Appendix G – Specialist Studies

Appendix G1 – Botanical Statement/Scan

PB CONSULT
ENVIRONMENTAL MANAGEMENT SERVICES

BOTANICAL STATEMENT

CALCUTTA MEMORIAL PARK, STELLENBOSCH

PROPOSED ESTABLISHMENT OF A MEMORIAL PARK ON THE REMAINDER OF FARM CALCUTTA NO. 29, STELLENBOSH LOCAL MUNICIPALITY, WESTERN CAPE PROVINCE.

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SUMMARY - MAIN CONCLUSIONS

Stellenbosch Municipality is in urgent need to establish additional communal cemeteries to service the larger Stellenbosch Municipal area. Various sites were evaluated, of which the Farm Calcutta No. 29 was identified (after preliminary discussions with CapeNature) as a potential suitable site.

According to the 2012 (beta 2) version of the Vegetation map of SA (Mucina & Rutherford, 2006) the site is located within an area that historically would have been covered by Swartland Shale Renosterveld (Figure 2), a critically endangered vegetation type in terms of *"List of ecosystems that are threatened and in need of protection"* (GN 1002, December 2011). However, land use and other spatial data indicated that the site is likely to be degraded and planted to woodlots. The site visit confirmed that the property is basically transformed as a result of alien infestation and other historical practices.

According to the Stellenbosch spatial dataset of the WCBSP (Figure 3), Calcutta overlaps a proposed critical biodiversity area (Class 2) to the west of the small stream, an ecological support area (Class 2) associated with the small stream crossing the property and a terrestrial ecological support area (Class 2) associated with the area to the east of the small stream. In this case the ecological support areas associated with the small seasonal stream are potentially the only feature of significance remaining. Both the CBA to the west and the ESA to the east of this little stream have been degraded to the point of being transformed. Connectivity is also mostly compromised, but with sensible planning the Calcutta site may still play a role as an potential ecological corridor (even though it is highly unlikely to ever be able to revert this area back to natural or near natural).

According to the 2013-2014 National land cover dataset, the property is covered by mature plantations or woodlots to the east of the small stream, while the areas west of the stream is likely to still be covered in shrubland fynbos. The site visit confirms that the area to the east of the small stream is covered by dense alien invasive species (consistent with the National Land cover map), but the area to the east of the stream is has been degraded to an open grassland with no more shrubland or fynbos elements remaining (Refer to Picture 1 & 2).

The site visit confirmed that the Calcutta property is overgrown by a dense mix of alien invasive plant (AIP) species, dominated by *Eucalyptus* species and Port Jackson (*Acacia saligna*). No natural vegetation was encountered, apart from a few hardy remaining shrubs and sedges, which was mostly associated with the small seasonal stream. Apart from the dense stand of invasive species the site also showed a multitude of other disturbances, including sand mining activities, dumping and harvesting of fire wood (*Eucalyptus*) as well as individuals cutting fence poles.

Botanically speaking, the site is clearly degraded to the point of being transformed. Very few indigenous plant species remains on site (covering less than 5% of the area) and they were all hardy shrubs or pioneer species. It is considered unlikely that the natural veld will ever be able to re-establish itself on the site. The small seasonal stream is similarly degraded, with almost no riparian vegetation remaining. Ideally one should try to rehabilitate this stream and re-establish natural riparian vegetation. However, this will not happen under the current land use, but it is possible to make the stream a feature of the memorial park and to rehabilitate it to a more natural state.

Based on the current status of the site, it is considered unlikely that the proposed development will have any significant impact on indigenous vegetation or even national or provincial conservation targets.

INDEPENDENCE & CONDITIONS

PB Consult is an independent consultant and has no interest in the activity other than fair remuneration for services rendered. Remunerations for services are not linked to approval by decision making authorities and PB Consult have no interest in secondary or downstream development as a result of the authorization of this proposed project. There are no circumstances that compromise the objectivity of this report. The findings, results, observations and recommendations given in this report are based on the author's best scientific and professional knowledge and available information. PB Consult reserve the right to modify aspects of this report, including the recommendations if new information become available which may have a significant impact on the findings of this report.

RELEVANT QUALIFICATIONS & EXPERIENCE OF THE AUTHOR

Mr. Botes is a registered Professional Botanical, Environmental and Ecological Scientists at SACNASP (South African Council for Natural Scientific Professions) as required in terms of Section 18(1)(a) of the Natural Scientific Professions Act, 2003, since 2005 and holds a BSc. (Hons.) degree in Plant Ecology from the University of Stellenbosch (Nature Conservation III & IV as extra subjects).

Since qualifying with his degree, he had worked for more than 20 years in the environmental management field, first at the Overberg Test Range (a Division of Denel) managing the environmental department of OTB and being responsible for developing and implementing an ISO14001 environmental management system, ensuring environmental compliance, performing environmental risk assessments with regards to missile tests and planning the management of the 26 000 ha of natural veld, working closely with CapeNature (De Hoop Nature Reserve). In 2005 he joined Enviroscientific, an independent environmental consultancy specializing in wastewater management, botanical and biodiversity assessments, developing environmental management plans and strategies, environmental control work as well as doing environmental compliance audits and was also responsible for helping develop the biodiversity part of the Farming for the Future audit system implemented by Woolworths. During his time with Enviroscientific he performed more than 400 biodiversity and environmental legal compliance audits. During 2010 he joined EnviroAfrica in order to move back to the biodiversity aspects of environmental management. Experience with EnviroAfrica includes EIA applications, biodiversity assessment, botanical assessment, environmental compliance audits and environmental control work. During 2017, Mr. Botes started to work full time in his own small business (PB Consult) as an independent environmental specialist.

Yours sincerely,

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Registered Professional Botanical, Environmental and Ecological Scientist

CONTENTS

1. INTRODUCTION

Stellenbosch Municipality is in urgent need to establishing additional communal cemeteries to service the larger Stellenbosch Municipal area. EnviroAfrica CC was appointed to conduct a screening and environmental assessment of potential sites (5 in total), owned by the Stellenbosch Municipality that may be suitable for this purpose. The remainder of Farm Calcutta No. 29 was one of the potential sites evaluated.

During 2017 EnviroAfrica, did a biodiversity scan of the various sites (Refer to Botes, 2017) in order to determine, which of the proposed sites are potentially viable (which included preliminary input from CapeNature). The biodiversity scan indicated that Calcutta (Rem. Of Farm Calcutta No. 29) may be a potential viable option.

The biodiversity scan indicated that the area had been transformed over time and is covered by dense alien invasive species like *Eucalyptus* (Blue Gums) and *Acacia saligna* (Port Jackson). This view was supported by the latest BGIS land use maps and the 2014 National Land cover map describes the site as being mostly covered by mature woodlots. However, according to the Western Cape Biodiversity Spatial Plan (2017) the site overlaps potential degraded critical biodiversity areas as well as ecological support areas (associated with the small seasonal water course crossing the property. As a result, one of the recommendations of the biodiversity study and CapeNature was that a further botanical scan of the site is done in order to determine the botanical significance of the site.

A site visit was performed during January 2019, during which the site was walked and scanned for potential remaining botanical features of significance. Although the timing of the site visit was not great, in that most bulb species would have been past flowering (a spring site visit would have been preferable), it was clear that the site has been degraded to the point of been transformed in terms of botanical significance. Only the occasional hardy indigenous species like "taaibos" *Asparagus*, renosterbos and a few restioid species was occasionally encountered, mostly associated with the small seasonal stream. Even along the small seasonal stream, potential riparian vegetation has been almost totally replaced by alien invasive plant species. Apart from the alien infestation the site also shows various physical disturbances, like sand mining activities, dumping and other human related disturbances.

In short there remains almost no natural veld or plant species of significance and it is considered highly unlikely that the veld would ever recover, even if all the alien plants were to be removed.

1.1. TERMS OF REFERENCE

The terms of reference for this appointment were to:

- Give a short statement on the vegetation and its conditions encountered at the site and its immediate surroundings.
- Determine and record the position of any plant species of special significance (e.g. protected tree species, or rare or endangered plant species) that should be avoided or that may require "search & rescue" intervention.
- Make recommendations on impact minimization should it be required

1.2. LOCATION & LAYOUT

In this report the Calcutta property refers to the Remainder of the Farm Calcutta No. 29, Stellenbosch. The Calcutta property is located just of the R304, about 10km due north of Stellenbosch, within the Stellenbosch Local Municipal area of the Western Cape Province. The property is about 39.881ha in size (Refer to Figure 1).

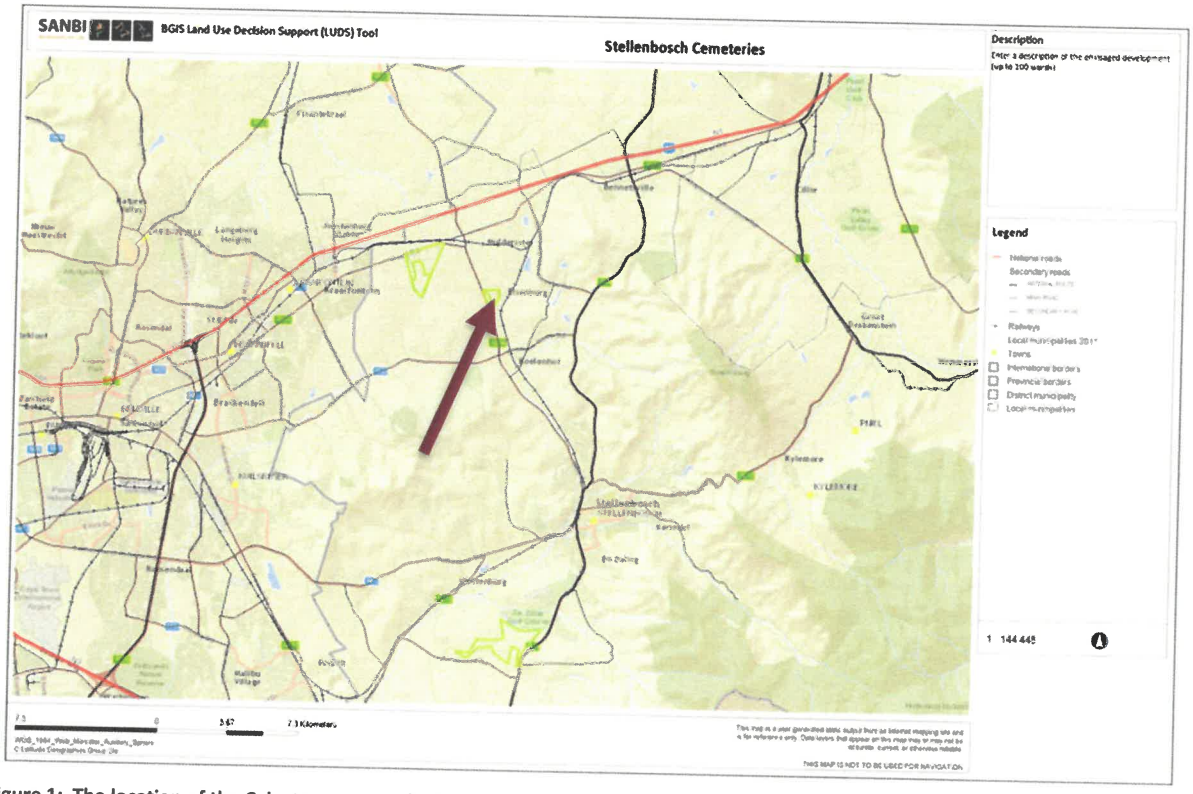

Figure 1: The location of the Calcutta property (indicated by the arrow) just north of Stellenbosch

The proposed memorial park is likely to cover all available land on the Calcutta property, but it was also taken into account that the layout of the memorial park can incorporate and accommodate various natural features (e.g. the small seasonal stream), which may even result in a beneficial impact over time.

1.3. EVALUATION METHOD

Desktop studies together with a site visit was performed to evaluate the proposed site in terms of potential impacts on botanical features of significance and to make recommendations on mitigation measures (should it be required). The site visit was conducted during January 2019. The timing of the site visit was not ideal, since most of the potential remaining bulb species would have been past flowering. Non-the-less, the site is so degraded that it is considered highly unlikely that any significant plant species would have survived.

2. THE VEGETATION

According to the 2012 (beta 2) version of the Vegetation map of SA (Mucina & Rutherford, 2006) the site is located within an area that historically would have been covered by a vegetation type known as Swartland Shale Renosterveld (Figure 2). Swartland Shale Renosterveld is classified as a critically endangered vegetation type in terms of "*List of ecosystems that are threatened and in need of protection*" (GN 1002, December 2011), promulgated in terms of the National Environmental Management Biodiversity Act, Act 10 of 2004.

Mucina & Rutherford (2006) describe Swartland Shale Renosterveld as low to moderately tall leptophyllous shrubland of varying canopy cover as well as low, open shrubland dominated by renosterbos. Heuweltjies (old termite mounts) are a very prominent feature of this environment.

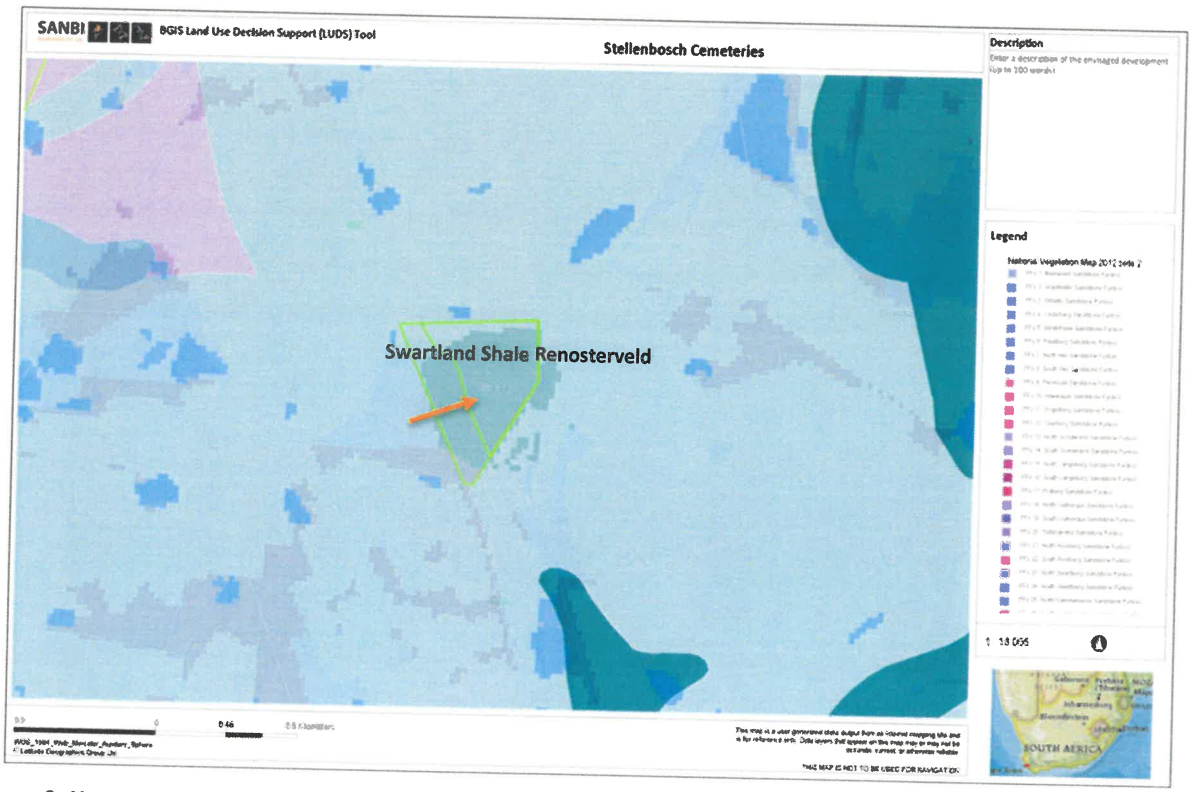

Figure 2: Vegetation map of South Africa (Mucina, Rutherford & Powrie, 2005) showing the property location

3. WITZENBERG CRITICAL BIODIVERSITY MAP

The 2017 Western Cape Biodiversity Spatial Plan (WCBSP) includes a map of biodiversity importance for the entire province, covering both the terrestrial and freshwater realms, as well as major coastal and estuarine habitats (Pool-Stanvliet, 2017). The WCBSP is the product of a systematic biodiversity plan that delineates, on a map, Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), which require safeguarding to ensure the continued existence and functioning of species and ecosystems, including the delivery of ecosystem services.

According to the Stellenbosch spatial dataset of the WCBSP (Figure 3), Calcutta overlaps a proposed critical biodiversity area (Class 2) to the west of the small stream, an ecological support area (Class 2) associated with the small stream crossing the property and a terrestrial ecological support area (Class 2) associated with the

area to the east of the small stream. The Western Cape Biodiversity Spatial Plan describes these features as follows:

- ESA2: Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services. The aim must be to restore and/or manage to minimize impact on ecological processes and ecological infrastructure functioning, especially soil and water-related services, and to allow for faunal movement.
- CBA2: Areas in a degraded or secondary condition that is required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure. The aim should be to maintain them in a natural or near-natural state, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land-uses are appropriate.

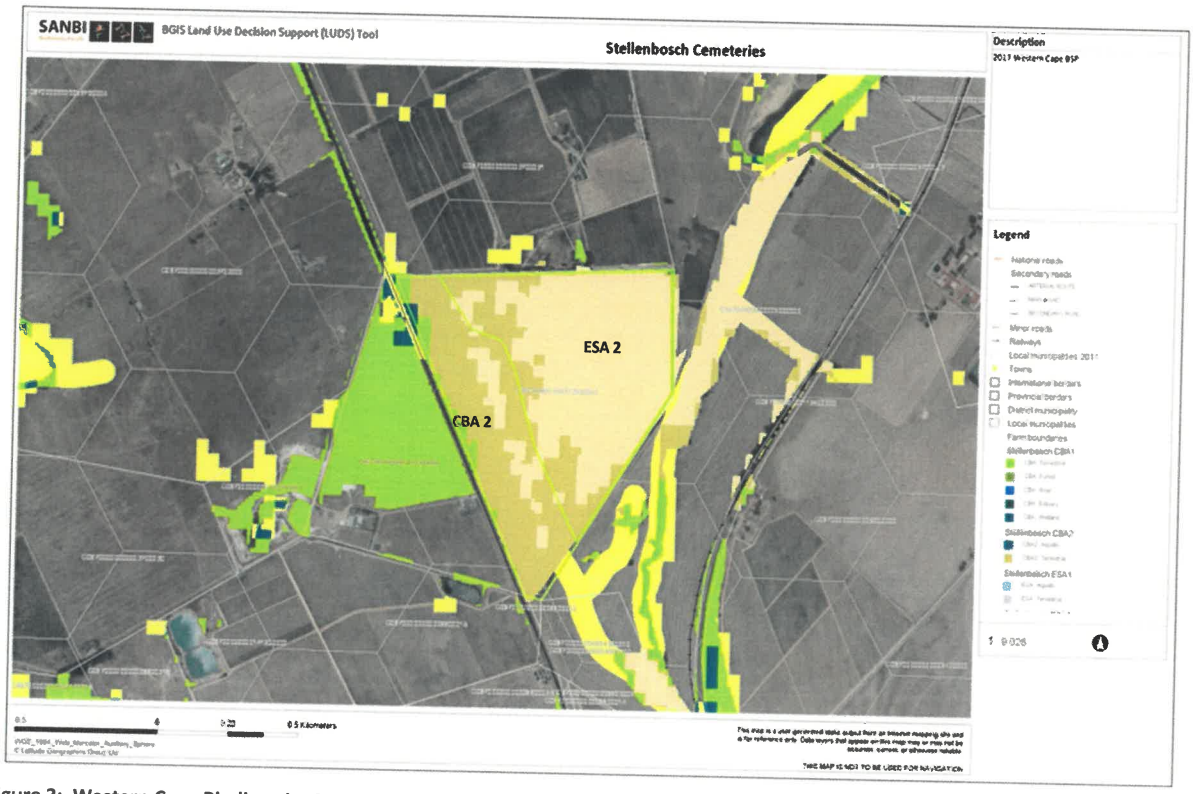

Figure 3: Western Cape Biodiversity Spatial Plan (2017) indicating the site location

In this case the ecological support areas associated with the small seasonal stream is potentially the only feature of significance which may be potentially restored. Both the CBA to the west and the ESA to the east of this little stream has been degraded to the point of being transformed. Connectivity is also mostly compromised, but with sensible planning the Calcutta site may still play a role as an potential ecological corridor (even though it is highly unlikely to ever be able to revert this area back to natural or near natural).

4. NATIONAL LAND USE MAP

According to the 2014 Land cover Map the Calcutta site is expected to be covered by mature plantations or woodlots to the east of the small stream (Orange areas in Figure 4), while the areas west of the stream is likely to still be covered in shrubland fynbos (Green in Figure 4).

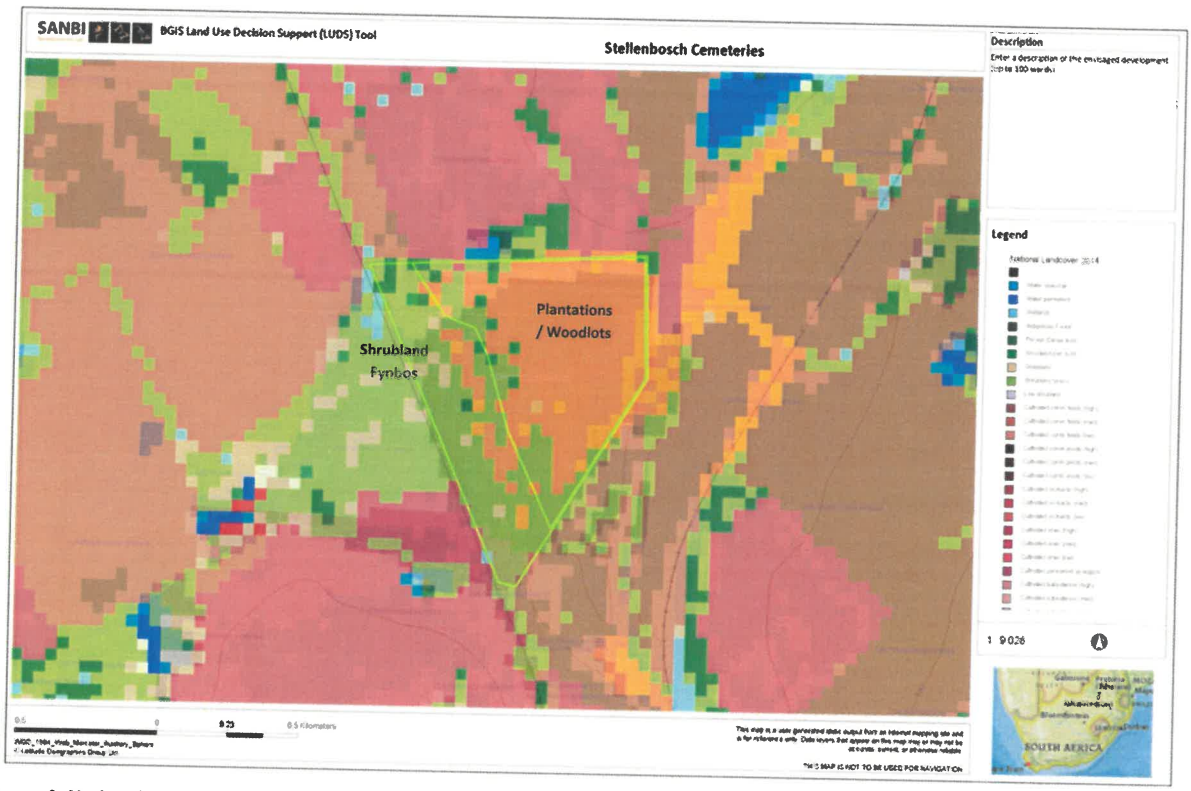

Figure 4: National Land Use map, indicating the status of the proposed site

The site visit confirms that the area to the east of the small stream is covered by dense alien invasive species (consistent with the National Land cover map), but the area to the east of the stream is has been degraded to an open grassland with no more shrubland or fynbos elements remaining (Refer to Picture 1 & 2).

Photo 1: Dense plantations to the east of the site

Photo 2: Open grassland next to the R304

5. VEGETATION ENCOUNTERED

The site visit confirmed that the Calcutta property is overgrown by a dense mix of alien invasive plant (AIP) species, dominated by *Eucalyptus* species and Port Jackson (*Acacia saligna*). No natural vegetation was encountered, apart from a few hardy remaining shrubs and sedges, which was mostly associated with the small seasonal stream. Apart from the dense stand of invasive species the site also showed a multitude of other disturbances, including sand mining activities, dumping and harvesting of fire wood (*Eucalyptus*) as well as individuals cutting fence poles.

Photo 3: The open area next to the R304 (regular brush cutting)

Photo 4: Typical vegetation just west of the small stream

Photo 5: The small seasonal stream, looking north

Photo 6: The seasonal stream, looking south

Photo 7: Typical vegetation encountered throughout the site

Photo 8: One of the open patches encountered

A few indigenous plant species was observed, scattered in between the stands of alien plant species, mostly associated with the small seasonal to the south and east of the property, but a few plants were also observed in some of the open areas. The overall area covered by indigenous species was found to be less than 5% of the total property (potentially less than 1%). These indigenous species included a stand of the sedge *Tetraria thermalis* next to the small stream, a few individuals of *Searsia angustifolia* and *Searsia laevigata* (also near the stream) a few individuals of hardy species like slangbos (*Stoebe plumose*), *Asparagus* species, renosterbos (*Dicerothamnus rhinocerotis*), *Erepsia anceps* (one patch of approximately 5 individuals) and a few restioid and grass species.

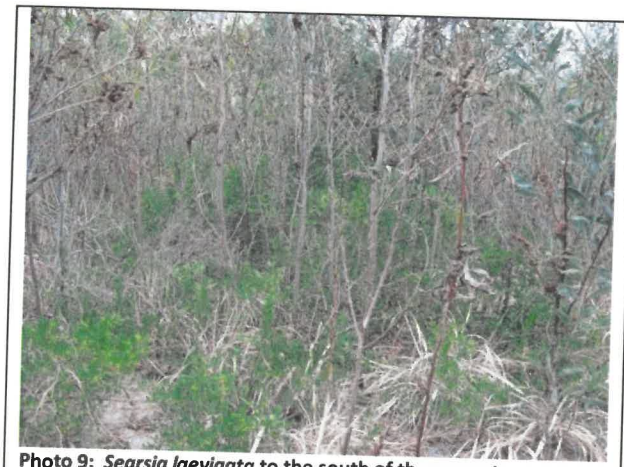

Photo 9: *Searsia laevigata* to the south of the property

Photo 10: *Erepsia anceps* observed

Photo 11: A few individuals of the pioneer renosterbos species

Photo 12: A patch of sedges near the stream

Photo 13: Typical vegetation encountered throughout the site

Photo 14: One of the open patches encountered

Photo 13 and 14 showed some of the dumping sites, while Photo 15 & 16 shows some of the areas where fire wood cutting are taking place.

Photo 15: Trees being felled for their wood

Photo 16: Older trees, felled for their wood

The site is clearly degraded to the point of being transformed. Very few indigenous plant species remains on site and they were all hardy shrubs or pioneer species. It is considered unlikely that the natural veld will ever be able to re-establish itself on the site.

The small seasonal stream is similarly degraded, with almost no riparian vegetation remaining (Photo 5 & 6). Ideally one should try to rehabilitate this stream and re-establish natural riparian vegetation. However, this will not happen under the current land use, but it is possible to make the stream a feature of the memorial park and to rehabilitate it to a more natural state.

6. RECOMMENDATIONS

Having evaluated the proposed site and its immediate surroundings, it is unlikely that the proposed development will lead to any significant impact on the biodiversity as a result of its placement. The site and its immediate surroundings are considered transformed with no natural veld remaining. Only a few hardy indigenous species remains.

However the following recommendations on impact minimization can ensure a potential positive environmental impact:

- A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase.
- All alien plants and all waste must be removed from the site and its immediate surroundings.
- The small seasonal stream must be demarcated with a suitable buffer zone (approximately 5m on each side of the small stream, measured from the center of the stream should be enough in this case).
- The buffer zone (ecological support area) should be replanted with suitable indigenous vegetation (riparian vegetation).
- The seasonal stream and its buffer zone should be incorporated as a feature within the lay-out of the memorial park.
- Only indigenous plants should be used for any landscaping within the memorial park.
- All areas impacted as a result of construction must be rehabilitated on completion of the project.

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