%) on the site is Robertson Karoo. This vegetation type is considered as least threatened (LT). There is also a very small element (5%) of Breede Shale renosterveld present. This vegetation exists more in an ecotone phase. Breede Shale renosterveld is considered vulnerable (VU).

The major vegetation type is listed under the Succulent Karoo ecosystems.
3. Terms of reference for the studies

The terms of reference for this study are as follows:

- Conduct vegetation and plant species surveys noting their conservation significance and status. Example: occurrence of any rare & endangered species (threatened plants) or localized endemics.
- Assess the potential impacts and associated land transformation.
- Ecological/landscape pattern, e.g. a seasonal wetland, stream or rocky slopes that may be impacted upon by the proposed landfill development.
- Recommend appropriate and practical mitigation measures to minimize the negative impacts and maximize potential benefits associated with the site.
- Include (where possible) a full botanical site inspection.
- Identify the vegetation types, using the latest known vegetation classifications available.
- Include (if necessary) individual checklists of plant species found on and in the immediate vicinity of the study areas concerned.
- Include impact rating methodology tables (impact assessment tables).
- Make recommendations to mitigate the likely impacts on the vegetation and surrounding area.
- Indicate the condition of the land, plus current or previous land usage.
- Make use of photographs, maps, GPS coordinates etc to illustrate any important issues.
4. Methodology

These studies were based on one site visit. An ecological site visit and assessments were undertaken on Sunday, 17 September, 2006. The purpose of the physical inspections was to establish the following:

1. The condition of the vegetation on the proposed site. Is the vegetation either disturbed or degraded?
2. Is the condition of the vegetation pristine?
3. The species diversity. This refers to the numbers of different indigenous plants (species) occurring on each site. Indigenous fauna will be noted based on faunal species occurring at the Karoo Desert NBG in Worcester.
4. Red Data species occurring on the site. This would include near threatened or rare plants and animals (where possible).
5. Fatal flaws. These would include finding any rare or threatened fauna or flora that would impact negatively on the local environment in such away as to put a stop to any land development.
6. Identification of the vegetation type(s) on the site. This would include trying to establish the known range of a vegetation type and whether or not this vegetation is less threatened (LT), vulnerable (VU), endangered (EN) or critically endangered (CR).

Based on knowledge of the local flora, fauna and vegetation types, the site was examined. The latest floristic taxonic literature and reference books were used for the purpose of this specialist study. In addition, information on the latest classification of vegetation types (Ladislav, M., Rutherford and Powrie, 2004) was used, including information pertaining to land usage of the various vegetation types where the sites are situated.

Plant communities and individual plant species that are growing within the study areas were examined. Any plants classified as rare or endangered in the Red Data List of southern African Plants, Craig Hilton-Taylor, 1996 are highlighted and noted.

Based on all the relevant information, for example, digital photographic site images, floral images, vegetation maps, 1: 50 000 topographical maps – the ecological vegetation assessment report was compiled.
5. Erf 3 – Robertson

The proposed site is approximately 1.5 kilometers west of Robertson and approximately 45.0 kms east of Worcester. The site is situated on a gentle south facing aspect (slope). The proposed urban development overlooks the Wilem Nels river and the town of Robertson to the east and northeast. The Wilem Nels river for the most part is heavily encroached on by alien vegetation – mainly in the form of *Eucalyptus* species and *Acacia saligna*.

The proposed site is wedged in between the town of Robertson and farm lands. The veld in places is basically in a good condition. The veld is typically karroid in its composition. There is evidence of dumping of building rubble just above the old farm (lower central position on site). To the southeast of the old farm dam is an old grazing area/pastureland – approximate size 2 –3 ha.

The vegetation on the site is classified as Robertson Karoo. This vegetation type is rated as least threatened (LT). The condition of the veld is fair to good. There is a network of paths that criss-cross the site. There is evidence of a small earthen canal that runs from south to north on the site.

For the most part low growing karroid shrubs are common on the proposed housing site. Some common karroid shrubs include the following *Dicerothamnus rhinocerotis* (renosterbos), *Lebeckia cytsiodes* (wild sweetpea), *Eriocephalus africanus* (Kapokbos), *Euclea undulata* (Ghwarriebos), *Lycium oxypetalum* (Wolwedoing), *Oedera capensis* and *Hetrolepis alinea* (Klipgousblom).

Succulent plants are the most dominant on the proposed housing site. They included *Lampranthus, Drosanthemum, Crassula* and *Euphorbia*. In the case of family *Crassulaceae* eleven genera were counted. Of this nine were *Crassula* species. A number of annuals were seen, including *Ursinia anthemoides* (Oranje Daisy). See plant check list for comprehensive list of plants.

Smaller reptiles on site could include the Padlopers (*Homopus species*) and Ploegskaarskipad (*Cherisina angulata*). It is possible that the Robertson Dwarf Chameleon (*Brachypodion specie*) occurs in the low karroid bushes on the site. Some smaller antelope, for example Kapse Gysebok, could occur in that area.
The specific vegetation in question is known as Robertson Karoo. This veld type is considered the least threatened (LR). This vegetation type falls within the Succulent Karoo ecosystem.

No rare or local endemic species were seen during the site inspection carried out on 17/09/2006.

**Ecological/landscape patterns** indicate that the proposed site slopes gently from west to east. To the east of the proposed development lies the Wilem Nels river. During heavy rains this small river is known to burst its banks (Dec 2004). To the north (approximately 8kms) lies the Langeberge. To the south (approximately 4kms) lies the Breede river.

From a **floral biodiversity** point of view the significance rating is medium (with management actions) to high (without management actions). From a **Robertson Karoo ecosystem** point of view, the significance rating is low (with mitigation) and low (without mitigation). See full ecological impact assessment tables with and without management actions. See tables 5.1. - 5.4.

**5.1. Assumptions, limitations and gaps in information**

- From a floral diversity point of view, it would be informative to know what plant species, with special reference to geophytes (bulbs), grow on this site during the autumn season. This is with particular reference to amaryllids (bulbs). Even though no Amaryllids were seen they are more than likely to occur in the area.
- Information on mammals & reptiles is based on what occurs in the Worcester area, 40 kilometres away.
- Due to the cool weather, no tortoises were seen during the site inspection – warmer weather would have been better for tortoise spotting.
5.2. Mitigating actions – Erf 3 Robertson

- That the plants of the following succulents are collected *Aloe microstigma, Tylecodon paniculatus, Haworthia pumilo, Gasteria disticha* and selected *Crassulas* are removed and relocated to the Karoo Desert National Botanical Garden – Worcester, where they can be planted either in the index collections or in the garden for all to enjoy and appreciate. **Essential.**

- That geophytes with special reference to the following genera, *Babiana, Bulbine, Bulbinella* and *Albuca* are removed and relocated to the Karoo Desert National Botanical Garden – Worcester, where they can be planted either in the index collections or in the garden for all to enjoy and appreciate. **Essential.**

- That cuttings are taken of *Pelargonium trifida* and *Cotyledon orbiculata*. These cuttings would be propagated and planted at the Karoo Desert National Botanical Garden in Worcester. **Optional.**

- Any tortoises or other reptiles found should be relocated to places of safety and not harmed in any way. If work is done in summer, tortoises are very evident. The Tortoise Farm Nature Reserve is situated nearby (on the Wolseley to Worcester road) and any rescued tortoises should be taken to this place of safety where they will be relocated at a later stage. All persons should be sensitised to the fact that they are working on or near farms and ALL fauna and flora must be treated with respect. **Essential.**

- That special care be taken in terms of the Robertson Dwarf Chameleon (*Brachypodion specie*). Any Chameloens seen must be caught and relocated to a similar habitat. Under no circumstances should they be harmed. **Essential.**

- That no damage be done to the old Kruithuis (powder house) which is situated on the south east corner of this proposed development. **Essential.**

- Extreme care **MUST** be taken that no cooking fires are made by any staff or contractors tasked with possible land clearing. The major fire threat is in summer. Much of the surrounding vegetation is of a resinous nature (turpentine-like) and thus burns very easily. This is especially relevant to the adjacent Langeberg mountains and conservancy areas. **Essential.**

- There should be no trapping of any wild animals, with special reference to the adjacent natural areas. **Essential.**

- There may be no harvesting allowed of any indigenous plant material outside the demarcated site. **Essential.**

- No damage to or unlawful harvesting of fruit from the surrounding farms may take place. **Essential.**
Table 5.1:
Floral species on erf 3 – Robertson
Impact assessment *without & with* management actions

<table>
<thead>
<tr>
<th>Actions</th>
<th>Impact</th>
<th>Extent</th>
<th>Intensity</th>
<th>Duration</th>
<th>Consequence</th>
<th>Probability of occurrence</th>
<th>Significance</th>
<th>Status</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without actions</td>
<td>Loss of floral species</td>
<td>Regional 2</td>
<td>High 3</td>
<td>Long term 3</td>
<td>Very High 8</td>
<td>Possible</td>
<td>High</td>
<td>Neg</td>
<td>Med</td>
</tr>
<tr>
<td>With actions</td>
<td>Loss of floral species</td>
<td>Regional 2</td>
<td>Med 2</td>
<td>Long term 3</td>
<td>High 7</td>
<td>Possible</td>
<td>Med</td>
<td>Neg</td>
<td>Med</td>
</tr>
</tbody>
</table>

Table 5.2:
Loss of vegetation type (Robertson Karoo)
Floral species on Erf – Robertson
Impact assessment *without & with* management actions

<table>
<thead>
<tr>
<th>Actions</th>
<th>Impact</th>
<th>Extent</th>
<th>Intensity</th>
<th>Duration</th>
<th>Consequence</th>
<th>Probability of occurrence</th>
<th>Significance</th>
<th>Status</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without actions</td>
<td>Loss of veg type</td>
<td>Regional 2</td>
<td>Low 1</td>
<td>Long term 3</td>
<td>Med 6</td>
<td>Possible</td>
<td>Low</td>
<td>Neg</td>
<td>Med</td>
</tr>
<tr>
<td>With actions</td>
<td>Loss of veg type</td>
<td>Regional 2</td>
<td>Low 1</td>
<td>Long term 3</td>
<td>Med 6</td>
<td>Possible</td>
<td>Low</td>
<td>Neg</td>
<td>Med</td>
</tr>
</tbody>
</table>
### Table 5.3:
Land transformation phase (housing complex) Erf 3 – Robertson
Impact assessment **without & with** management actions

<table>
<thead>
<tr>
<th>Actions</th>
<th>Impact</th>
<th>Extent</th>
<th>Intensity</th>
<th>Duration</th>
<th>Consequence</th>
<th>Probability of occurrence</th>
<th>Significance</th>
<th>Status</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without actions</td>
<td>Loss of habitat</td>
<td>Regional 2</td>
<td>Med 2</td>
<td>Long term 3</td>
<td>High 7</td>
<td>Possible</td>
<td>Med</td>
<td>Neg</td>
<td>Med</td>
</tr>
<tr>
<td>With actions</td>
<td>Loss of habitat</td>
<td>Regional 2</td>
<td>Med 2</td>
<td>Long term 2</td>
<td>Med 6</td>
<td>Possible</td>
<td>Low</td>
<td>Neg</td>
<td>Med</td>
</tr>
</tbody>
</table>

### Table 5.4:
Loss of fauna inc reptiles Floral species on erf 3 – Robertson
Impact assessment **without & with** management actions

<table>
<thead>
<tr>
<th>Actions</th>
<th>Impact</th>
<th>Extent</th>
<th>Intensity</th>
<th>Duration</th>
<th>Consequence</th>
<th>Probability of occurrence</th>
<th>Significance</th>
<th>Status</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without actions</td>
<td>Loss of fauna inc reptiles</td>
<td>Regional 2</td>
<td>Med 2</td>
<td>Long term 3</td>
<td>High 7</td>
<td>Possible</td>
<td>Med</td>
<td>Neg</td>
<td>Low</td>
</tr>
<tr>
<td>With actions</td>
<td>Loss of fauna inc reptiles</td>
<td>Regional 2</td>
<td>Low 1</td>
<td>Long term 3</td>
<td>Med 6</td>
<td>Possible</td>
<td>Low</td>
<td>Neg</td>
<td>Low</td>
</tr>
</tbody>
</table>
9. Conclusions and Recommendations

Mitigating (management) considerations have been given in order to soften the effect of the proposed land transformation development of ten hectares of land destained for town housing development.

The area in question falls within the Robertson Karoo vegetation type. This vegetation type is considered the least threatened (LT) vegetation type in comparison to other vegetation types. Least threatened (LT) vegetation types can be classified as follows: ecosystems that have lost only a small proportion of their original natural habitat and are largely intact. This veld type falls within the Succulent Karoo ecosystem.

Just over seventy-four (74) terrestrial plant species were identified. Twelve (12) of those seen during the physical survey are geophytes (bulbs). The plant group with the highest number is succulents of which there are thirty species (30). This represents 40% of the total number. It is quite possible that this figure could be slightly higher. What is important is that certain bulb and succulent species (as indicated in the mitigating actions) should be removed and planted at the Karoo Desert National Botanical Garden in Worcester. Any seed removed/harvested would go to the Karoo Desert National Botanical Garden in Worcester and the Millennium Seed Bank (MSB) in the United Kingdom. The MSB is keeping a repository of wild seeds for future generations in case certain species become extinct.

The area where the proposed housing development would take place, is to a greater extent isolated by farms and the town of Robertson. There are other areas of Robertson Karoo that are larger and are in a far more pristine condition. Thus development of this small area would in no way impact negatively on the larger picture of this vegetation type.

The significance of the impact is, in most cases, rated high to medium without management actions. The significance in terms of loss of plant species (flora) is rated as high without management actions.

In terms of management actions the significance is rated as low in three tables. The loss of plant species (flora) is rated medium with management actions.

No threatened plant species were seen during the physical surveys conducted on 17 September, 2006.
10. References


Sunday, 24 September, 2006
Appendix 1: Maps

Map No. 1
1:50 000 TOPO Map. Location of proposed – 10.77ha land Erf 3 Robertson.
Map No. 2

Erf Number 3 - Robertson

- Farm with vines & fruit trees
- Alien vegetation
- Cemetery
- Old paddock
- Evidence of dumping rubble
- Wilem Nels river
- DAM
- Alien vegetation

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Robertson
Appendix 2: Plant Checklist

Acacia karroo
Adromischus filicaulis
Albuca cooperi
Albuca fragrans
Albuca maxima
Aloe microstigma
Anacampseros telephiasstrum
Anisodonteaelegans (white form)
Antimima mucronata
Arctotheca calendula
Aspalathus spinosa
Asparagus retrofractus
Babiana stricta
Bulbinella caudelifilis
Bulbine succulenta
Carissa haematocarpa
Chrysocoma incana
Cotyledon orbiculata
Crassula atropurpurea
Crassula congesta
Crassula cotyledonis
Crassula muscosa
Crassula nudicaulis
Crassula perforata
Crassula subaphylla
Crassula tetragona
Cynella lutea
Dicerathomnus rhinocerotis
Drosanthemum floribundum
Drosanthemum speciosum
Drosanthemum striatum
Drimia capensis
Duvalia caespitosa
Eriocephalus ericoides
Eriospermum capense
Euclea undulata
Euphorbia burmannii

Euphorbia mauritanica
Euryops rehmanii
Felicia filifolia
Galenia africana
Gasteria disticha
Haworthia pumilo
Heliophila carnosa
Hermannia cunnifolia
Hesperantha falcate
Hetrolepis alinea
Lampranthus caespitosus complex
Lebeckia cytisiodes
Lycium oxycarpum
Massonia depressa
Moraea specie
Oedera capensis
Oxalis species
Pelargonium alternans
Pelargonium trifidum
Phyllobolus canaliculatus
Pteronia incana
Rhus laevigata
Rhus glauca
Ruschia multiflora
Sarcostemma virminale
Satyrium erectum
Selago glutinosa
Senecio radicans
Senecia sarcoides
Stoebe plumose
Sutera specie
Tetragonia fruticosa
Tetragonia specie
Trachyandra flexifolia
Tylecodon paniculatus
Ursinia antheloides
Zygophyllum sessilifolium
Appendix 3: Photos

Photo No. 1
Photo taken 17 September, 2006 – Erf 3 Robertson
Looking north towards the Langeberge mountains

Photo No. 2
Photo taken 17 September, 2006 – Erf 3 Robertson
Looking south towards Nkgbelo.
Photo No. 3
Photo taken 17 September, 2006 – Erf 3 Robertson.
Looking west the reservoir on top of the hill with populations of *Aloe microstigma* in foreground.

Photo No. 4
Photo taken 17 September, 2006 – Erf 3 Robertson
Looking east towards the cemetery and Robertson
Photo No. 5

Photo taken 17 September, 2006 – Erf 3 Robertson
*Aloe microstigma* (aalwyn) & *Hetrolepis alinea* (klipgousblom).

The aloes should be removed & planted on other suitable sites.

![Photo No. 5](image)

Photo No. 6

Photo taken 17 September, 2006 – Erf 3 Robertson.
*Pelargonium trifidum* – cutting material can be collected and taken to the Karoo Desert NBG in Worcester for cultivation and incorporation into the garden plantings.

![Photo No. 6](image)
Photo No. 7

Photo taken 17 September, 2006 – Erf 3 Robertson.
Land disturbance – evidence of dumping rubble with small dam in background.