Plant Species Compliance Statement

prepared in accordance with the
"Protocol for the Specialist Assessment and minimum report content requirements for environmental impacts on Terrestrial Plant Species"

Erf 3991, Hartenbos near Mossel Bay in the Western Cape Province

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Terrestrial Plant Species Compliance Statement Report for Erf 3991, Hartenbos near Mossel Bay in the Western Cape Province

29 September 2022

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SPECIALIST DETAILS & DECLARATION

This report has been prepared in accordance with the "Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity", as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), published in GN. No. 320 dated 20 March 2020. It has been prepared independently of influence or prejudice by any parties.

The details of Specialists are as follows –

Table 1: Details of Specialist

Specialist	Qualification and accreditation
Dr David Hoare (Pr.Sci.Nat.)	• PhD Botany • SACNASP Reg. no. 400221/05 (Ecology, Botany)

Declaration of independence:

David Hoare Consulting (Pty) Ltd in an independent consultant and hereby declare that it does not have any financial or other vested interest in the undertaking of the proposed activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act 107 of 1998). In addition, remuneration for services provided by David Hoare Consulting (Pty) Ltd is not subjected to or based on approval of the proposed project by the relevant authorities responsible for authorising this proposed project.

Disclosure:

David Hoare Consulting (Pty) Ltd undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and will provide the competent authority with access to all information at its disposal regarding the application, whether such information is favourable to the applicant or not.

Based on information provided to David Hoare Consulting (Pty) Ltd by the client and in addition to information obtained during the course of this study, David Hoare Consulting (Pty) Ltd present the results and conclusion within the associated document to the best of the author's professional judgement and in accordance with best practise.

Dr David Hoare

29 September 2022
Date

TERMS OF REFERENCE

PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON TERRESTRIAL PLANT SPECIES

The specialist study is required to follow the published Protocols, provided in full below for the assessment of impacts on Terrestrial Plant Species. Note that the Protocols require determination of the level of sensitivity, which then determines the level of assessment required, either a full assessment, or a Compliance Statement.

Protocol For The Specialist Assessment And Minimum Report Content Requirements For Environmental Impacts On Terrestrial Plant Species

This site sensitivity assessment follows the requirements of The Environmental Impact Assessment Regulations, as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), published in GN. No. 320 dated 20 March 2020.

General information

1.1 An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified by the screening tool as being of "**very high**" or "**high**" sensitivity for terrestrial plant species, must submit a Terrestrial Plant Species Specialist Assessment Report.

1.2 An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified by the screening tool as being of "**medium** sensitivity" for terrestrial plant species, must submit either a Terrestrial Plant Species Specialist Assessment Report or a Terrestrial Plant Species Compliance Statement, depending on the outcome of a site inspection undertaken in accordance with paragraph 4.

1.3 An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified by the screening tool as being of "**low**" sensitivity for terrestrial plant species, must submit a Terrestrial Plant Species Compliance Statement.

1.4 Where the information gathered from the site sensitivity verification differs from the screening tool designation of "very high" or "high" for terrestrial plant species sensitivity on the screening tool, and it is found to be of a "low" sensitivity, then a Terrestrial Plant Species Compliance Statement must be submitted.

1.5 Where the information gathered from the site sensitivity verification differs from the screening tool designation of "low" terrestrial plant species sensitivity and it is found to be of a "very high" or "high" terrestrial plant species sensitivity, a Terrestrial Plant Species Specialist Assessment must be conducted.

1.6 If any part of the development falls within an area of confirmed "very high" or "high" sensitivity, the assessment and reporting requirements prescribed for the "very high" or "high" sensitivity, apply to the entire development footprint. Development footprint in the context of this protocol, means the area on which the proposed development will take place and includes the area that will be disturbed or impacted.

1.7 The Terrestrial Plant Species Specialist Assessment and the Terrestrial Plant Species Compliance Statement must be undertaken within the study area.

1.8 Where the nature of the activity is not expected to have an impact on species of conservation concern (SCC) beyond the boundary of the preferred site, the study area means the proposed development footprint within the preferred site.

1.9 Where the nature of the activity is expected to have an impact on SCC beyond boundary of the preferred site, the project areas of influence (PAOI) must be determined by the specialist in accordance with Species Environmental Assessment Guideline, and the study area must include the PAOI, as determined.

Terrestrial Plant Species Specialist Assessment

2.1 The assessment must be undertaken by a specialist registered with the South African Council for Natural Scientific Professions (SACNASP), within a field of practice relevant to the taxonomic groups ("taxa") for which the assessment is being undertaken.

2.2 The assessment must be undertaken within the study area.

2.3 The assessment must be undertaken in accordance with the Species Environmental Assessment Guideline and must:

2.3.1 Identify the SCC which were found, observed or are likely to occur within the study area;

2.3.2 provide evidence (photographs) of each SCC found or observed within the study area, which must be disseminated by the specialist to a recognized online database facility immediately after the site inspection has been performed (prior to preparing the report contemplated in paragraph 3);

2.3.3 identify the distribution, location, viability and detailed description of population size of the SCC identified within the study area;

2.3.4 identify the nature and the extent of the potential impact of the proposed development to the population of the SCC located within the study area;

2.3.5 determine the importance of the conservation of the population of the SCC identified within the study area, based on information available in national and international databases including the IUCN Red List of Threatened Species, Red List of South African Plants, and/or other relevant databases;

2.3.6 determine the potential impact of the proposed development on the habitat of the SCC located within the study area;

2.3.7 include a review of relevant literature on the population size of the SCC, the conservation interventions as well as any national or provincial species management plans for the SCC. This review must provide information on the need to conserve the SCC and indicate whether the development is compliant with the applicable species management plans and if not, a motivation for the deviation;

2.3.8 identify any dynamic ecological processes occurring within the broader landscape, that might be disrupted by the development and result in negative impact on the identified SCC, for example, fires in fire-prone systems;

2.3.9 identify any potential impact on ecological connectivity within the broader landscape, and resulting impacts on the identified SCC and its long term viability;

2.3.10 determine buffer distances as per the Species Environmental Assessment Guidelines used for the population of each SCC; and

2.3.11 discuss the presence or likelihood of additional SCC including threatened species not identified by the screening tool, Data Deficient or Near Threatened Species, as well as any undescribed species; and

2.3.12 identify any alternative development footprints within the preferred development site which would be of "low" sensitivity" or "medium" sensitivity as identified by the screening tool and verified through the site sensitivity verification.

2.4 The findings of the assessment must be written up in a Terrestrial Plant Species Specialist Assessment Report.

Terrestrial Plant Species Specialist Assessment Report

3.1 This report must include as a minimum the following information:

3.1.1 contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the assessment including a curriculum vitae;

3.1.2 a signed statement of independence by the specialist;

3.1.3 a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;

3.1.4 a description of the methodology used to undertake the site sensitivity verification and impact assessment and site inspection, including equipment and modelling used where relevant;

3.1.5 a description of the assumptions made and any uncertainties or gaps in knowledge or data;

3.1.6 a description of the mean density of observations/number of samples sites per unit area of site inspection observations;

3.1.7 details of all SCC found or suspected to occur on site, ensuring sensitive species are appropriately reported;

3.1.8 the online database name, hyperlink and record accession numbers for disseminated evidence of SCC found within the study area;

3.1.9 the location of areas not suitable for development and to be avoided during construction where relevant;

3.1.10 a discussion on the cumulative impacts;

3.1.11 impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);

3.1.12 a reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not, of the development related to the specific theme considered, and if the development should receive approval or not, related to the specific theme being considered, and any conditions to which the opinion is subjected if relevant; and

3.1.13 a motivation must be provided if there were any development footprints identified as per paragraph 2.3.12 above that were identified as having "low" or "medium" terrestrial plant species sensitivity and were not considered appropriate.

3.2 A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.

Terrestrial plant species compliance statement

Where the sensitivity in the Screening Report from the web-based Online Screening Tool has been confirmed to be LOW, a Plant Species Compliance Statement is required, either (1) for areas where no natural habitat remains, or (2) in natural areas where there is no suspected occurrence of SCC.

The compliance statement must be prepared by a SACNASP registered specialist under one of the two fields of practice (Botanical Science or Ecological Science).

The compliance statement must:
1. be applicable within the study area
2. confirm that the study area is of "low" sensitivity for terrestrial plant species; and
3. indicate whether or not the proposed development will have any impact on SCC.

The compliance statement must contain, as a minimum, the following information:
1. contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;
2. a signed statement of independence by the specialist;
3. a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;
4. a baseline profile description of biodiversity and ecosystems of the site;
5. the methodology used to verify the sensitivities of the terrestrial biodiversity and plant species features on the site including the equipment and modelling used where relevant;
6. in the case of a linear activity, confirmation from the terrestrial biodiversity specialist that, in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase;
7. where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr;
8. a description of the assumptions made as well as any uncertainties or gaps in knowledge or data; and
9. any conditions to which this statement is subjected.

A signed copy of the compliance statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.

INTRODUCTION

Site location

The site is Erf 991 Hartenbos near Mossel Bay to the east of the N2 national road near to the Hartenbos Interchange. Refer to Figure 1 below for the general location.

The site is accessed from Beach East Boulevard that branches from the R102 road (Louis Fourie Road) that connects Mossel Bay to Groot Brakrivier along the coast (Figure 2). The railway line is the western boundary of the site and property boundaries the remaining boundaries (Figure 2). The site is currently vacant land, whereas all surrounding areas are developed.

The scope of this report is the entire property, although parts are planned to be omitted from the development. The entire site is 89045.1 m^2.

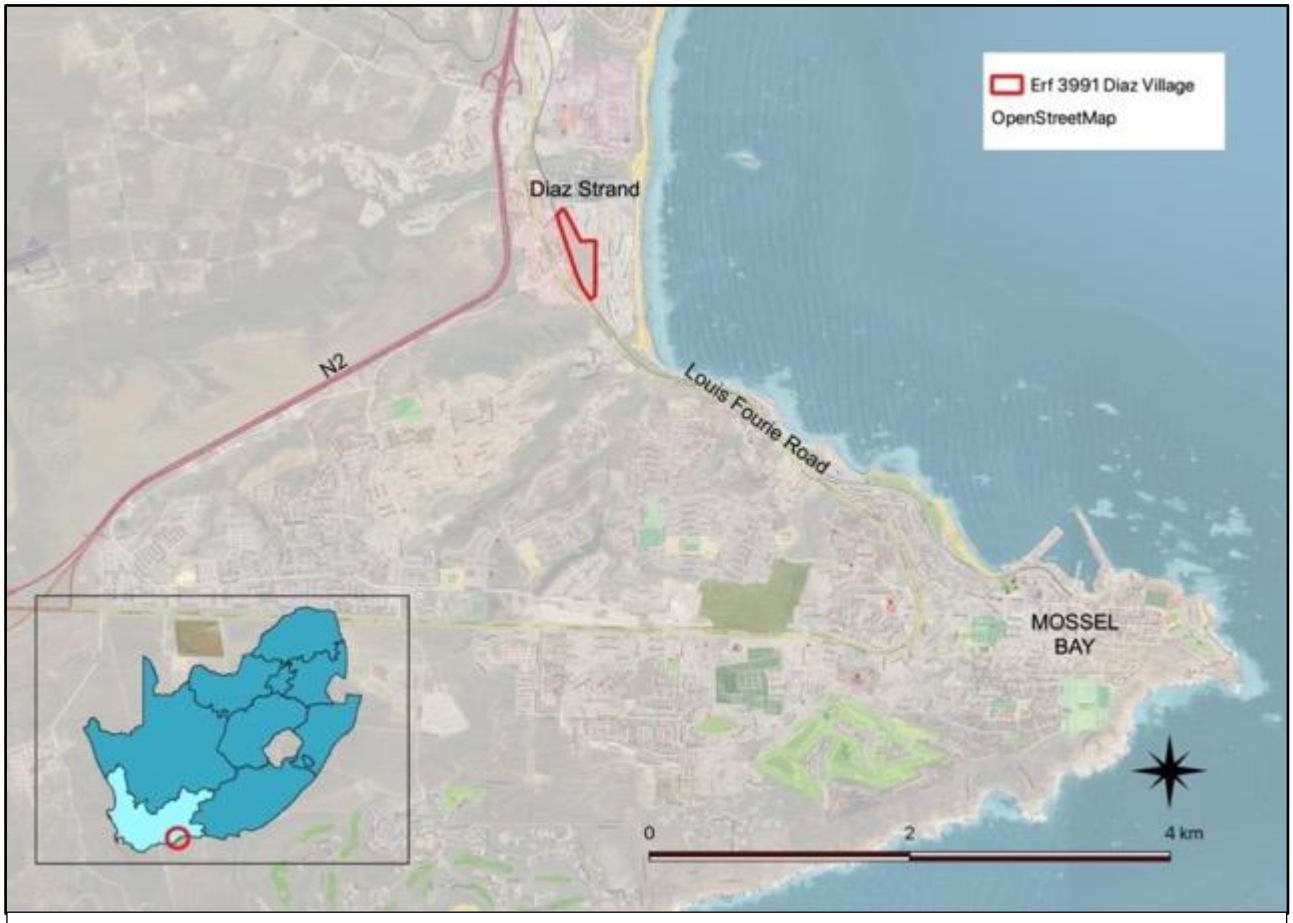

Figure 1: Location of the site.

Figure 2: Aerial image of the site and surrounding areas.

Identified Theme Sensitivities

A sensitivity screening report from the DEA Online Screening Tool was requested in the application category: Transformation of land | Indigenous vegetation. The DEA Screening Tool report for the area, dated 02/11/2021, indicates the following sensitivities (see Figure 3):

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Plant Species Theme			X	

Plant Species theme

Sensitivity features are indicates as follows:

Sensitivity	Feature(s)
Low	Low sensitivity
Medium	Lampranthus ceriseus
Medium	Lampranthus diutinus
Medium	Lampranthus fergusoniae
Medium	Lampranthus foliosus
Medium	Lampranthus pauciflorus
Medium	Ruschia leptocalyx
Medium	Argyrolobium harmsianum
Medium	Lebeckia gracilis
Medium	Leucadendron galpinii
Medium	Leucospermum praecox
Medium	Wahlenbergia polyantha
Medium	Selago glandulosa

Medium	Selago villicaulis
Medium	Erica unicolor subsp. mutica
Medium	Hermannia lavandulifolia
Medium	Sensitive species 153
Medium	Sensitive species 268
Medium	Thamnochortus muirii
Medium	Duvalia immaculata
Medium	Agathosma eriantha
Medium	Agathosma muirii
Medium	Agathosma riversdalensis
Medium	Euchaetis albertiniana
Medium	Muraltia knysnaensis
Medium	Polygala pubiflora
Medium	Nanobubon hypogaeum
Medium	Sensitive species 516
Medium	Drosanthemum lavisii
Medium	Sensitive species 800
Medium	Sensitive species 500
Medium	Sensitive species 654
Medium	Agathosma microcarpa

Figure 3: Map of relative plant species theme sensitivity.

ASSESSMENT METHODOLOGY

The detailed methodology followed as well as the sources of data and information used as part of this assessment is described below.

Project Area of Influence (PAOI)

The proposal is to develop the site for residential purposes. This will include stands for free-standing houses, dupexes, and aprtments (Figure 4). Anticipated impacts will mostly occur during the construction phase. These impacts are not expected to extend beyond the boundaries of the study area. The PAOI is therefore treated here as the development footprint within which direct impacts will occur (Figure 4).

Figure 4: Proposed development.

Survey timing

The study commenced as a desktop-study followed by site-specific field study on 21 November 2021. The site is within the Fynbos Biome with an all-year rainfall season with a slight dip in early winter (Figure 5). A more accurate indication of rainfall seasonality, which drives most ecological processes, is shown in Figure 6, which shows that Mossel Bay has peak rainfall from August to November, with another smaller peak in March to April. The timing of the survey in November is therefore ideal in terms of assessing the flora and vegetation of the site. The overall condition of the vegetation was possible to be determined with a high degree of confidence.

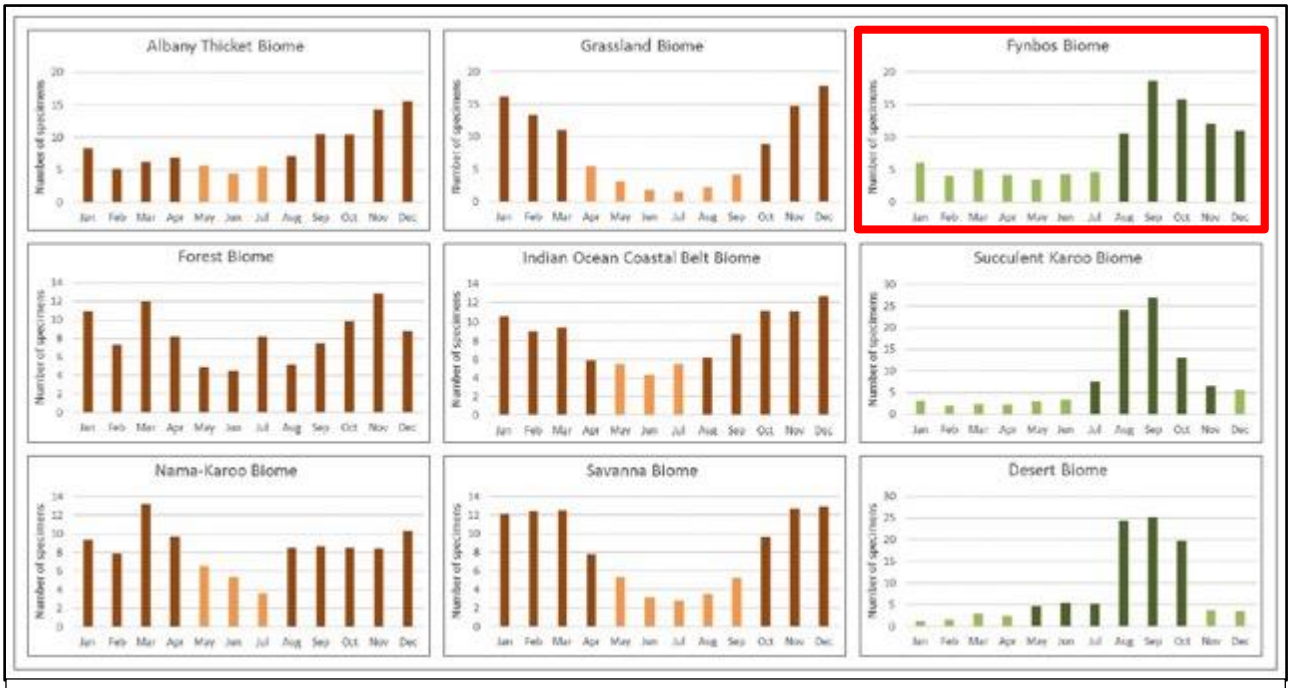

Figure 5: Recommended survey periods for different biomes (Species Environmental Assessment Guidelines). The site is within the Fynbos Biome.

Figure 6: Climate diagrams showing monthly rainfall for Mossel Bay (left), Knysna (centre) and Plettenberg Bay (right).

Field survey approach

The study commenced as a desktop-study followed by a site-specific field study. During the field survey of habitats on site, the entire site was assessed on foot. Field surveys included both meander searches of general areas, and active searching in habitats that were considered to be suitable for specific groups or species. Meander surveys were undertaken with no time restrictions - the objective was to comprehensively examine all natural areas. A hand-held Garmin GPSMap 64s was used to record a track within which observations were made (Figure 7). Digital photographs were taken of features and habitats on site, as well as of all plant species that were seen. All plant and animal species recorded were uploaded to the iNaturalist website (https://www.inaturalist.org) and are accessible by viewing the observations for the site (use the Explore menu, zoom and pan until the desired study area is within the browser window, click the button "Redo search in map", and all observations for that area will be shown and listed).

Aerial imagery from Google Earth was used to identify and assess habitats on site. This included historical imagery that may show information not visible in any single dated image. Patterns identified from satellite imagery were verified on the ground. Digital photographs were taken at locations where features of interest were observed. During the field survey, particular attention was paid to ensuring that all habitat variability was covered physically on the ground.

Figure 7: GPS track log of areas walked in the course of undertaking this assessment.

Sources of information

Vegetation and plant species

- Plant species that could potentially occur on in the general area was extracted from the NewPosa database of the South African National biodiversity Institute (SANBI) for the quarter degree grid/s in which the site is located.
- The IUCN Red List Category for plant species, as well as supplementary information on habitats and distribution, was obtained from the SANBI Threatened Species Programme (Red List of South African Plants, http://redlist.sanbi.org).
- Lists were compiled specifically for any species at risk of extinction (Red List species) previously recorded in the area. Historical occurrences of threatened plant species were obtained from the South African National Biodiversity Institute (http://posa.sanbi.org) for the quarter degree square/s within which the study area is situated. Habitat information for each species was obtained from various published sources. The probability of finding any of these species was then assessed by comparing the habitat requirements with those habitats that were found, during the field survey of the site, to occur there.
- Regulations published for the National Forests Act (Act 84 of 1998) (NFA) as amended, provide a list of protected tree species for South Africa. The species on this list were assessed in order to determine which protected tree species have a geographical distribution that coincides with the study area and habitat requirements that may be met by available habitat in the study area. The distribution of species on this list were obtained from published sources (e.g. van Wyk & van Wyk 1997) and from the SANBI Biodiversity Information System website (http://sibis.sanbi.org/) for quarter degree grids in which species have been previously recorded. Species that have been recorded anywhere in proximity to the site (within 100 km), or where it is considered possible that they could occur there, were listed and were considered as being at risk of occurring there.

Limitations

The following assumptions, limitations, uncertainties are listed regarding the assessment of the site:

- The assessment is based on a single site visit. The current study is based on an extensive site visit as well as a desktop study of the available information. The time spent on site was adequate for understanding general patterns across affected areas.
- Compiling the list of species that could potentially occur on site is limited by the paucity of collection records for the area. The list of plant species that could potentially occur on site was therefore taken from a wider area and from literature sources that may include species that do not occur on site and may miss species that do occur on site. In order to compile a comprehensive site-specific list of the biota on site, studies would be required that would include different seasons, be undertaken over a number of years and include extensive sampling. Due to legislated time constraints for environmental authorisation processes, this is not possible.
- Rare and threatened plant species are, by their nature, usually very difficult to locate and can be easily missed.

OUTCOME OF THE ASSESSMENT

Historical disturbance on site

A 1957 aerial photograph shows the entire site to be in a natural state at that date. By 1974 this had changed and clearing occurred in the southern two-thirds of the site. A 1989 aerial photograph of the site (Figure 8) shows that the southern two-thirds of the site were cleared, but that the northern section was still natural. By 1991, an additional strip was cleared into the northern section, leaving the pattern that is currently in place. The patterns of clearing on site appear to be related to the general development of the surrounding areas.

Figure 8: Historical aerial photo of the site, dated 6 June 1989.

Natural habitats on site

Based on a detailed field survey to verify conditions on site, it was determined that, with the exception of some bands of dune thicket, only secondary habitat remains on site (Figure 9). A series of photographs are provided below that give various views on site (Figures 10 - 13). The habitat assessment is important for understanding the suitability of habitat on site for various plant species of concern, which usually have very specific habitat requirements.

Figure 9: Map of habitats on site.

Dune Thicket

There is a strip of dune thicket running down the western boundary of the site, parallel to the railway line. It is dominated entirely by milkwoods, *Sideroxylon inerme* (protected tree species), which form a continuous narrow canopy. These trees were mostly of a significant size that suggests that they have been there for many decades at least and indicates that this is a naturally occurring area of vegetation.

There is also a wider band of the trees in the northern part of the site, along the eastern boundary. This is more structurally diverse, with areas of closed canopy and other more open areas. This area has a wider diversity of woody tree and shrub species, including *Aloe arborescens*, *A. maculata, Asparagus aethiopicus, Azima tetracantha, Brachylaena discolor, Brunsvigia orientalis, Capparis sepiaria, Carissa bispinosa, Cussonia thyrsiflora, Euclea racemosa, Euphorbia mauritanica, Grewia occidentalis, Gymnosporia buxifolia, Lauridia tetragona, Olea europaea* subsp. *cuspidata,*

Putterlickia pyracantha, Rhoicissus digitata, Schotia afra, Searsia glauca, Searsia pterota, and *Tarchonanthus littoralis*.

This habitat is marginally suitable for *Euchaetis albertiniana, Hermannia lavandulifolia, Lampranthus pauciflorus, Leucadendron galpinii, Leucospermum praecox, Muraltia knysnaensis, Selago glandulosa*, and a sensitive orchid speices. Potentially suitable habitat is very limited in extent and was very carefully searched for all of these species. None were found there.

Disturbed areas and secondary vegetation

Most of the vegetation on site is in previously cleared areas, where there has also been significant dumping of rubble in large mounds. Thee vegetation is therefore either secondary, or dominated by weeds. Plant species occurring in these areas include *Carpobrotus deliciosus, Carpobrotus edulis, Cynodon dactylon, Ehrharta calycina, Eragrostis curvula, Felicia muricata, Leonotis ocymifolia, Malva arborea, Mesembryanthemum aitonis, Oncosiphon pilulifer, Osteospermum moniliferum, Pelargonium peltatum* and *Plantago lanceolata*, as well as the exotic species, *Lolium perenne**, *Ricinus communis** (NEMBA Category 1b), *Schinus terebinthifolia** (NEMBA Category 3 in WC) and *Solanum linnaeanum**.

This is a transformed habitat type and no plant species of concern are likely to occur here.

Figure 10: Band of thicket along western boundary.

Figure 11: Mixed thicket in northern part of site.

Figure 13: General view of secondary vegetation on site.

Figure 12: Areas on site dominated by alien invasive *Acacia cyclops*.

Red List plant species of the study area

According to the National Web-Based Environmental Screening Tool (DFFE), a number of plant species of concern are flagged for the site (see previous section of this report). These are mostly fynbos species, or are species found in intact natural habitat. None of them were found on site and, based on the habitat assessment, it is not considered likely that any of them would occur.

Agathosma eriantha
Vulnerable B1ab(ii,iii,iv,v)
Found from Bredasdorp to Stilbaai on sea level flats in dry, clay soil interspersed with limestone chips. The study area falls just outside the known distribution range and no suitable habitat occurs on site. It is therefore unlikely to occur there.

Agathosma microcarpa
Vulnerable B1ab(i,ii,iii,iv,v)
Found from Potberg to Mossel Bay on rocky outcrops on dolomitic soils in renosterveld. No suitable habitat occurs on site. It is therefore unlikely to occur there.

Agathosma muirii
Vulnerable A4abc
Found from Stilbaai to Mossel Bay on deep sands on coastal dunes associated with limestone. No suitable habitat occurs on site. It is therefore unlikely to occur there.

Agathosma riversdalensis
Vulnerable B1ab(ii,iii,iv,v)
Found from Arniston to Albertinia on the arid transitions between limestone and sand plain fynbos. The site is just outside the known distribution and no suitable habitat occurs on site. It is therefore unlikely to occur there.

Argyrolobium harmsianum
Endangered B1ab(ii,iii)
Found from Agulhas to Mossel Bay on coastal limestone. No suitable habitat occurs on site. It is therefore unlikely to occur there.

Drosanthemum lavisii
Endangered B1ab(ii,iii,iv,v); C2a(i)
Found from Montagu and Bredasdorp to Albertinia on the ecotone between fynbos and renosterveld, at elevations of 150-200 m. The site is just outside the known distribution and no suitable habitat occurs on site. It is therefore unlikely to occur there.

Duvalia immaculata
Endangered B1ab(ii,iii,iv,v)
Found from Cape Infanta to Klein Brak River near Mossel Bay in the arid fynbos-renosterveld ecotone vegetation, on shale and limestone. No suitable habitat occurs on site. It is therefore unlikely to occur there.

Erica unicolor subsp. mutica
Vulnerable A4abc
Found from Mossel Bay to Herbertsdale and George on lowlands and lower south and north-facing slopes in fynbos. No suitable habitat occurs on site. It is therefore unlikely to occur there.

Euchaetis albertiniana
Endangered A2c

Found from De Hoop to George along the coast, inland to Albertinia on deep red sands over limestone in Canca Limestone Fynbos, Garden Route Granite Fynbos, Albertinia Sand Fynbos and Hartenbos Strandveld. It has been recorded multiple times around Mossel Bay, as well as at Klein Brakrivier and Tergniet. It could possibly occur on site, within open areas in the thicket. Suitable habitat occurs on site within the northern thicket band on site, but no plants were seen there. The potentially suitable habitat on site is very limited in extent and is mostly closed thicket. This area was carefully searched for SCC. It is therefore possible for it to occur there, but assumed to be absent on the basis of not being seen.

Hermannia lavandulifolia

Vulnerable A2c
Found from Worcester to the Overberg, and extends along the southern Cape coastal lowlands as far east as Plettenberg Bay. It is found on on clay slopes in renosterveld and valley thicket. Suitable habitat occurs on site within the northern thicket band on site, but no plants were seen there. The potentially suitable habitat on site is very limited in extent and was carefully searched. It is therefore possible for it to occur there, but assumed to be absent on the basis of not being seen.

Lampranthus ceriseus

Vulnerable B1ab(ii,iii,iv,v)
Found from Agulhas Plain to Riversdale in coastal limestone fynbos. No suitable habitat occurs on site. It is therefore unlikely to occur there.

Lampranthus diutinus

Endangered B1ab(ii,iii,iv,v)
Found from Mossel Bay to Riversdale on coastal sands in Albertinia Sand Fynbos and Hartenbos Strandveld. No suitable habitat occurs on site. It is therefore unlikely to occur there.

Lampranthus fergusoniae

Vulnerable B1ab(ii,iii,iv,v)
Found from Pearly Beach to Knysna on calcareous soils often associated with limestone dunes. No suitable habitat occurs on site. It is therefore unlikely to occur there.

Lampranthus foliosus

Endangered B1ab(ii,iii,iv,v)
Found from Mossel Bay to Gansbaai on limestone pavements. No suitable habitat occurs on site. It is therefore unlikely to occur there.

Lampranthus pauciflorus

Vulnerable A4abc
Found from Cape Infanta to Plettenberg Bay. Four known locations remain after most of this species' habitat has been transformed for coastal development. Habitat loss continues, especially around Plettenberg Bay, Mossel Bay and Knysna. It is found on rocky coastal slopes and clay hills. Major habitats are Groot Brak Dune Strandveld, Blombos Strandveld, Overberg Dune Strandveld, Potberg Sandstone Fynbos, Garden Route Granite Fynbos, Albertinia Sand Fynbos, Knysna Sand Fynbos, Hartenbos Strandveld, and Goukamma Dune Thicket. Suitable habitat occurs on site within the northern thicket band on site, but no plants were seen there. The potentially suitable habitat on site is very limited in extent and was carefully searched. It is therefore possible for it to occur there, but assumed to be absent on the basis of not being seen.

Lebeckia gracilis

Endangered A2bc; B1ab(ii,iii,iv,v)
Found from Gqeberha to Bredasdorp in coastal fynbos in deep, sandy soil below 300 m. No suitable habitat occurs on site. It is therefore unlikely to occur there.

Leucadendron galpinii

Vulnerable A4c

Found from De Hoop to Mossel Bay in low-lying areas between limestone hills on deeper, neutral soils. Suitable habitat occurs on site within the northern thicket band on site, but no plants were seen there. The potentially suitable habitat on site is very limited in extent and was carefully searched. It is a relatively large and conspicuous plant that would have been seen if it occurred there. It is therefore assumed to be absent on the basis of not being seen.

Leucospermum praecox

Vulnerable A2c+3c+4c

Found from Gourits River Mouth to Mossel Bay on tertiary acid sands associated with limestone formations on the coastal forelands. Suitable habitat occurs on site within the northern thicket band on site, but no plants were seen there. The potentially suitable habitat on site is very limited in extent and was carefully searched. It is a relatively large and conspicuous plant that would have been seen if it occurred there. It is therefore assumed to be absent on the basis of not being seen.

Muraltia knysnaensis

Endangered B1ab(ii,iii,iv,v)

Found from Mossel Bay and the Keurbooms River on coastal lowlands. Suitable habitat occurs on site within the northern thicket band on site, but no plants were seen there. The potentially suitable habitat on site is very limited in extent and was carefully searched. It is therefore possible for it to occur there, but assumed to be absent on the basis of not being seen.

Nanobubon hypogaeum

Endangered B1ab(i,ii,iii,iv,v)

Found from Mossel Bay to Knysna in sandy coastal fynbos. No suitable habitat occurs on site. It is therefore unlikely to occur there.

Polygala pubiflora

Vulnerable B1ab(ii,iii,iv)+2ab(ii,iii,iv)

Found from Cape Infanta to Mossel Bay on limestone and shale rocky outcrops. No suitable habitat occurs on site. It is therefore unlikely to occur there.

Ruschia leptocalyx

Endangered B1ab(ii,iii,iv,v)

Found from Potberg to Hartenbos on gravelly quartzitic and shale outcrops. No suitable habitat occurs on site. It is therefore unlikely to occur there.

Selago glandulosa

Vulnerable B1ab(ii,iii,iv,v)

Found from Potberg to Mossel Bay on coastal dunes and on limestone hills and outcrops. Suitable habitat occurs on site within the northern thicket band on site, but no plants were seen there. The potentially suitable habitat on site is very limited in extent and was carefully searched. It is therefore possible for it to occur there, but assumed to be absent on the basis of not being seen.

Selago villicaulis

Vulnerable B1ab(ii,iii,iv,v)

Found from Stilbaai to Knysna on fixed dunes up to 150 m. No suitable habitat occurs on site. It is therefore unlikely to occur there.

Sensitive species 500 (orchid)

Endangered C2a(i)

Found from Cape Flats to Gqeberha on lowland sandy flats, stabilised dunes and coastal rock promontories. Observations include coastal and mountain habitats. Suitable habitat occurs on site within the northern thicket band on site, but no plants were seen there. The potentially suitable habitat on site is very limited in extent and was carefully searched. It is a relatively large and conspicuous plant that would have been seen if it occurred there. It is therefore assumed to be absent on the basis of not being seen.

Sensitive species 800 (bulb)
Vulnerable B1ab(iii)
Found from Cape Peninsula to Knysna on limestone and clay loam soil, fynbos and renosterveld on coastal lowlands. No suitable habitat occurs on site. It is therefore unlikely to occur there.

Thamnochortus muirii
Vulnerable B1ab(i,ii,iii,iv,v)
Found from Potberg to Mossel Bay on deep sandy habitats associated with limestone, 30-200 m. No suitable habitat occurs on site. It is therefore unlikely to occur there.

Wahlenbergia polyantha
Vulnerable B1ab(ii,iii,iv,v)
Found from Kleinmond to Knysna on sandy flats. No suitable habitat occurs on site. It is therefore unlikely to occur there.

There are eight species for which suitable or marginally suitable habitat occurs on site, namely *Hermannia lavandulifolia* (Vulnerable), *Agathosma albertiniana* (Endangered), *Lampranthus pauciflorus* (Vulnerable), *Leucadendron galpinii* (Vulnerable), *Leucospermum praecox* (Vulnerable), *Muraltia knysnaensis* (Endangered), *Selago glandulosa* (Vulnerable) and Sensitive species 800 (Endangered). Suitable habitat is very limited in extent and restricted to the dune thicket band in the northern part of the site. These areas were carefully searched for SCC and none were found.

There are therefore no threatened, near threatened or rare species that are likely to occur in the study area. It is therefore verified that the Plant Species Theme has <u>LOW</u> sensitivity for this site.

SITE ECOLOGICAL IMPORTANCE

The Species Environmental Assessment Guidelines require that a Site Ecological Importance (SEI) is calculated for each habitat on site, and provides methodology for making this calculation. The SEI is assessed separately for each biodiversity theme and is assessed below specifically for the Terrestrial Plant Species theme.

As per the Species Environmental Assessment Guidelines, Site Ecological Importance (SEI) is calculated as a function of the Biodiversity Importance (BI) of the receptor and its resilience to impacts (SEI = BI + RR). The Biodiversity Importance (BI) in turn is a function of Conservation Importance (CI) and Functional Integrity (FI), i.e. BI = CI + FI.

An assessment of habitats on site is provided below (Table 3) specifically for the Plant Species Theme.

Table 2: Site ecological importance for habitats found on site

Habitat	Conservation importance	Functional integrity	Receptor resilience	Site Ecological Importance (BI)
Dune Thicket	Low No confirmed or highly likely populations of SCC.	Low Small (> 1 ha but < 5 ha) area. Several minor and major current negative ecological impacts.	Low Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a low likelihood of returning to a site once the disturbance or impact has been removed.	Medium (BI = Low)
Degarded & secondary vegetation	Very low No natural habitat remaining.	Very low Several major current negative ecological impacts.	Very high Habitat that can recover rapidly	Very low (BI = Very low)

Guidelines for development activities within different importance levels are given in the Table below (Table 8).

Table 3: Guidelines for interpreting SEI in the context of the proposed development activities

Site ecological importance	Interpretation in relation to proposed development activities
Very high	Avoidance mitigation – no destructive development activities should be considered. Offset mitigation not acceptable/ not possible (i.e. last remaining populations of species, last remaining good condition patches of ecosystems/ unique species assemblages). Destructive impacts for species/ecosystems where persistence target remains.
High	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted; limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Medium	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Low	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities
Very low	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

Summary of site sensitivity

The only remaining natural habitat on site is the band of milkwoods along the railway line that mark the western boundary of the site, as well as the larger band in the northern part of the site, which consists of a more mixed area of thicket. All other vegetation on site is secondary or disturbed and does not qualify as original natural vegetation.

Based on the "Site Ecological Importance" assessment, the **Dune Thicket is mapped as having MEDIUM sensitivity,** and other parts of the site as having **VERY LOW sensitivity** (Figure 18) for the Terrestrial Plant Species Theme.

Figure 14: Plant species theme sensitivity for the site.

CONCLUSION

Desktop information, field data collection and mapping from aerial imagery provides the following verifications of patterns for the plant species theme:

1. Most of the site consists of secondary and/ or degraded areas, incuding areas heavily invaded by alien invasive shrubs. There is a band of dune thicket running down the western boundary of the site and a wider band of dune thicket in the north-eastern part of the site. These thicket areas have been designated as having medium sensitivity. The remaining degraded areas are designated as having very low sensitivity.

2. The areas of dune thicket on site are dominated by a protected tree species, *Sideroxylon inerme*. The trees are protected under the National Forests Act.

3. No plant species of concern were found on site and, based on the available habitat, it is considered unlikely that any of those plant species flagged for the site occur there. The site therefore has low sensitivity in terms of the Plant Species Theme.

4. The proposed development is entirely within areas mapped as degraded / secondary that have low biodiversity value and sensitivity. The development is therefore supported.

RECOMMENDATIONS

- If any milkwood trees are to be affected by the proposed development, it is a requirement that a permit be obtained, as per the National Forests Act.

REFERENCES

Germishuizen, G., Meyer, N.L., Steenkamp, Y And Keith, M. (eds.) (2006). A checklist of South African plants. Southern African Botanical Diversity Network Report No. 41, SABONET, Pretoria.

IUCN (2001). *IUCN Red Data List categories and criteria: Version 3.1*. IUCN Species Survival Commission: Gland, Switzerland.

APPENDICES:

Appendix 1: Plant species recorded on site.

Acacia cyclops* (NEMBA Category 1b)
Agave americana* (NEMBA Category 3 in WC)
Aizoon pubescens
Aizoon secundum
Albuca canadensis
Aloe arborescens
Aloe maculata
Asparagus aethiopicus
Azima tetracantha
Brachylaena discolor
Brunsvigia orientalis
Capparis sepiaria
Carissa bispinosa
Carpobrotus deliciosus
Carpobrotus edulis
Cussonia thyrsiflora
Cynanchum obtusifolium
Cynanchum viminale
Cynodon dactylon
Delosperma litorale
Drimia capensis
Ehrharta calycina
Eragrostis curvula
Euclea racemosa
Euphorbia mauritanica
Felicia muricata
Ferraria crispa
Crassula sp.
Drosanthemum sp.
Grewia occidentalis
Gymnosporia buxifolia
Helichrysum teretifolium
Indigofera sp7
Jamesbrittenia tenuifolia
Lauridia tetragona
Leonotis ocymifolia
Lolium perenne*
Lycium ferocissimum
Malva arborea
Megathyrsus maximus
Mesembryanthemum aitonis
Olea europaea subsp cuspidata
Oncosiphon pilulifer
Osteospermum moniliferum
Pelargonium peltatum
Plantago lanceolata
Putterlickia pyracantha
Rhoicissus digitata
Ricinus communis* (NEMBA Category 1b)
Schinus terebinthifolia* (NEMBA Category 3 in WC)

Schotia afra
Searsia glauca
Searsia pterota
Sideroxylon inerme (PROTECTED National Forests Act)
Solanum linnaeanum*
Tarchonanthus littoralis
Tephrosia capensis
Tetragonia fruticosa