Terrestrial Biodiversity Assessment

Milkwood Manor

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Author: J. Pote

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Draft Report

Revisions

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First Draft	26/07/2024	Jamie Pote
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Final Version	27/11/2024	*Jamie Pote*

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1 Introduction & Background

1.1 Background

Sharples Environmental Services cc (SES) has been appointed as the independent Environmental Assessment Practitioner (EAP) to conduct the Environmental Assessments for the Proposed additions and alterations on Erf 10190, situated in Salmack Rd, Plettenberg Bay, Bitou, Western Cape (Figure 1). As part of this application, a Terrestrial Biodiversity & Plant Specialist Assessment is required. The site is a developed residential Erf, however due to proximity to both the sea and the Keurbooms Estuary, a basic assessment application process is triggered. As part of this process, a terrestrial biodiversity assessment is required to support the necessary environmental applications.

Figure 1: Site locality.

1.2 Activity Description

The site is situated within a transformed developed suburb and is situated specifically on the western edge of the Keurbooms River estuary within what would have previously been a dune thicket vegetated area on the banks of the estuary (*Figure 16* to *Figure 31*). The eastern side of the site falls within the estuary itself and is prone to being eroded as the estuary is constantly migrating in an east-west direction. The western side of the site has been stabilised with rocks to protect the buildings from erosion due to flooding and tidal movement within the estuary.

The development proposal assessed includes additions and alterations to the existing buildings as well as construction of both internal and public parking bays and public ablution facilities to service visitors to the adjacent public beach. Two alternative site development plans were initially proposed and assessed (Figure 2 & Figure 3).

Figure 2: Previous Preferred Site Development Plan.

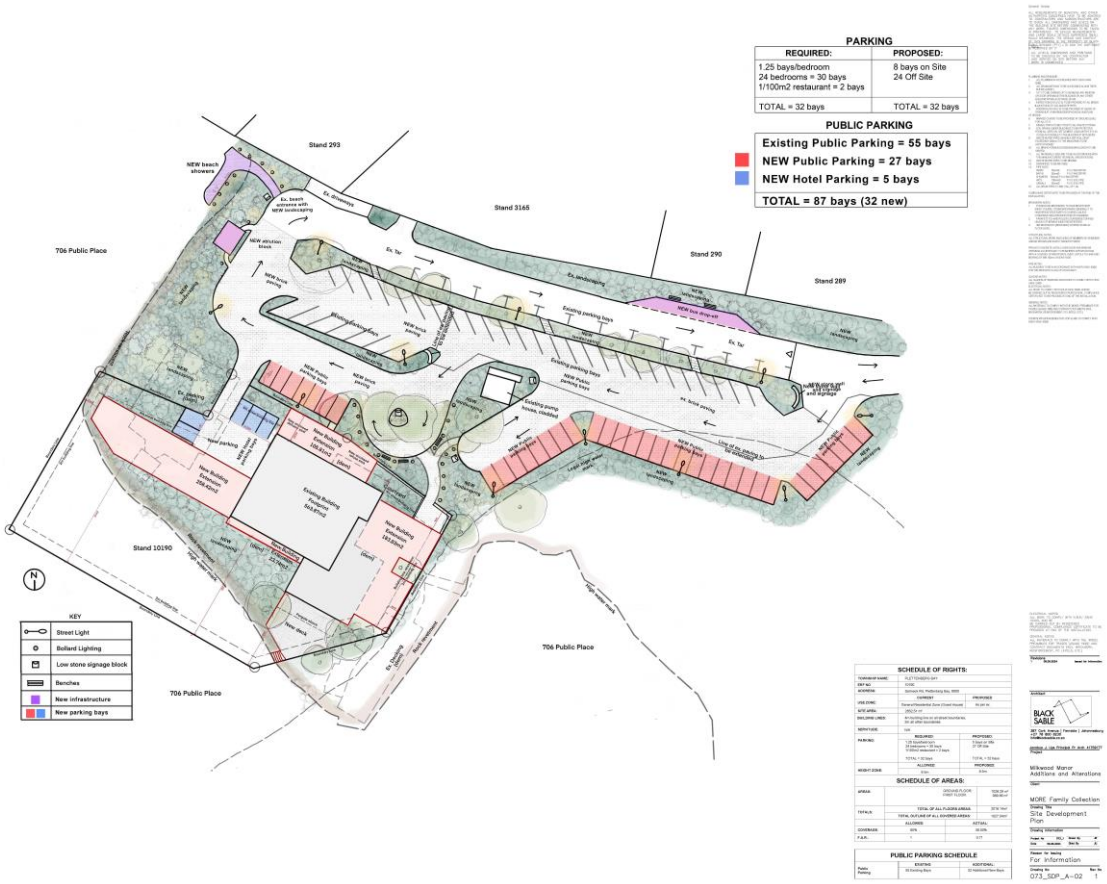

Figure 3: Previous Alternative Site Development Plan.

The preferred and alternative development plans are very similar, with the alternative plan having ablution facilities placed within the parking area rather than directly adjacent to the beach and one less room on the extension, extending slightly closer to the property boundary on the coastward side.

Subsequent to the initial public review period, comments relating to the proposed beach access and beach shower have resulted in the applicant having revised the layouts including the preferred (Figure 4) and alternative (Figure 5) layouts. Changes to the preferred layout include:

- Removal of beach shower deck
- Removal of bus drop-off area
- Removal of ablution block
- The new east building extension has increased from 213.54 m² to 278 m²
- The new northwest building extension has been set back by approx. 3m; however, a deck will extend to the property boundary.

Changes to the alternative layout include:

- The new east building extension has decreased from 282,16m² to 278 m²
- The new northwest building extension has been set back by approx. 3m; however, a deck will extend to the property boundary.
- The ablution block is now located next to the existing pump house

The revised layouts as described above will result in no significant changes to the terrestrial biodiversity impacts, neither direct nor indirect.

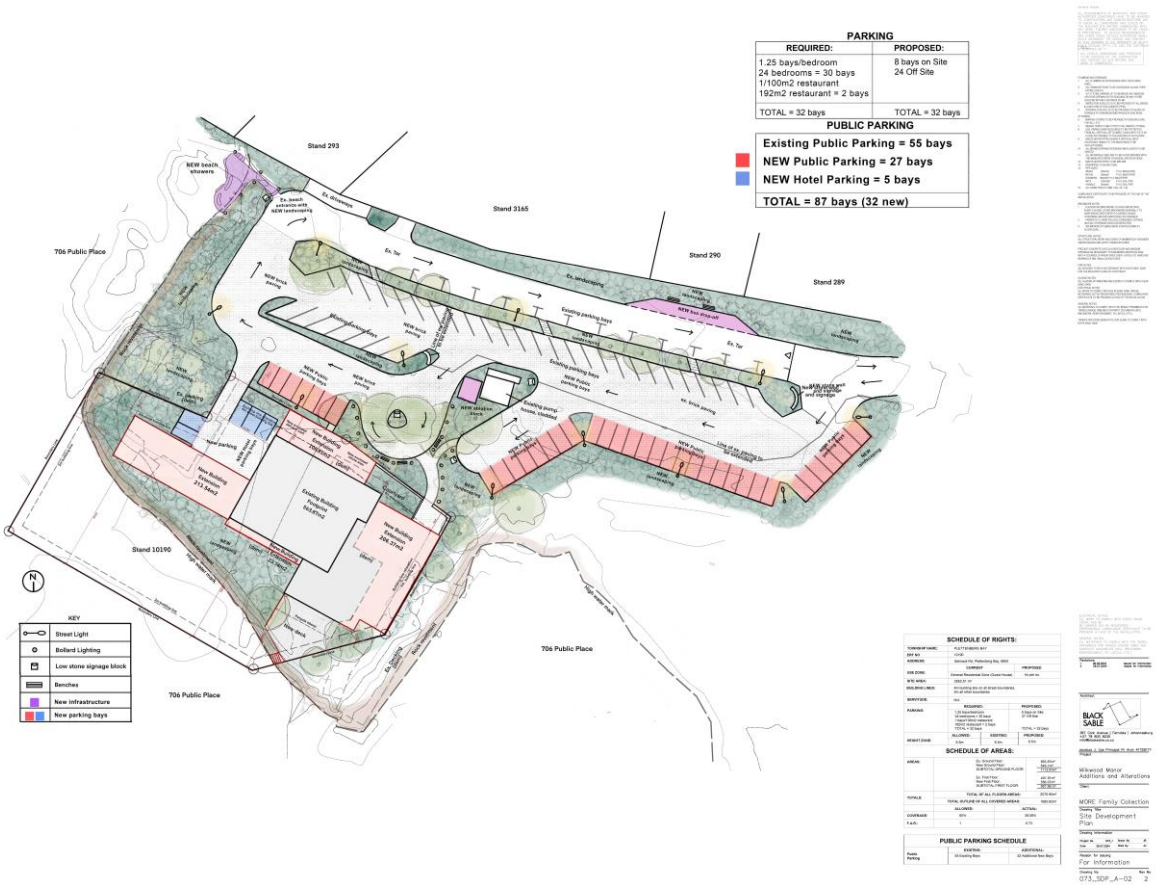

Figure 4: Revised Preferred Site Development Plan.

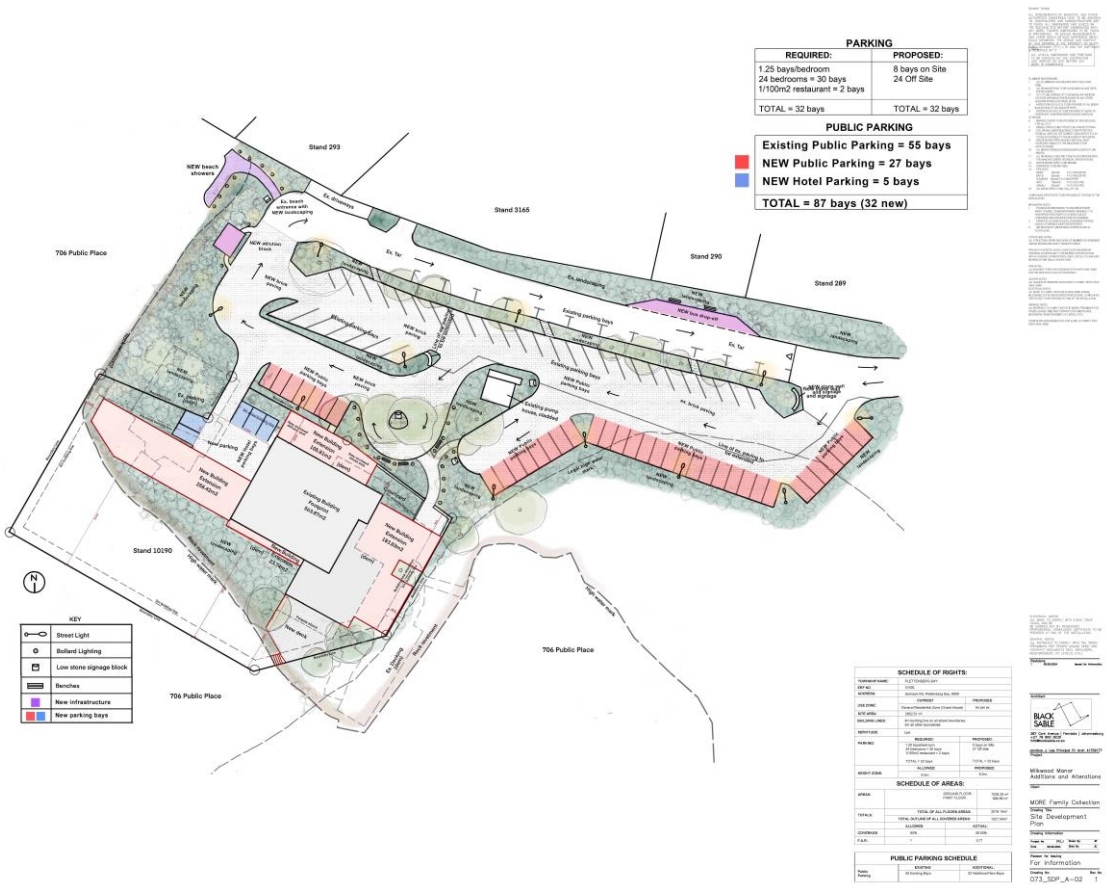

Figure 5: Revised Alternative Site Development Plan.

1.3 Purpose of Report

The "*Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of sections 24 (5) (a) and (h) and 44 of the Act, when applying for Environmental Authorisation*", as published on 20 March, 2020 in National Gazette, No. 43110 in terms of NEMA (Act 107 of 1998) sections 24(5)(a), (h) and 44, lists protocols and minimum report requirements for environmental impacts on terrestrial biodiversity and provides the criteria for the assessment and reporting of impacts on terrestrial biodiversity for activities requiring environmental authorisation. The assessment and minimum reporting requirements of this protocol are associated with a level of environmental sensitivity identified by the National web based Environmental Screening Tool. Prior to commencing with a specialist assessment, the current use of the land and the environmental sensitivity of the site under consideration, identified by the screening tool, must be confirmed by undertaking a **site sensitivity verification**, which must include the following.

1. The site sensitivity verification must be undertaken by an environmental assessment practitioner or a specialist.
2. The site sensitivity verification must be undertaken through the use of:
    a. a desk top analysis, using satellite imagery.
    b. a preliminary on -site inspection; and
    c. any other available and relevant information.
3. The outcome of the site sensitivity verification must be recorded in the form of a report that:
    a. confirms or disputes the current use of the land and environmental sensitivity as identified by the screening tool.
    b. contains a motivation and evidence of either the verified or different use of the land and environmental sensitivity; and

c. is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations.

The National Web Based Screening Tool was used to generate the potential environmental sensitivity of the site which has then been compared to various online and other databases and information sources in order to verify and confirm the validity of the screening tool findings. This was further supported with on-site observations and analysis of most recent aerial photography.
This terrestrial biodiversity site verification has been undertaken as per the requirements of the Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for environmental authorisation (GN 320, 20 March 2020).

1.4 Methodology and Approach

The proposed methodology and approach followed in this assessment are outlined below:

- Conduct a comprehensive desktop study and identify potential risks relating to vegetation and flora of the site and surrounding area, for a Terrestrial Biodiversity Assessment Report. This will include the relevant Regional Planning and legislated frameworks, which will also be represented in a series of associated maps.
- Conduct a detailed site visit to assess the following:
  - Detailed field survey of vegetation, flora and habitats present.
  - Comprehensive species list, highlighting species that are of special concern, threatened, Red Data species and species requiring permits for destruction/relocation in terms of NEMBA and the Provincial Nature Conservation Ordinance No. 19 of 1974.
  - Detailed mapping of the various habitat units and assessment of habitat integrity, ecological sensitivity, levels of degradation and transformation, alien invasion and Species of Conservation Concern, the outcome being a detailed sensitivity map ranked into high, medium or low classes.
- Reporting will be comprised of a preliminary summary, with identification of anticipated impacts and risks for any scoping phase report (where applicable), a draft detailed Assessment Report (for public review and comment) and a Final Assessment Report for submission. The draft and final detailed reports will include the following:
  - Indicate any assumptions made and gaps in available information. Assessment of all the vegetation types and habitat units within the relevant Regional Planning Frameworks.
  - A detailed species list highlighting the various Species of Conservation Concern categories (endemic, threatened, Red Data species and other protected species requiring permits for destruction/relocation and invasive/exotic weeds).
  - Description and assessment of the habitat units and site sensitivities ranked into high, medium or low classes based on sensitivity and conservation importance. A standard methodology has been developed based on other projects in the specific area.
  - Assessment of Impacts and Mitigation Measure, as well as specific measure that may be required for alternative development plans.
  - A comprehensive EMPr for inclusion in the reports and EMP with specific management actions for construction and Operation.
  - A habitat sensitivity map will be compiled, indicting the sensitivities as described above.
  - A map indicating buffers (if required) to accommodate Regional Planning and any other requirements.

1.5 Data sources and references

Data sources that were utilised for this report include the following:

- National (DFFE) Web Based Screening Tool – to generate the sites potential environmental sensitivity.

- National Vegetation Map 2018 (NVM, 2018), Mucina & Rutherford (2006) and National Biodiversity Assessment or Red Listed Ecosystems (NBA/RLE, 2022) – description of vegetation types, species (including endemic) and most recent vegetation unit conservation status.
- National and Regional Legislation including Provincial Nature Conservation Ordinance (P.N.C.O). NEM:BA Threatened or Protected Species (ToPS).
- Botanical Database of Southern Africa (BODATSA) and New Plants of Southern Africa (POSA) – lists of plant species and potential species of concern found in the general area (SANBI.)
- International Union for Conservation of Nature (IUCN) - Red List of Threatened Species.
- Animal Demography Unit Virtual Museum (VM) – potential faunal species.
- Global Biodiversity Information Facility (GBIF) – potential flora & faunal species.
- National Red Books and Lists - mammals, reptiles, frogs, dragonflies & butterflies.
- National Freshwater Ecosystem Priority Areas assessment (NFEPA, 2011) - important catchments.
- National Protected Areas Expansion Strategy (NPAES, 2018) and South Africa Protected Area database (2020) – protected area information.
- SANBI BGIS – All other biodiversity GIS datasets.
- Western Cape Biodiversity Spatial Plan (2017).
- Aerial Imagery – Google Earth, ESRI, Chief Surveyor General (http://csg.dla.gov.za).
- Cadastral and other topographical country data - Chief Surveyor General (http://csg.dla.gov.za).
- Other sources may include peer-reviewed journals, regional and local assessments, and studies in the general location of the project and its area of influence, landscape prioritization schemes (Key Biodiversity Areas), systematic conservation planning assessments and plans (as above), and any pertinent masters and doctoral theses, among others.

This terrestrial biodiversity assessment has been undertaken as per the requirements of the Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for environmental authorisation (GN 320, 20 March 2020).

1.5.1 Site visit

A site inspection was conducted on **23 July 2024**, during mid-winter. The site falls within a temperate climate with rainfall occurring throughout the year but is often higher in winter, hence for the purposes of this report, a single site visit is deemed to be adequate, specifically due to the disturbed nature of the site where the proposed development is within a developed Erf.

1.5.2 Assumptions, Uncertainties and Gaps in Knowledge

The findings and recommendations of this report may be susceptible to the following uncertainties and limitation:

- No assessment has been made of aquatic or estuarine aspects relating to any wetlands, pans, and rivers/seeps and/or estuaries or marine ecosystems outside of the scope of a terrestrial biodiversity report. Refer to separate reporting.
- Any botanical surveys based upon a limited sampling time-period, may not reflect the actual species composition of the site due to seasonal variations in flowering times. Additionally, the composition of fire adapted vegetation may vary depending on level of maturity or time since last burn. As far as possible, site collected data has been supplemented with desktop and database-centred distribution data.
- As far as possible, site collected data has been supplemented with desktop and database-centred distribution data as well as previous studies undertaken in the area.

2 Policy

2.1 Legislation Framework

In terms of NEMA EIA Regulations (07 April 2014, as amended), the following is applicable[1]:

- In terms of section 52 of NEMBA *(Activity (a)(i))*, the vegetation unit St Francis Dune Thicket, has a **Least Concern** status as per National Biodiversity Assessment (2022).
- In terms of the CBA classification (WCBSP, 2017), designated Critical Biodiversity Area and Protected Area overlaps partially with the site.

Listing Notice 1:

Activity 12: The development of—
(xii) infrastructure or structures with a physical footprint of 100 square metres or more.
where such development occurs—
(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse: —
excluding—
(dd) where such development occurs within an urban area; or
(ee) where such development occurs within existing roads or road reserves.

The proposed activity is on the edge of an urban area, with residential erven on two sides, but no erven on the east and northern sides, hence may be considered to be outside of an urban area.

Activity 15: The development of structures in the coastal public property where the development footprint is bigger than 50 square metres,

The proposed footprint will exceed 50m^2.

Activity 17: Development—
~~(i) in the sea.~~
~~(ii) in an estuary.~~
(v) if no development setback exists, within a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever is the greater.

in respect of—
(f) infrastructure with a development footprint of 50 square metres or more —
but excluding—
(dd) where such development occurs within an urban area.

The proposed footprint will exceed 50m^2 but is on the edge of an urban area, so may trigger (depends on specific local authority interpretation of urban area).

Activity 18: The planting of vegetation or placing of any material on dunes or exposed sand surfaces of more than 10 square metres, within the littoral active zone, for the purpose of preventing the free movement of sand, erosion or accretion, excluding where —
(i) the planting of vegetation or placement of material relates to restoration and maintenance of indigenous coastal vegetation undertaken in accordance with a maintenance management plan; or
(ii) such planting of vegetation or placing of material will occur behind a development setback.

The proposed listed activity is likely to be triggered due to construction of shower facilities on dunes or exposed sand surfaces.

1 *The listed activities itemized are only those with Biodiversity relevance to this report and is not a complete list.*

Activity 19: The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from—
(i) a watercourse.
(ii) the seashore.
(iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater—

The proposed activity will exceed the excavation of more than 5 cubic meters and is situated in proximity to an estuary.

Activity 27: The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—
(i) the undertaking of a linear activity; or
(ii) ~~maintenance purposes undertaken in accordance with a maintenance management plan.~~

The proposed activity will not require clearing of more than 1 Ha of indigenous vegetation.

Listing Notice 2:

None are applicable.

Listing Notice 3:

12. The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.
(a) In Eastern Cape, Free State, Gauteng, Limpopo, North-West and Western Cape provinces:
ii. Within critical biodiversity areas identified in bioregional plans.
iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or

The site footprint falls within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone. A portion of the site also overlaps with a designated CBA. In principle clearing of more than 300m² of indigenous vegetation may be required (Aerial cover of Milkwood trees and some remnant dune thicket exceeds 300m²), however more than 300m² of indigenous vegetation is unlikely to require clearing on the ground. The applicability of this listed activity will depend in part on how the construction will be implemented and is recommended to be included as a precautionary measure.

Activity 14: The development of—
(ii) infrastructure or structures with a physical footprint of 10 m² or more, where such development occurs—
(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse
(f) In Western Cape:
i. Outside urban areas, in:
(aa) A protected area identified in terms of NEMPAA, excluding conservancies.
(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.
(hh) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined.

The proposed activity will take place within or near an estuary functional zone, a portion of the site overlaps with a designated protected area and designated CBA and the structure will likely exceed 10m².

In terms of the EIA Listing Notices, listing notice 1 & 3, the activity is trigged as indicated above, thus requiring a Basic Assessment process.

Other potentially relevant legislation, which will be evaluated as required, includes the following:

- Liability for any environmental damage, pollution, or ecological degradation: Arising from all -related activities occurring inside or outside the area to which the permission/right/permit relates is the responsibility of the rights holder. The National Water Act and NEMA both oblige any person to take all reasonable measures to prevent pollution or degradation from occurring, continuing, or reoccurring (polluter pays principle). Where a person/company fails to take such measures, a relevant authority may direct specific measures to be taken and, failing that, may carry out such measures and recover costs from the person responsible.
- Public participation: Public consultation and participation processes prior to granting licences or authorisations can be an effective way of ensuring that the range of ways in which the activities impact on the environment, social and economic conditions are addressed, and considered when the administrative discretion to grant or refuse the licence is made.
- Constitution of Republic of South Africa (1996): Section 24(a) of the Constitution states that everyone has the right *'to an environment that is not harmful to their health or well-being'*. Construction activities must comply with South African constitutional law by conducting their activities with due diligence and care for the rights of others.
- Western Cape Nature and Environmental Conservation Ordinance 19 of 1974: Lists Protected species, requiring permits for removal (Department of Economic Development, Environmental Affairs and Tourism).
- Water Use Authorisations: The National Water Act (No. 36 of 1998): Requires that provision is made both in terms of water quantity and quality for 'the reserve', namely, to meet the ecological requirements of freshwater systems and basic human needs of downstream communities. It is essential in preparing an EMP that any impacts on water resources be they surface water or groundwater resources, and/ or impacts on water quality or flow, are carefully assessed, and evaluated against both the reserve requirement and information on biodiversity priorities. This information will be required in applications for water use licenses or permits and/or in relation to waste disposal authorisations.
- Conservation of Agricultural Resources Act 43 of 1993: Lists Alien invasive species requiring removal.

2.2 Systematic Planning Frameworks

A screening of Systematic Planning Framework for the region has been undertaken (summarised in Table 1), that included the following features:

- National Environmental Screening Tool
- Critically Endangered, Endangered and Vulnerable Ecosystems
- Critical Biodiversity and Ecological Support Areas
- River, Estuarine and Wetland Freshwater Ecosystem Priority Areas (FEPAs) and buffers
- Protected Areas (and buffers) and National Protected Area Expansion Strategy areas (NPAES).
- Critical Habitat for listed endemic or protected species.

Table 1: Summary of Regional Planning Biodiversity features.

FEATURE[2]	DESCRIPTION	IMPLICATIONS/COMMENT
National Environmental Screening Tool (Terrestrial Biodiversity)	Very High Terrestrial Biodiversity Low, & Medium & High Plant & Animal Species sensitivities Very High Aquatic sensitivity	CBA 1, FEPA, NPAES & SANParks Buffer Several Plant & Animal Species flagged by the screening tool. CBA 1, Estuary, FEPA, Wetlands
National Vegetation Map (NVM, 2018)	Goukamma Dune Thicket Estuary	Least Concern Non-Terrestrial

[2] Refer to Figure 10 to Figure 14.

FEATURE[2]	DESCRIPTION	IMPLICATIONS/COMMENT
Critically Endangered and Endangered Ecosystems (NBA 2018)	None	N/A
Vulnerable Ecosystems (NBA)	None	N/A
Western Cape Biodiversity Spatial Plan (2017)	Critical Biodiversity Area 1	No significant indigenous vegetation present within site, which is a developed urban erf.
Protected Areas (WC BSP)	Keurbooms River Nature Reserve – Seagull Colony	N/A
Protected Areas (WC BSP)	None	N/A
NPAES (Draft 2018)	Overlaps with edge of designated NPAES (Protected Area)	Activity is within a developed private Erf.
NPAES (2010)	None	N/A
Strategic Water Source Areas (SWSA)	None	N/A
Freshwater Ecosystem Priority Areas (FEPA's)	Overlaps with edge of Estuarine FEPA	Activity unlikely to have any direct impact on estuary.
Regional Hotspots & Regions of Endemism	Cape Floristic Region Hotspot	Specific activity and site unlikely to pose any risk to broader biodiversity hotspot.
Important Bird Areas (IBA's)	Overlaps with edge of designated Tsitsikamma-Plettenberg Bay IBA	Activity unlikely to have any direct impact on the IBA above baseline levels.
Key Biodiversity Areas (KBA's)	None	N/A
Marine/Coastal areas	Site abuts the Keurbooms River mouth (estuary and marine).	Activity unlikely to have any direct impact on estuary or coastal environment above current baseline levels.
RAMSAR sites	None	N/A
Within 32 m of Watercourse	None	N/A
Within 100 m of River	Site abuts the Keurbooms River estuary.	Activity unlikely to have any direct impact on estuary.
Estuary	Situated on the edge of an Estuary.	Activity unlikely to have any direct impact on estuary.
Within 500 m of Wetland	None	N/A
Forest	None	N/A
Surrounding Land Uses	Surrounding land primarily used for urban dwelling and recreational activities (beach and estuary).	Site and surrounding area are transformed and/or with scattered secondary vegetation elements.
Critical Habitat for listed endemic/ protected species	No specific populations of threatened species were identified within the footprint and the affected footprint is largely disturbed or comprised of secondary vegetation. There are several red listed species in the surrounding area and vegetation units that are known to have limited distributions, however none were recorded within the footprint.	

2.2.1 National Environmental Screening Tool

The DEA Screening Tool indicates the following, summarised in Table 1:

- Terrestrial Biodiversity is Very High (Figure 6).
- Plant species sensitivity is Low & Moderate (Figure 7).
- Animal Species sensitivity is High (Figure 8).
- Aquatic Sensitivity is Very High (Figure 9).

Table 2: Summary of Screening tool designations.

Terrestrial Sensitivity	**Feature(s) in proximity**
Very High	CBA 1: Terrestrial, FEPA Sub-catchment, National Protected Area Expansion Strategy (NPAES) & SANParks Buffer (Garden Route National Park)
High	None
Medium	None
Low	Present
Plant Sensitivity	
Very High	None
High	None
Medium	*Lampranthus pauciflorus, Lebeckia gracilis, Erica chloroloma, Erica glandulosa subsp. fourcadei, Hermannia lavandulifolia, Cotula myriophylloides, Acmadenia alternifolia, Muraltia knysnaensis, Erica glumiflora, Zostera capensis,* Sensitive species 657, 1032, 800, 500 & 763.
Low	Present
Animal Sensitivity	
Very High	None
High	*Circus ranivorus, Hydroprogne caspia, Neotis denhami, Bradypterus sylvaticus & Polemaetus bellicosus* (Birds)
Medium	*Afrixalus knysnae* (Amphibian), *Chlorotalpa duthieae*, Sensitive species 8 (Mammal), *Sarophorus punctatus* & *Aneuryphymus montanus* (Insects)
Low	Present
Aquatic Sensitivity	
Very High	CBA 1, Estuary (Keurbooms), FEPA Sub-catchment, Wetlands (Estuary)
High	None
Medium	None
Low	None

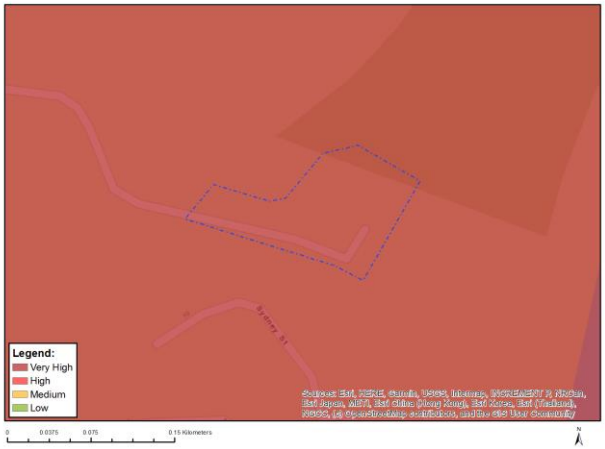

Figure 6: Terrestrial Biodiversity Sensitivity

Figure 7: Plant Species Sensitivity

Figure 8: Animal Species Sensitivity

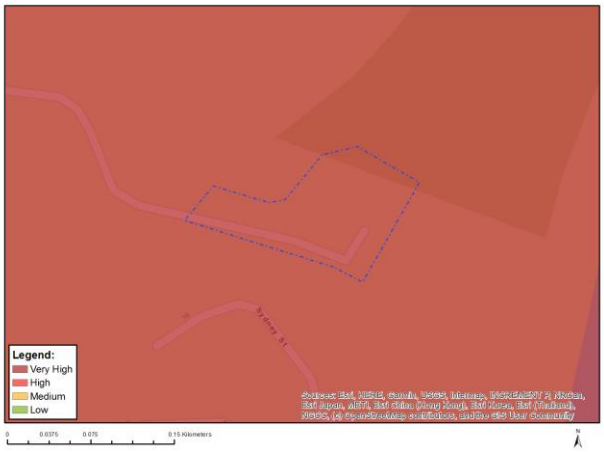

Figure 9: Aquatic Sensitivity

2.2.2 Vegetation of Southern Africa

The National Vegetation Type (NBA, 2018, Annexure A.2, Figure 10) indicated for the site and surrounding area are Goukamma Dune Thicket and Estuary, having a **Least Concern** status, as per National Biodiversity Assessment (2022).

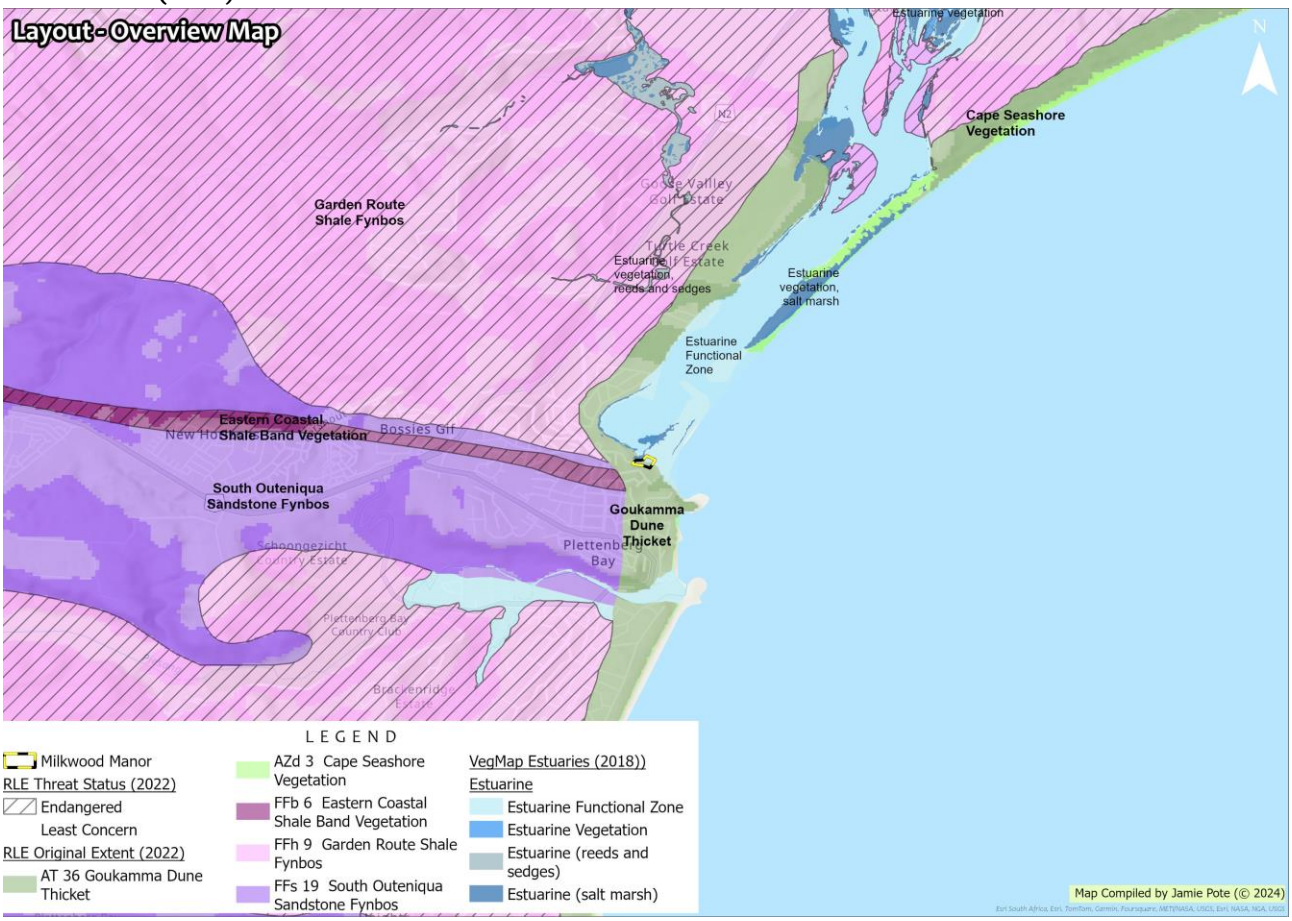

Figure 10: National Biodiversity Assessment Vegetation Type and Conservation Status (NBA, 2018).

Goukamma Dune Thicket (AT 36)

(Type history: STEP map Goukamma Dune Thicket (89 %); 2012 VEGMAP - FFd 11 Southern Cape Dune Fynbos (86 %), FFh 9 Garden Route Shale Fynbos (6 %))

Distribution: This vegetation type occurs in the Western Cape Province. In coastal stretches from Victoria Bay near Wilderness to the Knysna Heads, with smaller areas along the coast from Robberg Peninsula near Plettenberg Bay eastward to Keurboomstrand.
Vegetation & Landscape Features: On flat to moderately undulating coastal dunes. A mosaic of low to tall (1 - 5 m), dense thicket, dominated by small trees and woody shrubs with lianas abundant, in a mosaic of low (1 - 2 m) asteraceous fynbos. Thicket clumps are best developed in fire-protected dune slacks, which occasionally also support pockets of coastal forest (*Celtis africana*, *Ekebergia capensis*, *Searsia chirindensis*). The fynbos shrubland occurs on upper dune slopes and crests where succulents may be common in more open areas.
Geology and Soils: The area is dominated by Strandveld and Wankoe formations. Predominantly found on land type Hb.
Climate: Non-seasonal rainfall dominates the region with MAP between 588 mm and 859 mm. Frost is present for approximately 3 days per year. The mean monthly maximum is 26.67 °C in February and the mean monthly minimum is 7.92 °C in July. Altitude ranges from 1 - 203 masl.
Important Taxa: (d=dominant, e=South African endemic, et=possibly endemic to a vegetation type)

Small tree	*Pterocelastrus tricuspidatus* (d), *Schotia afra*, *Sideroxylon inerme* (d), *Tarchonanthus littoralis* (d)
Tall tree	*Afrocarpus falcatus*, *Calodendrum capense*, *Celtis africana*, *Ekebergia capensis*, *Olea capensis*, *Searsia chirindensis*
Succulent shrub	*Carpobrotus acinaciformis* (d), *Cotyledon orbiculata* (e), *Crassula nudicaulis*, *Euphorbia muirii*, *Gasteria acinacifolia*, *Zygophyllum morgsana*
Low shrub	*Eriocephalus paniculatus* (d), *Felicia echinata* (d), *Helichrysum patulum* (d), *Indigofera erect* (e)*a*, *Muraltia spinosa* (d), *Salvia africana-lutea* (d), *Muraltia knysnaensis* (e), *Selago burchellii* (e)
Graminoid	*Restio eleocharis* (d), *Stenotaphrum secundatum* (d), *Thamnochortus insignis* (e)
Tall Shrub	*Azima tetracantha*, *Carissa bispinosa*, *Mystroxylon aethiopicum*, *Cassine peragua* (d), *Cussonia thyrsiflora* (e), *Erica glandulosa subsp. fourcadei* (e), *Euclea racemosa* (d), *Grewia occidentalis*, *Gymnosporia capitata* (e), *Lauridia tetragona* (d), *Maytenus procumbens* (d), *Metalasia muricata* (d), *Morella cordifolia* (e), *Mystroxylon aethiopicum* subsp. *aethiopicum* (d), *Olea exasperata* (d), *Osteospermum moniliferum*, *Ptaeroxylon obliquum*, *Passerina rigida* (e), *Putterlickia pyracantha* (e), *Robsonodendron maritimum* (e), *Scutia myrtina*, *Searsia crenata* (d), *Searsia glauca* (d), *Searsia lucida*, *Searsia pterota* (e), *Zanthoxylum capense*
Herb	*Indigofera erecta* (e)
Woody Succulent Climber	*Cynanchum viminale*
Herbaceous Climber	*Rhoicissus digitata*, *Solanum africanum*

Estuarine

Predominantly Open Estuaries (including the Keurbooms River) are open to the sea for more than 90% of the time. Some are permanently open owing to perennial river flows or the presence of large tidal prisms. Tidal amplitude ranges from 0.75 - 1.5 m. Predominantly Open estuaries are linear systems in which mixing processes are dominated by both fluvial inputs and tidal action creating vertical and horizontal salinity gradients. Under low flows, hyper-salinity can develop in the upper reaches. The degree to which the mouth is restricted depends on the rate and volume of freshwater inflow. Some systems become severely constricted during low flow periods, decreasing the tidal amplitude and increasing the duration of the ebb tidal cycle. Regular flooding results in relatively mobile sediments. These estuaries usually support wetlands, salt marshes, macrophyte beds and marine and estuarine fauna. Surprisingly, their size varies considerably ranging from 10 to 7 500 Ha, with smaller systems afforded a degree of protection against direct wave action by rocky headlands or subtidal reefs, which assists in maintaining an open mouth.
Estuarine habitat that is present in the broader Keurbooms river estuary include the following:

- Submerged Macrophytes - Plants that are rooted in both soft subtidal and low intertidal substrata and whose leaves and stems are completely submerged for most states of the tide. Submerged macrophytes

tend to occur in permanently open estuaries, particularly Eelgrass (*Zostera capensis*) whereas *Ruppia cirrhosa* prefers the less saline and sheltered conditions of estuarine lakes and temporarily open/closed estuaries. *Stuckenia pectinata* (Ribbon Weed, Fennel Pondweed) prefers fresher conditions (salinity below 10) and therefore occurs in closed systems or in the upper reaches of estuaries. Submerged macrophytes are important primary producers in estuaries providing a source of food, refugia and nursery for invertebrates and fish. They play an important role in biogeochemical processes including oxygenating the water column during the growing season through photosynthesis, improving water clarity, nutrient trapping and recycling. The distribution and abundance of submerged macrophytes is threatened by a decline in water quality and smothering from macroalgal blooms and invasive aquatic plants.

- Salt Marsh - A suite of herbaceous vascular plants that are adapted to endure the extremes of salinity, desiccation and tidal flooding characterizes salt marshes. Common genera are *Sarcocornia, Salicornia, Triglochin, Limonium* and *Juncus*. Halophytic grasses such as *Sporobolus virginicus* and *Paspalum* spp. are common. Salt marsh plants show distinct zonation patterns along tidal inundation and salinity gradients. Zonation is well developed in estuaries with a large tidal range. Intertidal salt marsh occurs below mean high water spring and supratidal salt marsh above this. *Sarcocornia pillansii* is common in the supratidal zone and large stands can occur in estuaries. Salt marsh vegetation stabilizes the sediment protecting the banks of an estuary from eroding away. They are important filters of sediment and pollutants as well as zones of nutrient production and retention.
- Macroalgae - Macroalgae can be free floating or attached to rocks and other substrates. Filamentous macroalgae often form algal mats and increase in response to nutrient enrichment or calm sheltered conditions when the mouth of an estuary is closed. Typical genera include *Ulva* and *Cladophora*. Marine genera in estuaries are *Codium, Caulerpa, Gracilaria* and *Polysiphonia*. Increased nutrient loads due to agricultural runoff and wastewater input have resulted in increased incidences of macroalgal blooms.
- Sand and Mud Banks - This habitat provides a possible area for microphytobenthos to inhabit.
- Open Water Area - This is the habitat associated with the water column of an estuary and is measured as water surface area. Serves as a possible habitat for phytoplankton.

Since the proposed activity will occur within the terrestrial environment and will not directly affect any estuarine system, estuarine biodiversity impacts are not considered in detail in this report.

2.2.3 Western Cape Biodiversity Spatial Plan (WCBSP, 2017) – Terrestrial

The Western Cape Biodiversity Spatial Plan (2017, Figure 11) indicates the site falls on the edge of designated CBA 1 and Protected Area with the remainder being No Natural Area Remaining. Since the site is a developed Erf with only remnant Milkwood trees present and being on the edge of an urban area, the CBA 1 designation would be considered incorrect, and the entire site is situated within what should be designated No Natural Area Remaining (NNAR). No CBAs or ESA's are thus likely to be affected by the proposed activity above current baseline levels, as the proposed expansion of the buildings will occur on primarily developed or landscape portions of the Erf with the few remnant Milkwood trees requiring removal. These remnant Milkwood trees do not perform any substantial ecosystem service.

The WC BSP Protected Area designation (Keurbooms River Nature Reserve) does not align with the SAPAD Protected Area designation (None).

The Biodiversity Spatial Plan indicates areas of land as well as aquatic features which must to be safeguarded in their natural state if biodiversity is to persist and ecosystems are to continue functioning. Land in this category is referred to as a Critical Biodiversity Area. CBAs incorporate:

I. areas that need to be safeguarded in order to meet national biodiversity thresholds.
II. areas required to ensure the continued existence and functioning of species and ecosystems, including the delivery of ecosystem services; and/or
III. important locations for biodiversity features or rare species.

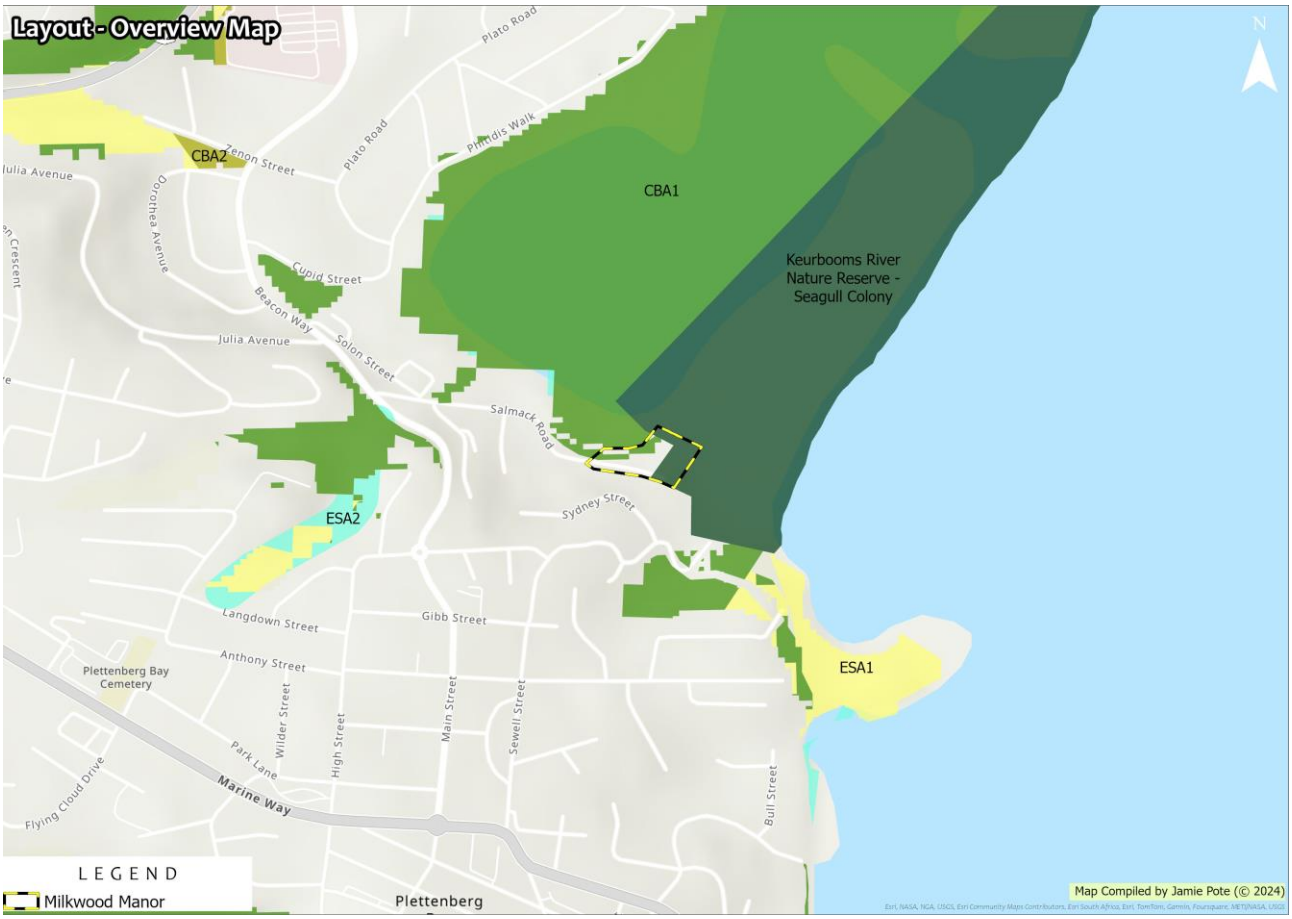

Figure 11: Western Cape Biodiversity Spatial Plan WCBSP, 2017) – Terrestrial.

Ecological Support Areas (ESAs) are supporting zones required to prevent the degradation of Critical Biodiversity Areas and Protected Areas. An ESA may be an ecological process area that connects and therefore sustains Critical Biodiversity Areas or a terrestrial feature. None are present withi the site or immediate vicinity. Defining criteria and recommended activities are summarised in Table 3 below.

Table 3: Criteria defining Critical Biodiversity Areas (Source: WC BSP, 2017)

CBA MAP CATEGORY:	DEFINING CRITERIA
Protected Areas (Present)	Areas that are proclaimed as protected areas under national or provincial legislation. Must be kept in a natural state, with a management plan focused on maintaining or improving the state of biodiversity. A benchmark for biodiversity.
Critical Biodiversity Areas 1 (CBA) (Present)	Areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure. Maintain 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.
Critical Biodiversity Areas 1 (CBA 2) (Not present)	Areas in a degraded or secondary condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure. Maintain in a functional, natural, or near-natural state, with no further loss of natural habitat. These areas should be rehabilitated.
Ecological Support Areas 1 (ESA 1) (Not Present)	Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PA's or CBA's and are often vital for delivering ecosystem services. Maintain in a functional, near-natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised.
Ecological Support Areas 2 (ESA 2) (Not Present)	Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PA's or CBA's and are often vital for delivering ecosystem services.

CBA MAP CATEGORY:	DEFINING CRITERIA
	Restore and/or manage to minimise impact on ecological infrastructure functioning; especially soil and water-related services.
Other Natural Areas (ONA) (Not Present)	Areas that have not been identified as a priority in the current systematic biodiversity plan but retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Although they have not been prioritised for biodiversity, they are still an important part of the natural ecosystem. Minimise habitat and species loss and ensure ecosystem functionality through strategic landscape planning. Offers flexibility in permissible land uses, but some authorisation may still be required for high-impact land uses.
No Natural Area Remaining (NNAR) (Present)	Areas that have been modified by human activity to the extent that they are no longer natural, and do not contribute to biodiversity targets. These areas may still provide limited biodiversity and ecological infrastructure functions, even if they are never prioritised for conservation action. Manage in a biodiversity-sensitive manner, aiming to maximise ecological functionality. Offers the most flexibility regarding potential land uses, but some authorisation may still be required for high impact land uses.

2.2.4 Garden Route Biodiversity Sector Plan (2010)

The Garden Route BSP (GRBSP, 2007) identified the vegetation as being Dune Thicket Mosaic Forest (Wilderness Forest Thicket, Figure 12). The Garden Route BSP further indicates the site as intersecting partially with designated Critical Biodiversity Area along the northern & eastern boundary. The Garden Route BSP is largely integrated with and/or superseded by the Western Cape BSP and National Vegetation Map but indicates that the later plans are broadly aligned with the earlier GRBSP.

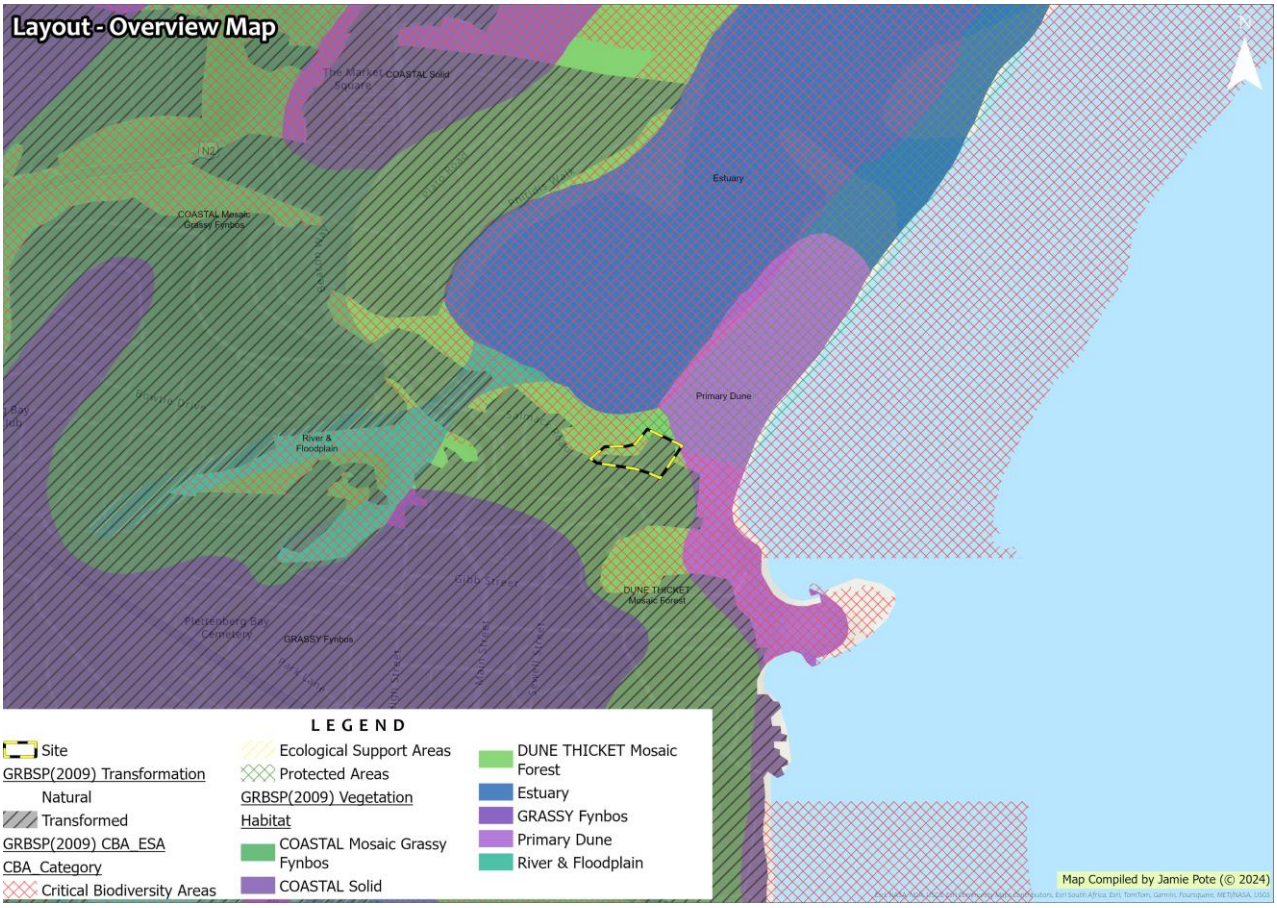

Figure 12: Garden Route Biodiversity Sector Plan (2007) vegetation designation and CBA/ESA status.

2.2.5 Key Biodiversity Areas

Important Bird Areas

The site is situated on the edge of the Tsitsikamma – Plettenberg Bay Important Bird Area. The Tsitsikamma-Plettenberg Bay Important Bird Area (IBA) is an ecologically significant region in South Africa. It originally covered the Tsitsikamma section of the Garden Route National Park, but its boundary has been extended westward to include important habitats around Plettenberg Bay. The Tsitsikamma section of the Garden Route National Park spans approximately 24,000 hectares and stretches for about 80 kilometres along the coast. It begins west of the Sout River near Nature's Valley and extends eastward to the Groot River. The IBA now also includes the entire Plettenberg Bay coastline and near-shore areas. The IBA encompasses diverse habitats, including steep coastal cliffs, gorges, fynbos, and forests. Notably, it includes the Keurbooms estuary spit, an essential breeding site for Kelp Gulls and other bird species.

The proposed activity, being situated on an already developed Erf, is unlikely to exceed current baseline impacts associated with the site on this IBA.

2.2.6 Protected areas

The South Africa Protected Areas Database (SAPAD) database, a comprehensive database of various protected area categories, is updated on a quarterly basis, and provides a comprehensive source of all national and private nature reserves, world heritage sites and other formal legally protected conservation areas situated within South Africa (Figure 13).

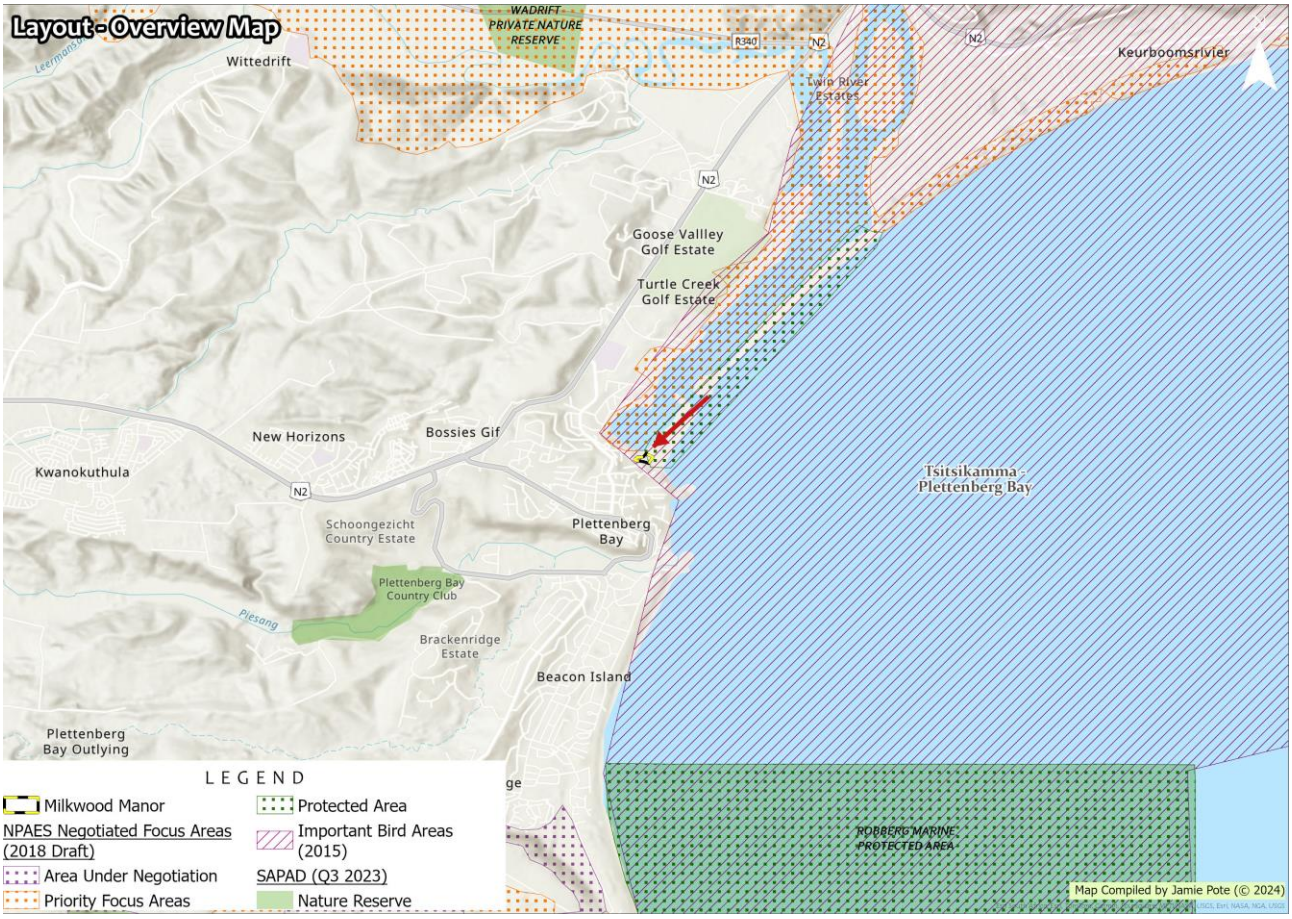

Figure 13: Protected Areas.

When projects are located in legally protected and internationally recognized areas, clients should ensure that project activities are consistent with any national land use, resource use, and management criteria (including Protected Area Management Plans, National Biodiversity Strategy and Action Plans (NBSAP's), or similar documents).

The proposed site does not overlap with any SAPAD designated Protected Areas but does overlap with designated NPAES Protected area (2018), Important Bird Area (Tsitsikamma – Plettenberg Bay IBA) and/or associated buffers. The Western Cape Biodiversity Spatial Plan designates a CapeNature Keurbooms River Nature Reserve (Seagull Colony) overlapping the site, which is not represented in the SAPAD designations.

The proposed activity, being situated on an already developed Erf, is unlikely to exceed current baseline impacts associated with the site on this IBA.

2.2.7 Rivers, Wetlands & Estuaries.

The site is situated on the western edge of the mouth of the Keurbooms River, with the Keurbooms River estuary on the north-eastern side and the beach on the south-eastern side. The Keurbooms River mouth is prone to migrating within a broader area and the site has been subject to periodic flooding during flooding of the river in the past, which required stabilisation of the outer north-east and south sides with rocks. The estuary abuts the site directly on the north and east sides. The Western Cape BSP Ecosystem Threat Status (2016) designates a *Least Threatened* status to the Keurbooms Estuarine Salt Marshes and Seashore Vegetation.

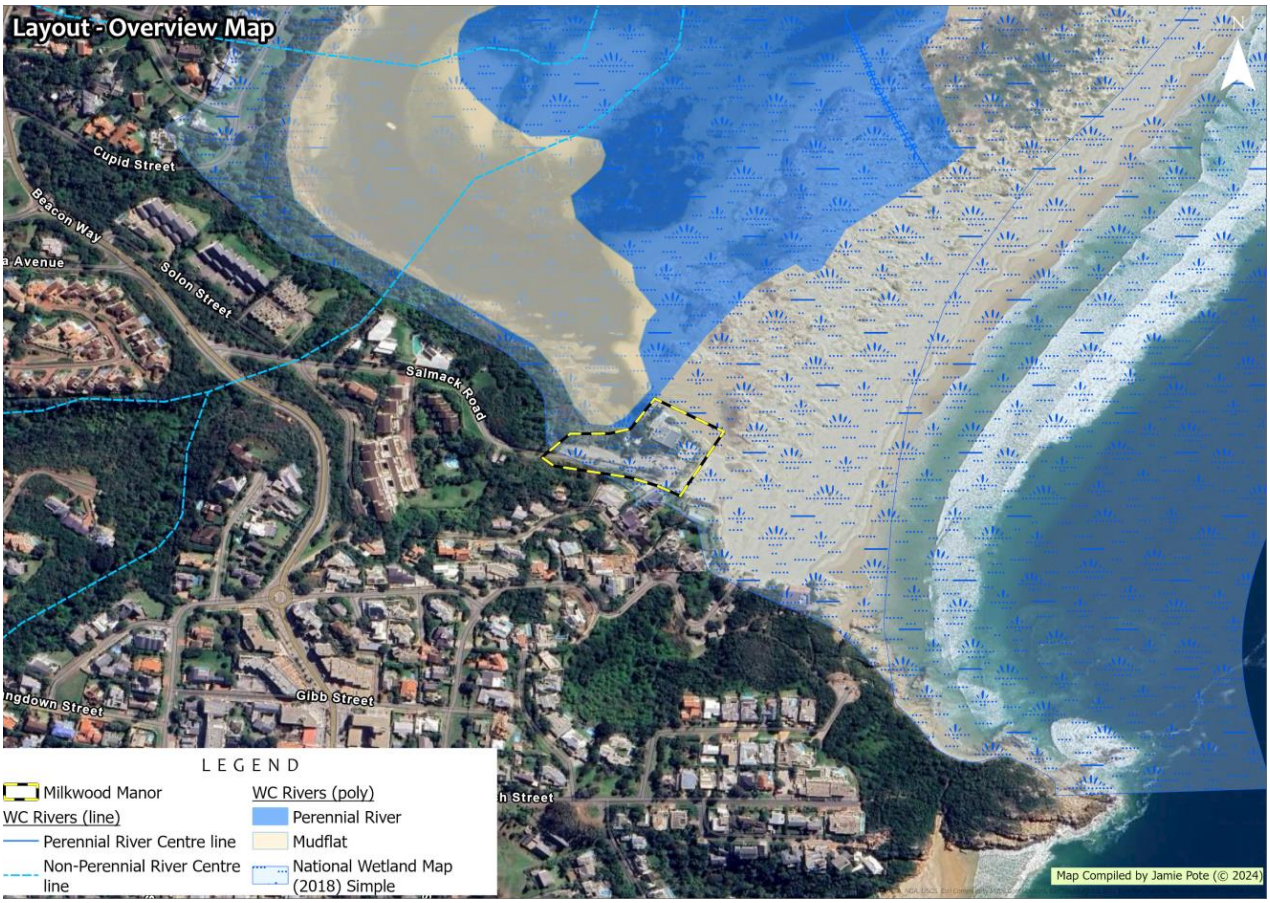

Figure 14: Rivers. Wetlands and Estuaries.

2.3 Vegetation and Ecological Processes and Corridors

Landscapes corridors are a combination of Critical Biodiversity Areas (areas required to meet conservation targets) and Ecological Support Areas that link upland and lowland habitats, as well as linking inland mountains to the coastline (and therefore beyond municipal boundaries). Rivers and their associated riparian, or riverbank habitats as well as estuarine habitat, including associated catchments, provide the basis for many of these large-scale (landscape level) ecological processes. Ecological Support Areas (ESA) are supporting zones or areas which must be safeguarded as they are needed to prevent degradation of Critical Biodiversity Areas and formal Protected Areas. Although many ESA's consist of natural veld, there are areas of land - partially or wholly transformed or degraded -that have been classified as ESA even though they are no longer in a natural state. Although these areas are heavily degraded or transformed, they still play an important role in supporting ecological processes. This is particularly the case with riparian areas, some key catchment areas, and key pieces of corridors.
While the site falls within a broader important ecological area, the specific site is a transformed developed Erf and thus will not contribute in any meaning manner to either conservation of ecosystems or ecological connectivity.

3 Biodiversity Risk Identification and Assessment

3.1 Baseline Biodiversity Description

The site is located within a transformed developed suburb and is specifically situated on the western edge of the Keurbooms River estuary, within what would have historically been a predominantly Dune Thicket vegetated area on the banks of the estuary (*Figure 16* to *Figure 31*). The eastern side of the site falls within the estuary itself and is prone to being eroded as the estuary is constantly migrating in an east-west direction, depending on the estuarine configuration at the time, which is known to change periodically.

The site is comprised predominantly of transformed areas which include the buildings, wooden decks, parking areas, landscaped gardens and rock revetments around the boundary with the estuary. A few remnant Milkwood trees remain on the site (Figure 32), with a nominal understorey of natural elements remaining. As well as a small pocket of remnant Dune Thicket at the beach access point. This remnant pocket includes a few individuals of species including *Tarchonanthus littoralis, Carpobrotus acinaciformis, Eriocephalus paniculatus, Helichrysum patulum, Selago burchellii, Stenotaphrum secundatum, Azima tetracantha, Carissa bispinosa, Euclea racemosa, Grewia occidentalis, Metalasia muricata, Scutia myrtina, Searsia crenata, Cynanchum viminale & Cynanchum ellipticum.*

The landscaped or ornamental gardens comprise a mix of ornamental species including several indigenous species such as *Cotyledon* spp., *Aloe* spp. And several large Cycads (*Encephalartos*), which are in principle protected in terms of the Provincial Nature Conservation Ordinance. None of the naturally occurring Dune Thicket elements are protected, other than the Milkwood tress, which have a NFA (National Forests Act) protection. Milkwood trees are very widespread (occur along the entire south and east coast of south Africa into Mozambique and Limpopo), and removal will not have any significant impact to the broader conservation of the species.

Figure 15: Aerial photo of the site (site boundary extended slightly outside of Erf boundaries to match site development plans).

Figure 16: Typical landscaped gardens.

Figure 17: Typical landscaped gardens.

Figure 18: Typical landscaped gardens.

Figure 19: Typical landscaped gardens.

Figure 20: Typical landscaped gardens.

Figure 21: Typical landscaped gardens.

Figure 22: Typical remnant Milkwood tree with dune thicket elements.

Figure 23: Typical remnant Milkwood tree with dune thicket elements.

Figure 24: Typical remnant Milkwood tree with dune thicket elements.

Figure 25: Small remnant Dune Thicket clump at beach assess.

Figure 26: Estuarine area to the north of the site.

Figure 27: Estuarine area to the east of the site.

Figure 28: Unvegetated/partially vegetated coastal sands oto the south.

Figure 29: Partially vegetated coastal sands to the south-east.

Figure 30: Heavily invaded vegetation between parking area and estuary.

Figure 31: Heavily invaded vegetation between parking area and estuary.

The proposed development is unlikely to have any significant impact on any indigenous vegetation, other than the removal and/or pruning of the Milkwood trees and nominal clearing of some understorey dune thicket vegetation and a small patch of remnant dune thicket at the beach access point, as most of the additions and alterations will occur within the transformed or landscaped areas. Remnant dune thicket as indicated includes primarily the remnant Milkwood trees with some understorey coverage but is not ecologically functional, other than having a few Milkwood trees and a few common understorey species.

Table 4: Approximate coverage areas of habitat in square meters.

HABITAT	SENSITIIVTY	AREA (SQUARE METERS)
Remnant Dune Thicket	Moderate	~ 904
Invaded	Low	~ 454
Bare Sand	Low	~ 1 076
Landscaped	Low	~ 2 824
Structures	Low	~ 1 584
Tarmac	Low	~ 3 022
TOTAL		**~ 9 863**

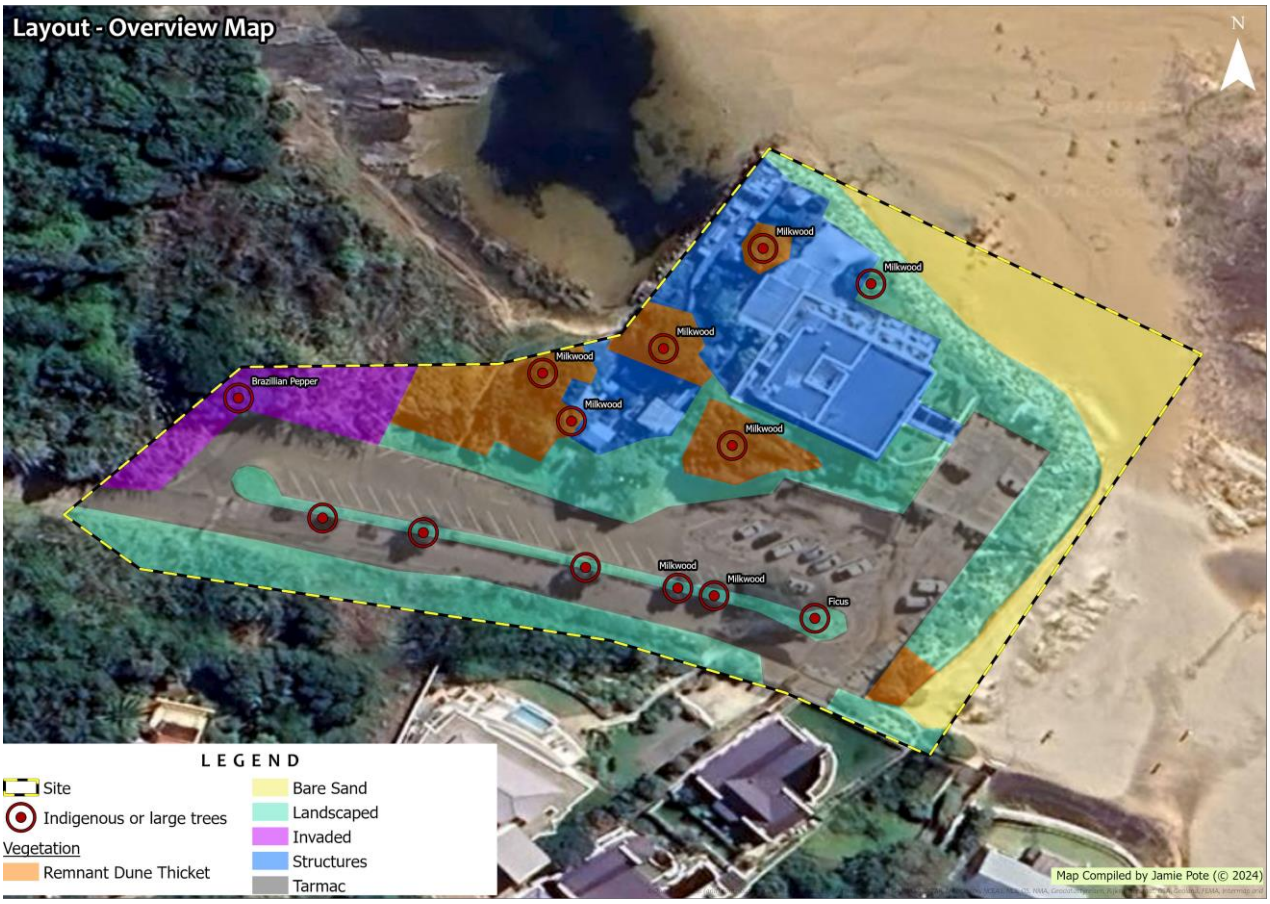

Figure 32: Mapped vegetation of the site.

3.1.1 Present Ecological State

In summary, the following general observations can be noted regarding the site:

- The area in and around the site is completely transformed to urban development on the western side, with a few remnant thicket species and pockets on developed and undeveloped adjacent erven.
- The area to the north, east and south of the site is comprised mostly of bare sand, with estuary being on the north, occasionally on the east and beach with unvegetated sand on the south and south-east.
- Alien invasion is presently moderate, in particular the area between the parking area and the estuary.
- A few remnant Milkwood trees are present within the site. No natural PNCO protected species are present within the remnant dune thicket pockets (i.e. under the Milkwood trees). However, several of the species used for landscaping purposes would be considered to be PNCO species.

3.1.2 Flora & Fauna

No endemic and range restricted species were recorded to be present. Several species are known from the surrounding area, but unlikely to be affected by the proposed activity.

Red Listed, Endemic and Protected Flora

The site falls within the general distribution range of several endemic species and other species with a highly localised distribution, some of which are Critically Endangered, Endangered, Vulnerable or Rare. Some of these species are also only from a single or a few populations.

As per Table 5, no Endangered or Critically Endangered flora species were confirmed to be present nor are known to be present in the affected area. Several Milkwood trees are present within the Erf and NFA (National Forest Act) permits will be required for their removal in order to undertake construction.

Table 5: Flora Species of Special Concern

SCIENTIFIC NAME	STATUS[3]	COMMENT/PRESENCE
Acmadenia alternifolia	NEST (M), Vu	Very restricted along the coastal headlands from Plettenberg Bay in the East to Knysna in the West, and 10-30 km inland from the coast north of Nature's Valley in the East to Bergplaas north of Sedgefield in the West. Habitat generally not suited for housing. Not recorded on site.
Cotula myriophylloides	NEST (M), Cr	Submerged in seasonal coastal pools, but also in marshes and on wet sand. Mostly in brackish, but also fresh, still or slowly moving water. Records from Plettenberg Bay area. Not recorded on site and no suitable habitat.
Encephalartos spp.	PNCO, CITIES	Several cycads are present along the road verges in landscaped gardens. Likely cultivated species, species not typically occurring in natural coastal Dune Thicket/Fynbos.
Erica chloroloma	NEST (M), Vu	Somewhat widespread distribution. Not recorded on site.
Erica glandulosa ssp. fourcadei	NEST (M), Vu	Somewhat widespread distribution. Not recorded on site but found in surrounding area. Landscaped road verges do not provide suitable habitat for this species.
Erica glumiflora	NEST (M), Vu	Somewhat widespread distribution. Not recorded on site.
Hermannia lavandulifolia	NEST (M), VU	Somewhat widespread distribution. Not recorded on site.
Lampranthus pauciflorus	NEST (M), En	EOO 1270 km², 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. Not recorded on site.
Lebeckia gracilis	NEST (M), En	Somewhat widespread distribution. Records from Plettenberg Bay area. Not recorded on site.
Muraltia knysnaensis	NEST (M), EN	EOO 2046 km², between three and eight severely fragmented subpopulations remain on remnants of natural habitat after most of this species' habitat has been transformed for crop cultivation, forestry plantations and coastal development around Knysna and Plettenberg Bay. Not recorded on site but found in surrounding area. Landscaped road verges do not provide suitable habitat for this species.
Sensitive species 1032	NEST (M), Vu	Somewhat widespread distribution including a population around St Francis. Not recorded on site but found in surrounding area. Landscaped road verges do not provide suitable habitat for this species.
Sensitive species 500	NEST (M), En	Somewhat widespread distribution. Not recorded on site.
Sensitive species 657	NEST (M), EN	Somewhat widespread distribution. Not recorded on site.
Sensitive species 763	NEST (M), Vu	Localised distribution George & possibly extending to De Hoop. Not recorded on site.
Sensitive species 800	NEST (M), Vu	Formerly a very common species, now remaining mostly as small, isolated subpopulations on fragments of natural vegetation within its lowland distribution range. Not recorded on site but found in surrounding area. Landscaped road verges do not provide suitable habitat for this species.
Sideroxylon inerme (Southern White Milkwood)	NFA	Several individuals, likely remnant of original Dune Thicket which were retained during clearing of the site. NFA permits would be required to prune, trim or remove.
Zostera capensis	NEST (M), En	Widespread across the South African coast and occurs in 62 estuaries. But with a very small area of occupancy (AOO) of between 15-18 km², obviously due to relatively small estuarine coverage. It has been extirpated from two estuaries due to development and human disturbance. Occurs in the intertidal zone of permanently open estuaries. Present in adjacent estuary, unlikely to be affected by proposed activities which are outside of the estuarine zone.

3 **PNCO -** Provincial Nature Conservation Ordinance (1974); **NFA** - National Forests Act of (1998); ToPS – Threatened or Protected Species; **IUCN:** CR - Critically - Endangered, En - Endangered, Vu - Vulnerable; LC - Least Concern.

A NFA (National Forests Act) permit for small *Sideroxylon inerme* (Milkwood trees) that may require pruning or removal for the proposed activity. PNCO (Provincial Nature Conservation Ordinance) permits may be required for the removal or relocation of the Cycads, which are not present in a natural context, if necessary.

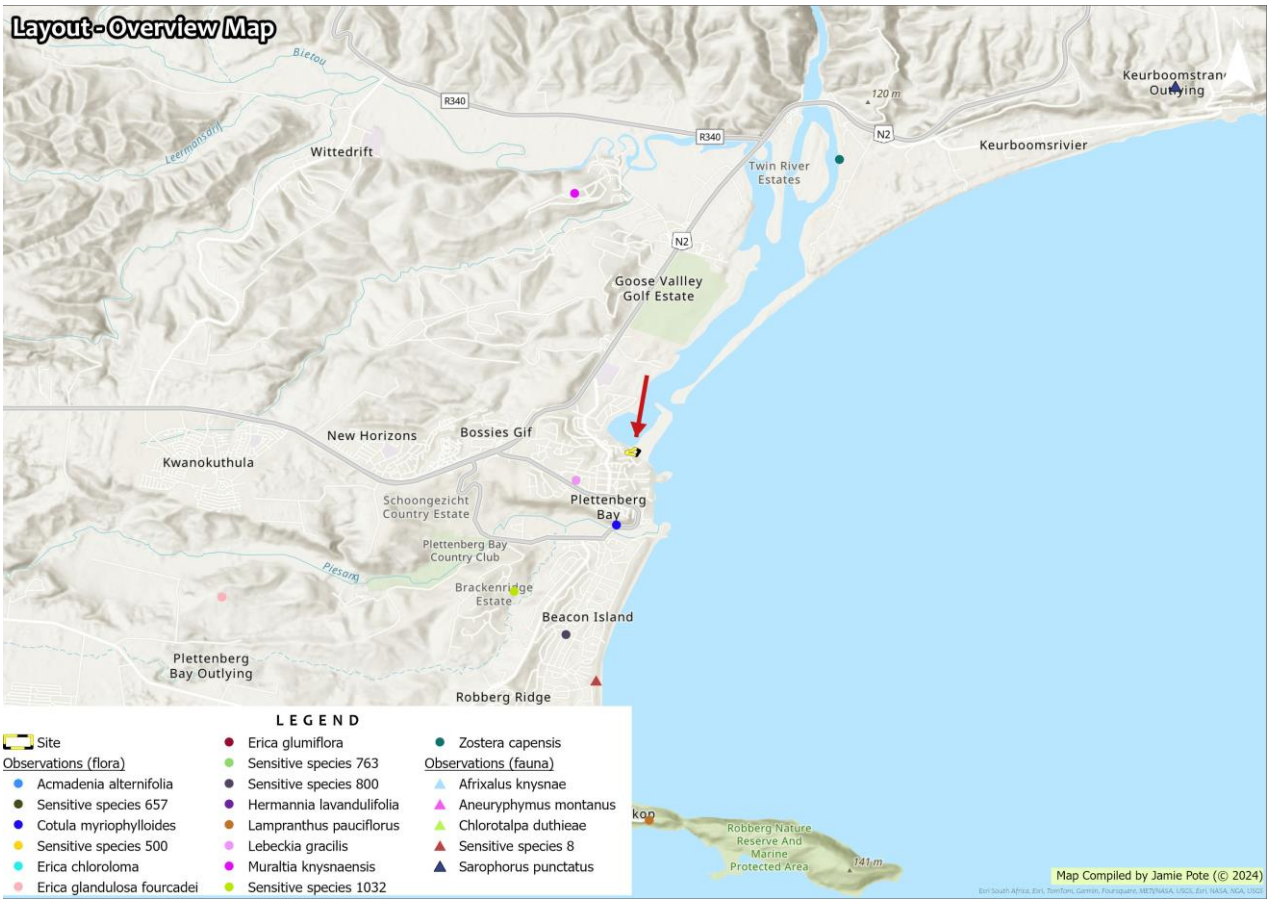

Figure 33: Distribution records of flora and fauna Species of Conservation Concern (GBIF, 26 July 2024) with known records in the vicinity of the site. NOTE some distribution records may have an offset for biosecurity purposes and/or accuracy errors but will non the less give an indication of general locality.

Red Listed and Protected Fauna

As per Table 6, no Endangered or Critically fauna species were found to be present nor are known to be present in close proximity to the affected area or are likely to be directly affected by the proposed activity. The site falls within the general distribution range of a single faunal SCC as indicated in Table 6 below, however none are confirmed to be present. Since the project footprint is relatively small, is situated directly adjacent to urban and disturbed areas and also surrounded by extensive outlying areas of natural habitat, any disturbance or displacement associated with increased activity or habitat destruction as a direct result of the activity is unlikely to pose a significant negative impact faunal species and in particular the species of special concern.

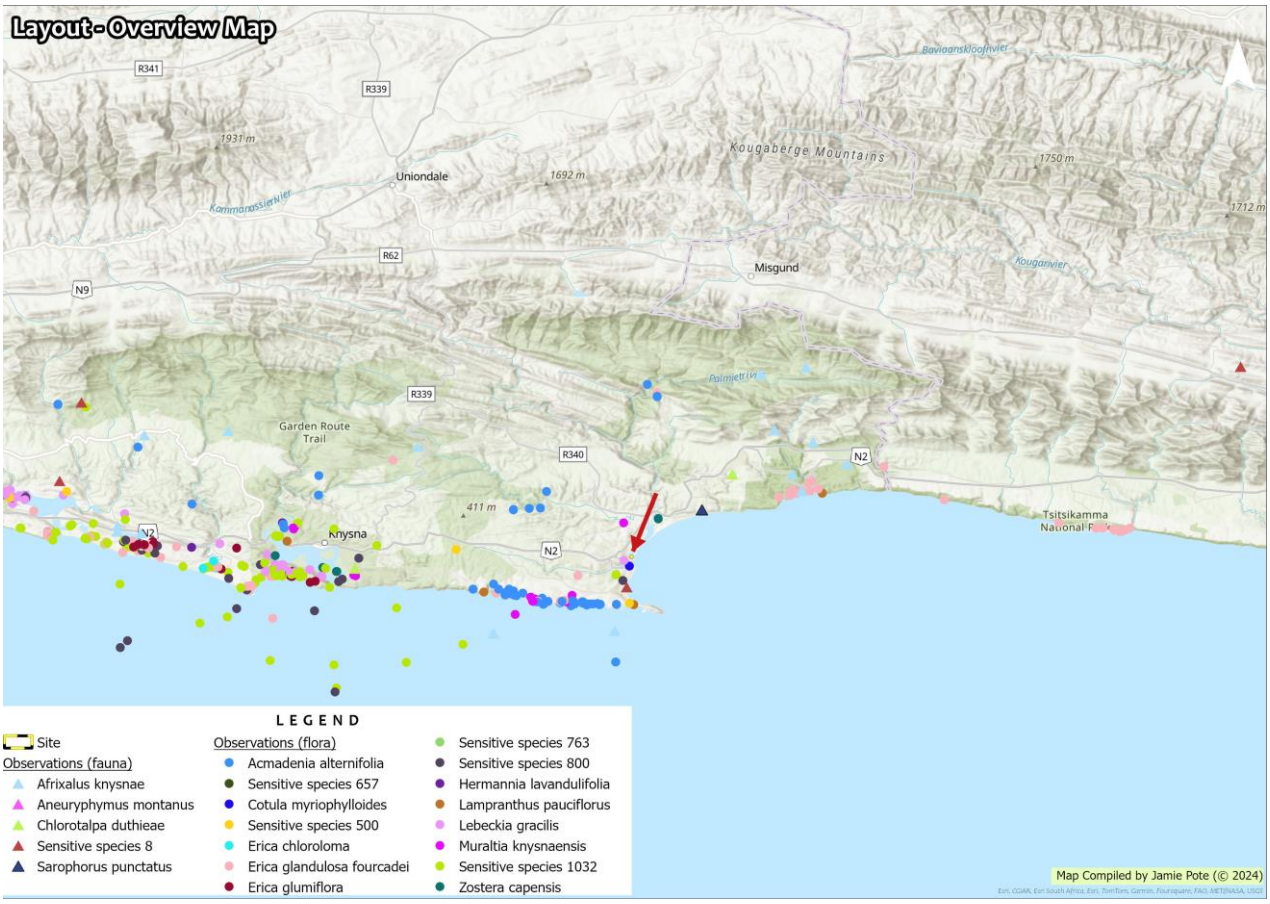

Figure 34: Distribution records of flora and fauna Species of Conservation Concern (GBIF, 26 July 2024) with known records from the broader area. NOTE some distribution records may have an offset for biosecurity purposes but will non the less give an indication of general locality (i.e. locality records in the sea).

Table 6: Fauna Species of Special Concern (SCC)

SCIENTIFIC NAME	COMMON NAME	STATUS[4]	COMMENT/PRESENCE
Mammals			
Chlorotalpa duthieae	Duthies Golden Mole	NEST (M), Vu	Known form the broader area, no evidence of any Golden Moles on site, which is primarily a landscaped garden and largely surrounded by compacted material.
Sensitive species 8		NEST (M), Vu	Not recorded on site but found in surrounding area. May be a transient visitor in developed areas, but not likely to be affected above baseline levels due to the proposed activity within an already developed Erf.
Birds			
Bradypterus sylvaticus	Knysna warbler	NEST (H)	Unlikely to be affected above baseline levels by the proposed activity in an already transformed Erf & footprint.
Circus ranivorus	African Marsh Harrier	NEST (H)	
Hydroprogne caspia	Caspian Tern	NEST (H)	
Neotis denhami	Denham's Bustard	NEST (H)	
Polemaetus bellicosus	Martial eagle	NEST (H)	
Reptiles			
None			
Amphibians			

4 **PNCO -** Provincial Nature Conservation Ordinance (1974); ToPS – Threatened or Protected Species, **IUCN:** Cr - Critically - Endangered, En - Endangered, Vu - Vulnerable; LC - Least Concern.

SCIENTIFIC NAME	COMMON NAME	STATUS[4]	COMMENT/PRESENCE
Afrixalus knysnae	*Knysna Spiny Reed Frog*	NEST (M), En	Unlikely to be present nor affected by the proposed temporary activity in a transformed & developed Erf. Not recorded.
Invertebrates			
Aneuryphymus montanus	Yellow-winged Agile Grasshopper	NEST (M), Vu	No records from vicinity and not recorded on site. Unlikely to be present nor affected by the proposed temporary activity in a transformed & developed Erf. Not recorded.
Sarophorus punctatus	Dung beetle	NEST (M), En	Known record from Keurboomstrand area. Unlikely to be present nor affected by the proposed temporary activity in a transformed & developed Erf. Not recorded.

No fauna PNCO permits are anticipated to be required but are recommended as a precaution as small species such as lizards, geckos and snakes may be present in the rocky landscaped areas.

Alien Invasive Species

On 18 September 2020, the Minister of Environmental Affairs published the Alien and Invasive Species Regulations ("the Regulations") which came into effect on the 18 October 2020 in a bid to curb the negative effects of IAPs. The Regulations call on landowners and sellers of land alike to assist the Department of Environmental Affairs to conserve our indigenous fauna and flora and to foster sustainable use of our land. Non-adherence to the Regulations by a landowner or a seller of land can result in a criminal offence punishable by a fine of up to R 5 million (R 10 million in case of a second offence) and/or a period of imprisonment of up to 10 years.

Category 1a and 1b listed invasive species must be controlled and eradicated. Category 2 plants may only be grown if a permit is obtained, and the property owner ensures that the invasive species do not spread beyond his or her property. The growing of Category 3 species is subject to various exemptions and prohibitions. Some invasive plants are categorised differently in different provinces. *For example*: the Spanish Broom plant is categorised as a category 1b (harmful) invasive plant in Eastern Cape and Western Cape, but it is a category 3 (less harmful) invasive plant in the other seven provinces.

Invasive alien plants have a significant negative impact on the environment by causing direct habitat destruction, increasing the risk and intensity of wildfires, and reducing surface and sub-surface water. Landowners are under legal obligation to control alien plants occurring on their properties. Alien Invasive Plants require removal according to the Conservation of Agricultural Resources Act 43 of 1983 (CARA) and the National Environmental Management: Biodiversity Act (10 of 2004; NEMBA): Alien and Invasive Species Lists (GN R598 and GN R599 of 2014). Alien control programs are long-term management projects and a clearing plan, which includes follow up actions for rehabilitation of the cleared area, is essential. This will save time, money, and significant effort. Collective management and planning with neighbours allow for more cost-effective clearing and maintenance considering aliens seeds as easily dispersed across boundaries by wind or water courses. All clearing actions should be monitored and documented to keep track of which areas are due for follow-up clearing. A general rule of thumb is to first target lightly infested areas before tackling densely invaded areas and prioritize sensitive areas such as riverbanks and wetlands. Alien grasses are among the worst invaders in lowland ecosystems adjacent to farms but are often the most difficult to detect and control.

Several exotic invasive and other weed species were noted within the site and surrounding area. Proliferation of weedy and exotic species often indicate disturbance especially during or after construction. A list of species is included in Table 7. During construction it is highly likely that species

currently not on site could be introduced through the construction process. A weed management programme is recommended after construction to counter the weed proliferation that would be expected after construction.

Table 7: Alien (exotic) invasive and other weed species and status.

SCIENTIFIC NAME	COMMON NAME	FAMILY	STATUS[5]	PRESENCE
Acacia cyclops	Rooikrantz	Fabaceae	CARA 1b	Present, odd individual/clump
Cestrum laevigatum	*Inkberry*	Solanaceae	CARA 1b	Present common between parking and estuary.
Pennisetum clandestinum	Kikuyu	Poaceae	CARA 1b	Present, odd individual/clump
Phragmites australis	*Spanish Reed*	Poaceae	CARA 1b	Present common between parking and estuary.
Ricinus communis	Castor Oil Plant		CARA 2	Present, odd individual/clump
Solanum mauritianum	Bugweed	Solanaceae	CARA 1b	Present, odd individual/clump
Solanum sisymbriifolium	Wild tomato	Solanaceae	CARA 1b	Present, odd individual/clump

Eradication protocol

The act required the removal of these species, being the responsibility of the landowner/contractor. Several other common weed species are also present which should also be managed as part of post construction management,

Specific eradication and management procedures must be stipulated in the EMP as to the methods to be implemented to remove and control the various alien invasive species as they tend to require species specific techniques. A management plan should be incorporated into the EMP, and a detailed action plan compiled and implemented by the ECO.

3.1.3 Aquatic Habitat

Aquatic systems do not function in isolation and in terms of ecological processes, the aquatic systems are intricately linked to the terrestrial system. In this case the estuarine community that runs past the border of the site forms an integral link between upstream and downstream communities and as a corridor for various faunal especially avifaunal species.

The site is situated adjacent to the Keurbooms River estuary. The estuarine habitat is outside the scope of this terrestrial biodiversity assessment.

3.1.4 Terrestrial Vegetation Sensitivity Assessment

An overall vulnerability assessment of proposed activity, incorporating key vegetation and ecological indicators was undertaken and includes the following key criteria:

- relative levels of *intactness* in terms of overall loss of indigenous vegetation cover.
- presence, diversity, and abundance of *species of special concern* (weighted in favour of local endemic species).
- extent of *invasion* (severity and overall ecological impact), as well as the degree to which successful rehabilitation could take place.
- overall degradation incorporating above factors.
- relative importance of the vegetation communities relative to regional conservation status - indicated as vulnerability of the area because of loss.

[5] CARA - Conservation of Agricultural Resources Act (1993); National List of Invasive Species in Terms Sections 70(1), 71(3) and 71A (2016).

Intactness

Three basic classes are differentiated as follows:

- **Low**: > 75 % of original vegetation has been removed or lost; and/or no species of special concern present that are critically endangered, endangered, or endemic with highly localised distribution.
- **Moderate**: 25 - 75 % of original vegetation has been removed/lost; and or presence of species of special concern but not having high conservation status or high levels of endemicity or highly localised distributions.
- **High**: < 25 % of original vegetation has been removed or lost; and or presence of species with a highly endemicity and or high conservation status (endangered or critically endangered).

Intactness for the site is **Very Low**.

Alien Invasion

Three classes are differentiated as follows:

- **Low**: no or few scattered individuals.
- **Moderate**: individual clumps of invasives present but cover less than 50% or original area.
- **High**: dense, impenetrable stands of invasives present, or cover > 50 % of area with substantial loss functioning. Rehabilitation will most likely require specialised techniques over an extended period (> 5 years).

Alien invasion for the site is **Low to Moderate**.

Degradation

Overall Degradation is determined from the above alien invasion and intactness scores, according to the following matrix:

INTACTNESS	INVASION		
	LOW	MODERATE	HIGH
High	Pristine	Near Pristine	Moderately Degraded
Moderate	Near Pristine	Moderately Degraded	Severely Degraded
Low	Moderately Degraded	Severely Degraded	Transformed

Degradation for the site is **High to Very High** (Transformed)

Overall Sensitivity score

Overall vulnerability (or Sensitivity) of the vegetation within the site is calculated according to the following matrix which combines degradation and overall conservation status of the vegetation units of the site.

DEGRADATION	CONSERVATION STATUS			
	LEAST CONCERN	VULNERABLE	ENDANGERED	CRITICALLY ENDANGERED
Severely degraded/ Transformed	**Very Low/Low**	Low	Moderate	Moderate - High
Moderately degraded	**Low**	Moderate	High	High
Ecologically Pristine or near Pristine (no such areas identified, excluding he estuarine habitat)	**Moderate**	Moderate - High	High	Very High (No-Go area)

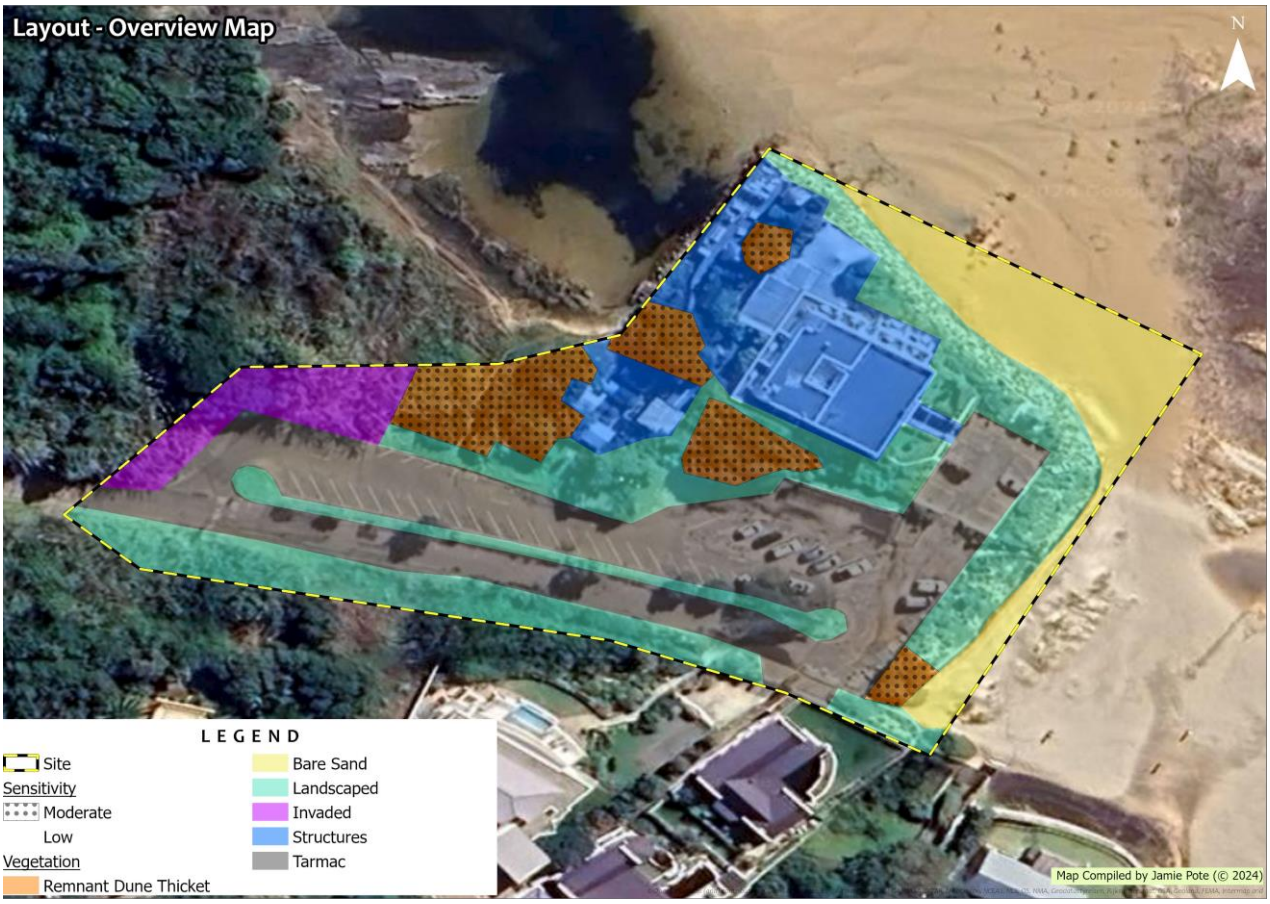

Figure 35: Vegetation Sensitivity of proposed site.

Habitat Sensitivity

- Portions of the site having a LOW sensitivity include almost the entire site where landscaped areas, parking and buildings are present.
- A few minor MODERATE sensitivity portions are designated where Milkwood trees and/or remnant dune thicket is present, which are small in size and have a negligible ecological value in the context of the site and broader area, other than perhaps visual appeal.
- No VERY HIGH sensitivity areas are identified, but limited to the terrestrial environment and excludes the estuary, which is outside of the site footprint and addressed as part of a separate specialist assessment.

3.1.5 Critical Habitat

The following Critical Habitat features have been identified within the site:

1. Criterion 1: Habitat for Critically Endangered (CR) and/or Endangered (EN) species
    - No Endangered or Critically Endangered Flora species were recorded. Several species known from general area were screened to confirm that none are present or affected.
    - No Endangered Mammals, Reptiles, Amphibians, or Invertebrates are likely to be affected (other than temporary displacement during construction for transient species).
2. Criterion 2: Habitat for Endemic or restricted-range species
    - Although several range restricted flora species are potentially present in the surrounding area and vegetation types, none were recorded in proximity to the site.
3. Criterion 3: Habitat for Migratory or congregatory species
    - No such terrestrial habitat will be directly or indirectly affected.

4. Criterion 4: Habitat for Highly threatened and/or unique ecosystems
    - No such habitat is present or affected.
5. Criterion 5: Habitat for Key evolutionary processes
    - No such terrestrial habitat will be directly or indirectly affected.

3.1.6 No-Go Areas

No-go areas are not identified within the site. Caution to be exercised in proximity to planted Cycads.

3.1.7 Potential Development Footprints

The remainder of the site outside of the identified no-go areas above is considered to be developable.

3.2 Risks and Potential Impacts to Biodiversity

3.2.1 Summary of actions, activities, or processes that require mitigation.

The main impacts associated with the unauthorised activity include the following:

1. Permanent or temporary loss of indigenous vegetation cover.
2. Loss of Flora Species of Conservation Concern.
3. Susceptibility of post construction disturbed areas to invasion by exotic and alien invasive species.
4. Susceptibility of some areas to wind and water erosion associated with the adjacent estuary and dune systems.
5. Disturbances to ecological processes.
6. Aquatic and Riparian processes.
7. Loss of Faunal Species of Conservation Concern.
8. Loss of Faunal Habitat and processes.

3.2.2 Potential Terrestrial Biodiversity Impacts (Indirect)

No significant indirect impacts are anticipated.

3.2.3 Potential Terrestrial Biodiversity Impacts (Direct)

Overall impacts to terrestrial biodiversity are likely to be nominal, with loss resulting from removal or pruning of some Milkwood Trees and remnant Dune Thicket. As indicated in Figure 36 & Figure 37, the proposed activity will require clearing of some remnant dune thicket areas in order to construct the building extensions, additional parking, public ablution facilities and beach shower for both the preferred and alternative Site Development Plans. The difference in impact between the preferred and alternative Site Development Plans will be negligible.

Subsequent to the initial public review period, comments relating to the proposed beach access and beach shower have resulted in the applicant having revised the layouts including the preferred and alternative layouts. The revised layouts as described above will result in no significant changes to the terrestrial biodiversity impacts, neither direct nor indirect as per the sensitivity overlays provided below.

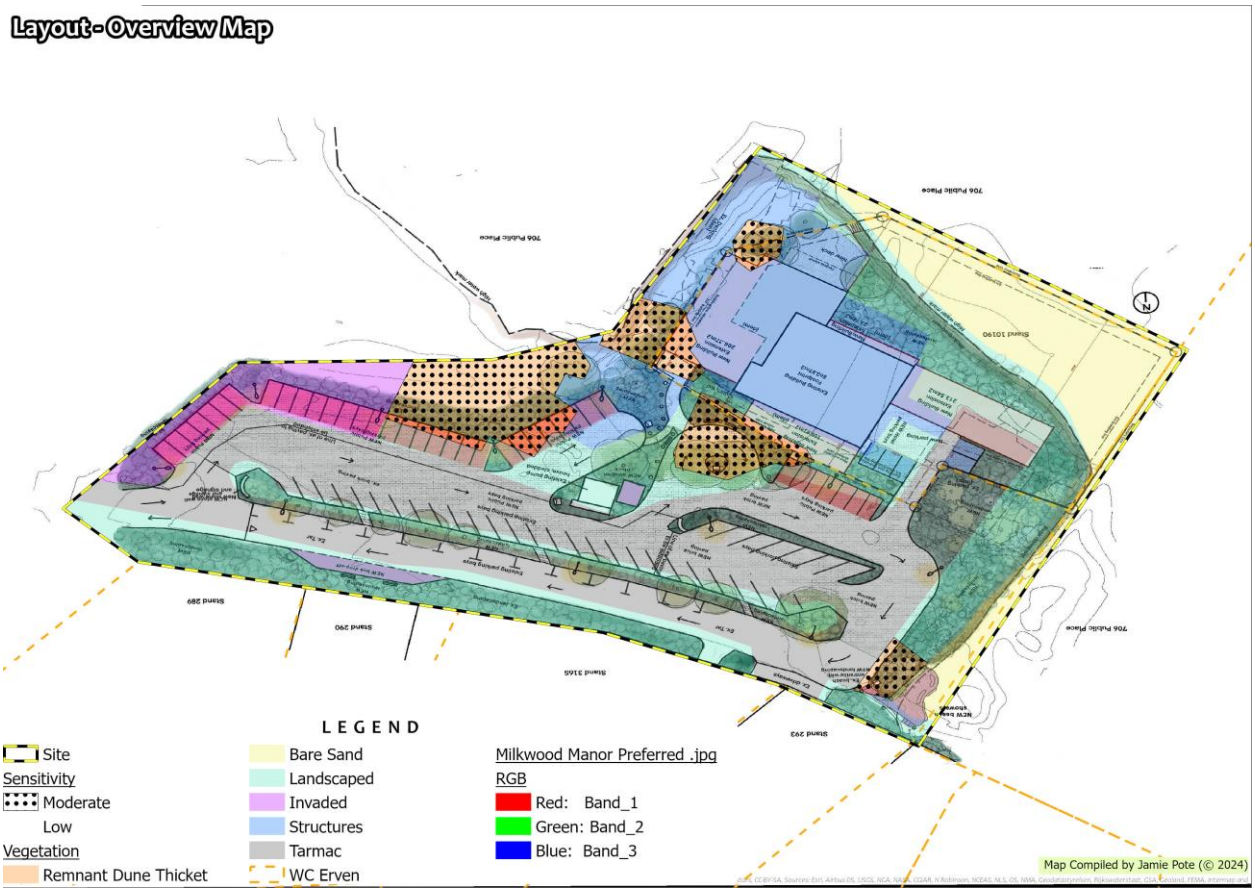

Figure 36: Vegetation Sensitivity with Preferred Site Development Plan (previous preferred layout).

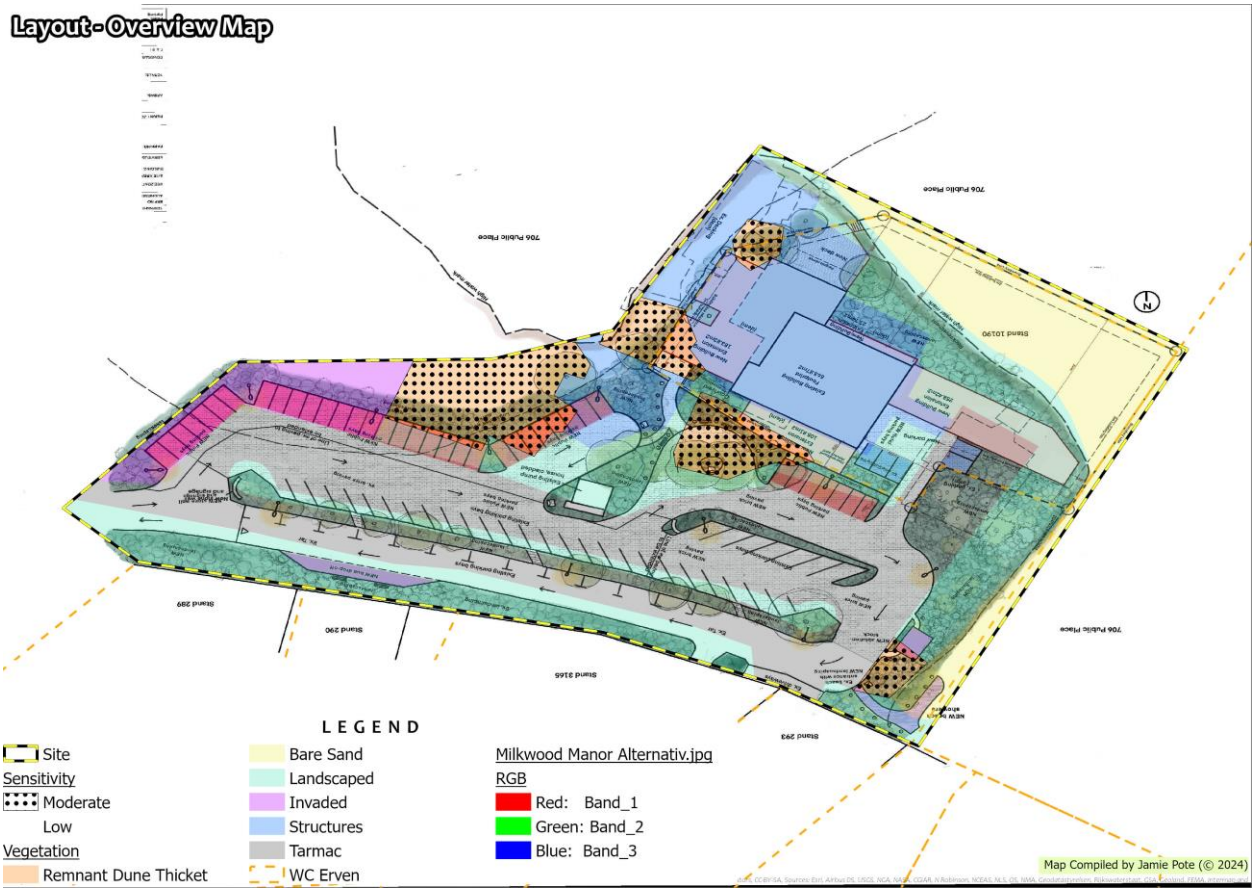

Figure 37: Vegetation Sensitivity with Alternative Site Development Plan (previous alternative layout).

Four stormwater discharge points have been identified and included in the design (Figure 38) All discharge points are existing (*Figure 39* to *Figure 42*) and will result in and upgrade and overall improvement to ecological functioning (or reduction in existing impact due to poor stormwater discharge points) compared to status quo.

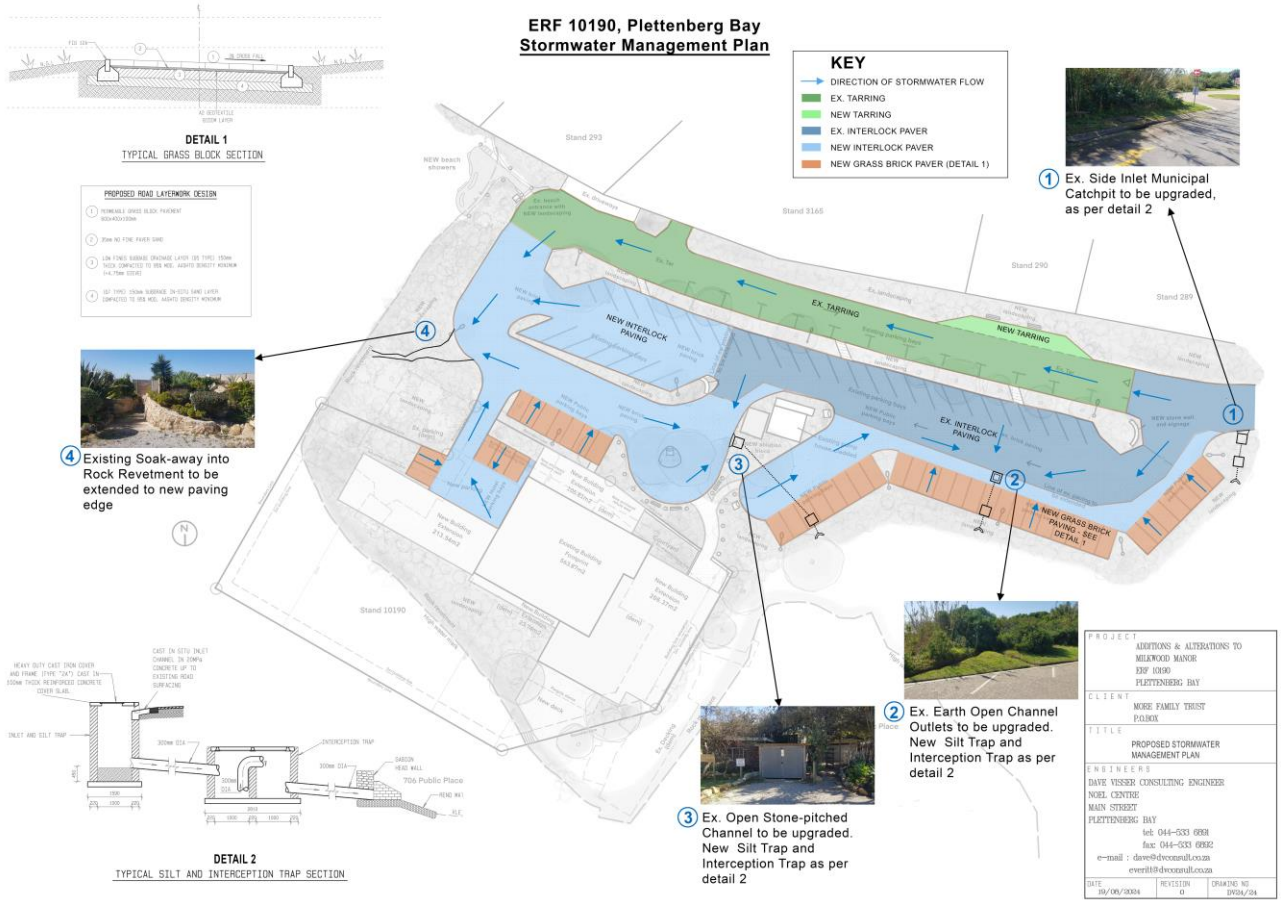

Figure 38: Proposed Stormwater discharge points.

Figure 39: Stormwater discharge point 1.

Figure 40: Stormwater discharge point 2.

Figure 41: Stormwater discharge point 3.

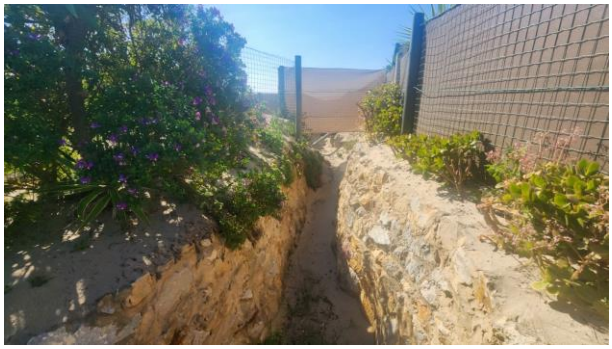

Figure 42: Stormwater discharge point 4.

3.3 Assessment of Risks and Impacts to Biodiversity

3.3.1 Criteria of assigning significance to potential impacts

The assessment criteria utilised in the Basic Assessment Report is based on, and adapted from, the Guideline on Impact Significance, Integrated Environmental Management Information Series 5 (Department of Environmental Affairs and Tourism (DEAT), 2002) and the Guideline 5: Assessment of Alternatives and Impacts in Support of the Environmental Impact Assessment Regulations (DEAT, 2006).

Subsequent to the initial public review period, comments relating to the proposed beach access and beach shower have resulted in the applicant having revised the layouts including the preferred and alternative layouts. The revised layouts as described above will result in no significant changes to the terrestrial biodiversity impacts as assessed below.

Determination of Extent (Scale):

Site specific	On site or within 100 m of the site boundary, but not beyond the property boundaries.
Local	The impacted area includes the whole or a measurable portion of the site and property, but could affect the area surrounding the development, including the neighbouring properties and wider municipal area.
Regional	The impact would affect the broader region (e.g., neighbouring towns) beyond the boundaries of the adjacent properties.
National	The impact would affect the whole country (if applicable).

Determination of Duration:

Temporary	The impact will be limited to the construction phase.
Short term	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than 8 months after the completion of the construction phase.
Medium term	The impact will last up to the end of the construction phase, where after it will be entirely negated in a period shorter than 3 years after the completion of construction activities.
Long term	The impact will continue for the entire operational lifetime of the development but will be mitigated by direct human action or by natural processes thereafter.
Permanent	This is the only class of impact that will be non-transitory. Such impacts are regarded to be irreversible, irrespective of what mitigation is applied.

Determination of Probability:

Improbable	The possibility of the impact occurring is very low, due either to the circumstances, design or experience.
Probable	There is a possibility that the impact will occur to the extent that provisions must therefore be made.

Highly probable	It is most likely that the impacts will occur at some stage of the development. Plans must be drawn up to mitigate the activity before the activity commences.
Definite	The impact will take place regardless of any prevention plans.

Determination of Significance (without mitigation):

No significance	The impact is not substantial and does not require any mitigation action.
Low	The impact is of little importance but may require limited mitigation.
Medium	The impact is of sufficient importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
Medium-High	The impact is of high importance and is therefore considered to have a negative impact. Mitigation is required to manage the negative impacts to acceptable levels.
High	The impact is of great importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.
Very High	The impact is critical. Mitigation measures cannot reduce the impact to acceptable levels. As such the impact renders the proposal unacceptable.

Determination of Significance (with mitigation):

No significance	The impact will be mitigated to the point where it is regarded to be insubstantial.
Low	The impact will be mitigated to the point where it is of limited importance.
Medium	Notwithstanding the successful implementation of the mitigation measures, the impact will remain of significance. However, taken within the overall context of the project, such a persistent impact does not constitute a fatal flaw.
High	Mitigation of the impact is not possible on a cost-effective basis. The impact continues to be of great importance, and taken within the overall context of the project, is considered to be a fatal flaw in the project proposal.

Determination of Reversibility:

Completely Reversible	The impact is reversible with implementation of minor mitigation measures
Partly Reversible	The impact is partly reversible but more intense mitigation measures
Barely Reversible	The impact is unlikely to be reversed even with intense mitigation measures
Irreversible	The impact is irreversible, and no mitigation measures exist

Determination of Degree to which an Impact can be Mitigated:

Can be mitigated	The impact is reversible with implementation of minor mitigation measures
Can be partly mitigated	The impact is partly reversible but more intense mitigation measures
Can be barely mitigated	The impact is unlikely to be reversed even with intense mitigation measures
Not able to mitigate	The impact is irreversible, and no mitigation measures exist

Determination of Loss of Resources:

No loss of resource	The impact will not result in the loss of any resources
Marginal loss of resource	The impact will result in marginal loss of resources
Significant loss of resources	The impact will result in significant loss of resources
Complete loss of resources	The impact will result in a complete loss of all resources

Determination of Cumulative Impact:

Negligible	The impact would result in negligible to no cumulative effects
Low	The impact would result in insignificant cumulative effects
Medium	The impact would result in minor cumulative effects

High	The impact would result in significant cumulative effects

Determination of Consequence significance:

Negligible	The impact would result in negligible to no consequences
Low	The impact would result in insignificant consequences
Medium	The impact would result in minor consequences
High	The impact would result in significant consequences

3.3.2 Assessment of Terrestrial Biodiversity Impacts

Operations can result in a range of negative impacts on terrestrial, marine and other aquatic ecosystems if not effectively managed. **Error! Reference source not found.** describes impacts that may potentially o ccur in the site (as per DEDEAT guidelines) as well indicating the relevant EMP section. The predicted significance of these during the construction and operational phases are summarised below

Construction Phase

ALTERNATIVE:	PREFERRED ALTERNATIVE A	ALTERNATIVE B	NO-GO ALTERNATIVE
TERRESTRIAL BIODIVERSITY ASSESSMENT IMPACT 1			
Potential impact and risk:	**PERMANENT OR TEMPORARY LOSS OF INDIGENOUS VEGETATION**		
Nature of impact:	Permanent or temporary loss of indigenous vegetation cover because of site clearing. Site clearing before construction will result in the blanket clearing of vegetation within the affected footprint.		**No Impact**
Extent and duration of impact:	• Local and limited to site • Short term (1-5 years)	• Local and limited to site • Short term (1-5 years)	
Consequence of impact or risk:	Loss of indigenous vegetation	Loss of indigenous vegetation	
Probability of occurrence:	Definite	Definite	
Degree to which the impact may cause irreplaceable loss of resources:	Low to very low	Low to very low	
Degree to which the impact can be reversed:	High	High	
Indirect impacts:	None identified.	None identified.	
Cumulative impact prior to mitigation:	None	None	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Low (-)**	**No Impact**
Degree to which the impact can be avoided:	Unavoidable	Unavoidable	
Degree to which the impact can be managed:	High	High	
Degree to which the impact can be mitigated:	High	High	
Proposed mitigation:	See below		
Residual impacts:	None	None	
Cumulative impact post mitigation:	None	None	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Very Low (-)**	**Very Low (-)**	**No Impact**

Mitigation measures to reduce residual risk or enhance opportunities:

- No clearing outside of development footprint to take place.
- Surrounding Dune Thicket and Estuarine habitat is to be conserved and not harmed during the construction process.

- Rehabilitation of vegetation of the site must be done as described in the Rehabilitation Plans.
- Trees and shrubs that are directly affected by the operations may be felled or cleared but only by the expressed written permission of the ECO.

ALTERNATIVE:	PREFERRED ALTERNATIVE A	ALTERNATIVE B	NO-GO ALTERNATIVE
TERRESTRIAL BIODIVERSITY ASSESSMENT IMPACT 2			
Potential impact and risk:	**LOSS OF FLORA SPECIES OF CONSERVATION**		
Nature of impact:	Loss of flora Species of Conservation Concern during pre-construction site clearing activities. Several special of concern are known from surrounding areas, which could be destroyed during site preparation, none of which were confirmed to be present.		**No Impact**
Extent and duration of impact:	• Local and limited to site • Short term (1-5 years)	• Local and limited to site • Short term (1-5 years)	
Consequence of impact or risk:	Loss of Flora SCC	Loss of Flora SCC	
Probability of occurrence:	Probable	Probable	
Degree to which the impact may cause irreplaceable loss of resources:	Low	Low	
Degree to which the impact can be reversed:	High	High	
Indirect impacts:	None identified.	None identified.	
Cumulative impact prior to mitigation:	None	None	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Low (-)**	**No Impact**
Degree to which the impact can be avoided:	High – No SCC found on site	High – No SCC found on site	
Degree to which the impact can be managed:	Manageable	Manageable	
Degree to which the impact can be mitigated:	Can be mitigated	Can be mitigated	
Proposed mitigation:	A flora search and rescue is unlikely to be required and no protected flora were found to be present within a natural context.		
Residual impacts:	None	None	
Cumulative impact post mitigation:	None	None	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Very Low (-)**	**Very Low (-)**	**No Impact**

Mitigation measures to reduce residual risk or enhance opportunities:

- Workers are NOT allowed to collect any flora species. All flora species remain the property of the landowner and must not be disturbed, upset or used without their expressed consent.

ALTERNATIVE:	PREFERRED ALTERNATIVE A	ALTERNATIVE B	NO-GO ALTERNATIVE
TERRESTRIAL BIODIVERSITY ASSESSMENT IMPACT 3			
POTENTIAL IMPACT AND RISK:	**ALIEN INVASIVE SPECIES**		
Nature of impact:	Susceptibility of post construction disturbed areas to invasion by exotic and alien invasive species and removal of exotic and alien invasive species during construction. Post construction disturbed areas having no vegetation cover are often susceptible to invasion by weedy and alien species, which can not only become		**NO IMPACT**

	invasive but also prevent natural flora from becoming established.		
Extent and duration of impact:	• Local and limited to site • Medium term (5-15 years)	• Local and limited to site • Medium term (5-15 years)	
Consequence of impact or risk:	ALIEN INFESTATION ON SITE	ALIEN INFESTATION ON SITE	
Probability of occurrence:	HIGH	HIGH	
Degree to which the impact may cause irreplaceable loss of resources:	LOW	LOW	
Degree to which the impact can be reversed:	HIGH	HIGH	
Indirect impacts:	NONE IDENTIFIED.	NONE IDENTIFIED.	
Cumulative impact prior to mitigation:	NONE	NONE	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**LOW (-)**	**LOW (-)**	**NO IMPACT**
Degree to which the impact can be avoided:	AVOIDABLE	AVOIDABLE	
Degree to which the impact can be managed:	HIGH	HIGH	
Degree to which the impact can be mitigated:	HIGH	HIGH	
Proposed mitigation:	A SUITABLE WEED MANAGEMENT STRATEGY MUST BE IMPLEMENTED IN THE CONSTRUCTION PHASE ANDCARRIED THROUGH THE OPERATIONAL PHASE.		
Residual impacts:	NONE	NONE	
Cumulative impact post mitigation:	NONE	NONE	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**VERY LOW (-)**	**VERY LOW (-)**	**NO IMPACT**

Mitigation measures to reduce residual risk or enhance opportunities:

- Alien species must be removed from the site as per the National Environmental Management: Biodiversity Act (No. 10 of 2004) requirements.
- The Contractor is responsible for the removal of alien species within all areas disturbed during construction activities. Disturbed areas include (but are not limited to) access roads, construction camps, site areas and temporary storage areas.
- In consultation with relevant authorities, the Engineer may order the removal of alien plants (when necessary). Areas within the confines of the site are to be included.
- All alien plant material (including brushwood and seeds) should be removed from site and disposed of at a registered waste disposal site. Should brushwood be utilised for soil stabilization or mulching, it must be seed free.
- After clearing is completed, an appropriate cover crop may be required, should natural re-establishment of grasses not take place in a timely

ALTERNATIVE:	**PREFERRED ALTERNATIVE A**	**ALTERNATIVE B**	**NO-GO ALTERNATIVE**
	TERRESTRIAL BIODIVERSITY ASSESSMENT IMPACT 4		
Potential impact and risk:	**EROSION**		
Nature of impact:	Susceptibility of some areas to erosion because of construction related disturbances. Removal of vegetation cover and soil disturbance may result in some areas being susceptible to soil erosion after completion of the activity.		**No Impact**

Extent and duration of impact:	• Local and limited to site • Medium term (5-15 years)	• Local and limited to site • Medium term (5-15 years)	
Consequence of impact or risk:	Increased erosion on site	Increased erosion on site	
Probability of occurrence:	Probable	Probable	
Degree to which the impact may cause irreplaceable loss of resources:	Very low	Very low	
Degree to which the impact can be reversed:	Reversible	Reversible	
Indirect impacts:	None identified.	None identified.	
Cumulative impact prior to mitigation:	None	None	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Low (-)**	**No Impact**
Degree to which the impact can be avoided:	Avoidable	Avoidable	
Degree to which the impact can be managed:	High	High	
Degree to which the impact can be mitigated:	High	High	
Proposed mitigation:	See below		
Residual impacts:	None	None	
Cumulative impact post mitigation:	None	None	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Very Low (-)**	**Very Low (-)**	**No Impact**

Mitigation measures to reduce residual risk or enhance opportunities:

- Suitable measures must be implemented in areas that are susceptible to erosion, including the stormwater structures around the parking areas as well as where mobile dune sands are present. Areas must be rehabilitated, and a suitable cover crop planted and/or other structures constructed.
- If natural vegetation re-establishment does not occur, a suitable grass must be applied on non-sand areas.
- Stormwater Management Plans must be developed for the site and should include: the management of stormwater during construction, the installation of stormwater and erosion control infrastructure, the management of infrastructure after completion of construction.
- Temporary drainage works may be required to prevent stormwater to prevent silt laden surface water from draining into the estuary in proximity to the site. Stormwater must be prevented from entering or running off in an unmanaged manner.
- To ensure that site is not subjected to excessive erosion and capable of drainage runoff with minimum risk of scour, their slopes should be profiled at a maximum 1:3 gradient.
- Diversion channels should be constructed ahead of the open cuts, and above emplacement areas and stockpiles to intercept clean runoff and divert it around disturbed areas into the natural drainage system downstream of the site.
- Existing vegetation must be retained as far as possible to minimise erosion problems.
- It is importation that the rehabilitation of site is planned and completed in such a way that the runoff water will not cause erosion.
- Sediment-laden runoff from cleared areas must be prevented from entering the estuary.
- No estuary or surface water may be affected by silt emanating from the site.

ALTERNATIVE:	PREFERRED ALTERNATIVE A	ALTERNATIVE B	NO-GO ALTERNATIVE
TERRESTRIAL BIODIVERSITY ASSESSMENT IMPACT 5			
Potential impact and risk:	**ECOLOGICAL, AQUATIC, ESTUARINE AND RIPARIAN PROCESSES**		
Nature of impact:	Activity may result in disturbances to ecological processes. No Aquatic, estuarine and riparian processes will be affected.		**No Impact**
Extent and duration of impact:	• Local and limited to site • Very short to short term (0-5 years)	• Local and limited to site • Very short to short term (0-5 years)	
Consequence of impact or risk:	Disturbance to ecological, aquatic and riparian processes.	Disturbance to ecological, aquatic and riparian processes.	
Probability of occurrence:	Probable	Probable	
Degree to which the impact may cause irreplaceable loss of resources:	Very low	Very low	
Degree to which the impact can be reversed:	Reversible	Reversible	
Indirect impacts:	None identified.	None identified.	
Cumulative impact prior to mitigation:	None	None	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Low (-)**	**No Impact**
Degree to which the impact can be avoided:	Avoidable	Avoidable	
Degree to which the impact can be managed:	High	High	
Degree to which the impact can be mitigated:	High	High	
Proposed mitigation:	• Adequate measures to be implemented for erosion and stormwater management from the site and parking areas into the adjacent estuary (see Terrestrial Impact 4 proposed mitigation measures)		
Residual impacts:	None	None	
Cumulative impact post mitigation:	None	None	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Very Low (-)**	**Very Low (-)**	**No Impact**

ALTERNATIVE:	PREFERRED ALTERNATIVE A	ALTERNATIVE B	NO-GO ALTERNATIVE
TERRESTRIAL BIODIVERSITY ASSESSMENT IMPACT 6			
Potential impact and risk:	**FAUNAL SPECIES, HABITAT AND PROCESSES**		
Nature of impact:	Loss of faunal SCC due to construction activities: Activities associated with bush clearing, killing of perceived dangerous fauna, may lead to increased mortalities among faunal species. Loss of Faunal Habitat: Activity may result in the loss of habitat for faunal species, which could result in disturbance and displacement of faunal species. Impacts to faunal processes because of the activity.		**No Impact**
Extent and duration of impact:	• Local and limited to site • Very short term (0-1 years)	• Local and limited to site • Very short term (0-1 years)	

Consequence of impact or risk:	Loss of faunal SCC, loss of faunal habitat and disturbance to faunal processes.	Loss of faunal SCC, loss of faunal habitat and disturbance to faunal processes.	
Probability of occurrence:	Loss of faunal SCC: Probable Loss of faunal habitat: Definite Disturbance to faunal processes: Probable	Loss of faunal SCC: Probable Loss of faunal habitat: Definite Disturbance to faunal processes: Probable	
Degree to which the impact may cause irreplaceable loss of resources:	Low	Low	
Degree to which the impact can be reversed:	Reversible	Reversible	
Indirect impacts:	None identified.	None identified.	
Cumulative impact prior to mitigation:	None	None	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Low (-)**	**No Impact**
Degree to which the impact can be avoided:	Medium to High	Medium to High	
Degree to which the impact can be managed:	High	High	
Degree to which the impact can be mitigated:	High	High	
Proposed mitigation:	See below		
Residual impacts:	None	None	
Cumulative impact post mitigation:	None	None	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Very Low (-)**	**Very Low (-)**	**No Impact**

Mitigation measures to reduce residual risk or enhance opportunities:

- The habitats and microhabitats present on the project site are not unique and are widespread in the general area, hence the local impact associated with the footprint would be of low significance if mitigation measures are adhered to.
- Small mammals within the habitat on and around the affected area are generally mobile and likely to be transient to the area. The risk of species of special concern is low, and it is unlikely that there will be any impact to populations of such species because of the activity.
- A faunal search and rescue is unlikely to be required and no protected species are likely to be affected.
- No animals are to be harmed or killed during the course of operations.
- No snares or harming of any faunal species permitted.

Operational Phase Impacts

ALTERNATIVE:	PREFERRED ALTERNATIVE A	ALTERNATIVE B	NO-GO ALTERNATIVE
TERRESTRIAL BIODIVERSITY ASSESSMENT IMPACT 7			
Potential impact and risk:	**ALIEN INVASIVE SPECIES**		
Nature of impact:	Susceptibility of post construction disturbed areas to invasion by exotic and alien invasive species and removal of exotic and alien invasive species during construction. Post		**No Impact**

	construction disturbed areas having no vegetation cover are often susceptible to invasion by weedy and alien species, which can not only become invasive but also prevent natural flora from becoming established.		
Extent and duration of impact:	• Local and limited to site • Medium term (5-15 years)	• Local and limited to site • Medium term (5-15 years)	
Consequence of impact or risk:	Alien infestation on site	Alien infestation on site	
Probability of occurrence:	High	High	
Degree to which the impact may cause irreplaceable loss of resources:	Low	Low	
Degree to which the impact can be reversed:	High	High	
Indirect impacts:	None identified.	None identified.	
Cumulative impact prior to mitigation:	None	None	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Low (-)**	**No Impact**
Degree to which the impact can be avoided:	Avoidable	Avoidable	
Degree to which the impact can be managed:	High	High	
Degree to which the impact can be mitigated:	High	High	
Proposed mitigation:	See below		
Residual impacts:	None	None	
Cumulative impact post mitigation:	None	None	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Very Low (-)**	**Very Low (-)**	**No Impact**

Mitigation measures to reduce residual risk or enhance opportunities:

- After construction is completed, an appropriate cover may be required, should natural re-establishment of natural vegetation not take place in a timely manner.
- A suitable weed management strategy to be implemented in and around the site post construction, which is likely to result in proliferation of weeds in disturbed areas on completion.

ALTERNATIVE:	PREFERRED ALTERNATIVE A	ALTERNATIVE B	NO-GO ALTERNATIVE
TERRESTRIAL BIODIVERSITY ASSESSMENT IMPACT 8			
Potential impact and risk:	**EROSION**		
Nature of impact:	Removal of vegetation cover and soil disturbance may result in some areas being susceptible to soil erosion after completion of the activity.		**No Impact**
Extent and duration of impact:	• Local and limited to site • Medium term (5-15 years)	• Local and limited to site • Medium term (5-15 years)	
Consequence of impact or risk:	Increased erosion on site	Increased erosion on site	
Probability of occurrence:	Probable	Probable	

Degree to which the impact may cause irreplaceable loss of resources:	Very low	Very low	
Degree to which the impact can be reversed:	Reversible	Reversible	
Indirect impacts:	None identified.	None identified.	
Cumulative impact prior to mitigation:	None	None	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Low (-)**	**No Impact**
Degree to which the impact can be avoided:	Avoidable	Avoidable	
Degree to which the impact can be managed:	High	High	
Degree to which the impact can be mitigated:	High	High	
Proposed mitigation:	• Suitable measures must be implemented in areas that are susceptible to erosion, including the stormwater structures around the parking areas as well as where mobile dune sands are present. Areas must be rehabilitated, and a suitable cover crop planted and/or other structures constructed. • If natural vegetation re-establishment does not occur, a suitable grass must be applied on non-sand areas.		
Residual impacts:	None	None	
Cumulative impact post mitigation:	None	None	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Very Low (-)**	**Very Low (-)**	**No Impact**

Mitigation measures to reduce residual risk or enhance opportunities:

- Rehabilitation is necessary to control erosion and sedimentation of all eroded areas (where works will take place).
- Areas where construction is completed should be rehabilitated immediately.
- Areas to be disturbed in future activities will be kept as small as possible (i.e. conducting the operations in phases), thereby limiting the scale of erosion.
- Slopes will be profiled to ensure that they are not subjected to excessive erosion but capable of drainage runoff with minimum risk of scour (maximum 1:3 gradient).
- Existing vegetation will be retained as far as possible to minimize erosion problems.

ALTERNATIVE:	PREFERRED ALTERNATIVE A	ALTERNATIVE B	NO-GO ALTERNATIVE
TERRESTRIAL BIODIVERSITY ASSESSMENT IMPACT 9			
Potential impact and risk:	**ECOLOGICAL, AQUATIC AND RIPARIAN PROCESSES**		
Nature of impact:	Activity may result in disturbances to ecological processes. No Aquatic and riparian processes will be affected.		**No Impact**
Extent and duration of impact:	• Local and limited to site • Very short to short term (0-5 years)	• Local and limited to site • Very short to short term (0-5 years)	

Consequence of impact or risk:	Disturbance to ecological, aquatic and riparian processes.	Disturbance to ecological, aquatic and riparian processes.	
Probability of occurrence:	Probable	Probable	
Degree to which the impact may cause irreplaceable loss of resources:	Very low	Very low	
Degree to which the impact can be reversed:	Reversible	Reversible	
Indirect impacts:	None identified.	None identified.	
Cumulative impact prior to mitigation:	None	None	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Low (-)**	**No Impact**
Degree to which the impact can be avoided:	Avoidable	Avoidable	
Degree to which the impact can be managed:	High	High	
Degree to which the impact can be mitigated:	High	High	
Proposed mitigation:	• Adequate measures to be implemented for erosion and stormwater management from the site and parking areas into the adjacent estuary.		
Residual impacts:	None	None	
Cumulative impact post mitigation:	None	None	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Very Low (-)**	**Very Low (-)**	**No Impact**

3.3.3 Potential Terrestrial Biodiversity Impacts (Cumulative)

No cumulative impacts are expected because of the development of the site providing recommendation and mitigation measures are adhered to, due to the limited disturbance area.

3.3.4 Terrestrial Biodiversity Impact Reversibility

In general, most impacts will have a high reversibility in the affected habitat, as well as transformed or degraded areas, except where hardening of surfaces or removal of topsoil may occur.

3.3.5 Impacts and Risks to Irreplaceable Biodiversity Resources

Risks to Irreplaceable Biodiversity Resources is low to very low.

3.3.6 Residual Risks and Uncertainties

No residual risks or uncertainties are anticipated.

3.4 Findings, Outcomes and Recommendations

3.4.1 Summary of Findings

- The vegetation on site is generally transformed and comprising a landscaped garden with some remnant dune thicket elements, including several milkwood trees as some associated remnant dune thicket elements. A small pocket of dune thicket is also present at the parking beach access point.

- No Sensitive plant or Animal species identified as per the National Environmental Screening Tool were found to be present or likely to be present. Several Cycads are present but are introduced for landscape garden purposes and are not in a natural context.
- Although areas are designated CBA 1 & Protected Area, these designations are incorrect as the site is significantly transformed, being a developed erf on the edge of an urban area.
- Most of the site is considered to have a LOW Sensitivity due to the disturbed and transformed nature.
- A few minor MODERATE sensitivity patches are designated where Milkwood trees and/or remnant dune thicket is present, which largely has negligible ecological value.
- No HIGH sensitivity areas are identified within the terrestrial environment, but the estuarine and dune environment are outside the context of this assessment and report.
- No No-go areas are identified within the site footprint.
- No significant direct, indirect or cumulative impacts are anticipated.
- Subsequent to the initial public review period, comments relating to the proposed beach access and beach shower have resulted in the applicant having revised the layouts including the preferred and alternative layouts. The revised layouts as described above will result in no significant changes to the terrestrial biodiversity impacts, neither direct, indirect nor cumulative. No changes to recommended mitigation measures are required as a result of the layout changes.

3.4.2 Recommendations & Mitigation Measures

- The proposed activity is unlikely to pose any significant risk to natural ecological processes, vegetarian or plant and animal species of conservation concern.
- Several Cycads and other typically PNCO protected species are present within the site, however these are within landscaped gardens and sourced from local nurseries.
- Several Milkwood trees are present as remnants within the Erf. None should be removed, cut or pruned without necessary NFA permits in place.
- PNCO (Provincial Nature Conservation Ordinance) permits are not likely to be required for any naturally occurring indigenous species.

Table 8 lists specific mitigation measures that must be implemented and adhered to. These must be considered to be conditions of authorisation.

Table 8: Specific Mitigation Measures and Recommendations

IMPACT	MITIGATION MEASURES
Vegetation	• No clearing outside of development footprint to take place. • Surrounding Dune Thicket and Estuarine habitat is to be conserved and not harmed during the construction process.
Flora Species	• A flora search and rescue is unlikely to be required and no protected flora were found to be present within a natural context.
Alien Invasive Species	• A suitable weed management strategy to be implemented in and around the site post construction, which is likely to result in proliferation of weeds in disturbed areas on completion.
Erosion	• Suitable measures must be implemented in areas that are susceptible to erosion, including the stormwater structures around the parking areas as well as where mobile dune sands are present. Areas must be rehabilitated, and a suitable cover crop planted and/or other structures constructed. • If natural vegetation re-establishment does not occur, a suitable grass must be applied on non-sand areas.
Aquatic and Riparian processes	• Adequate measures to be implemented for erosion and stormwater management from the site and parking areas into the adjacent estuary.

IMPACT	MITIGATION MEASURES
Fauna	• Small mammals within the habitat on and around the affected area are generally mobile and likely to be transient to the area. The risk of species of special concern is low, and it is unlikely that there will be any impact to populations of such species because of the activity. • A faunal search and rescue is unlikely to be required and no protected species are likely to be affected. • No animals are to be harmed or killed during the course of operations.

3.5 Site Preparation and Vegetation Clearing Plan

No flora relocation is likely to be required before commencement, and permits are unlikely to be required as long as no Cycads are disturbed and/or removed and no Milkwood trees are removed, cut or pruned., but based on the layouts provided it is likely that some Milkwood trees will require as a minimum pruning.

No fauna relocation is likely to be required before commencement, and permits were unlikely to be required, but recommended as a precautionary measure for any small rodents and reptiles that may occur in the rocky areas.

3.6 Open Space Management/Conservation Plan

None are applicable for this project.

3.7 Maintenance Management Plan

Ongoing maintenance is likely to be required in the long-term, which could include ongoing stabilisation measures on the dune and estuary sides. All measures of this report, including the EMPr should be adhered for any maintenance requirements. Any excavated areas must be stabilised and rehabilitated as per the measures indicated in this report.

4 Organizational Capacity and Competency

Successful Implementation will be in part be dependent on the organisational capacity and competency of the applicant and any implementing agents. The following aspects are likely to pose risk to the successful mitigation of the project:

- Budget constraints – budget allocated for environmental management tends to be inadequate for construction projects.
- Organisational Structure – implementing agents may or may not have adequate capacity and competency to ensure appropriate and adequate environmental management.

5 Emergency Preparedness and Response

Emergency Preparedness Plan must be included in the EMPr and should address specific measures relating to the following emergency risks:

- Fire management and response.
- Spill management and incident response.
- Waste management and incident response.
- Response to emergency site shutdown, including labour and protest actions.

6 Stakeholder Engagement

Possible Stakeholders relating to Biodiversity could include the following key groups:

- Neighbouring Property Owners
- Local Regional and National Conservation Authorities

No Stakeholder Engagement was conducted specifically by the Specialist. Stakeholder Engagement will be undertaken by the EAP as part of the environment application public participatory process. Any comments raised relating to Biodiversity will be addressed by the specialist in the final report.

7 Monitoring and Review

Key monitoring activities should include the following:

1. Pre-construction
   a) Ensure flora permits are in place timeously (PNCO only) – allow at least 1 or 2 months before commencement.
   b) Environmental Awareness and training (EAT) – Ensure all labour are informed and plant operators are aware of risks, issues, do's and don'ts and no-go areas.
2. Bush clearing
   a) Ensure working plant has no oil or hydraulic leaks
   b) Check delineated footprints area not exceeded.
3. Construction
   a) Regular checks on trenches for trapped animals and possible drowning risks
   b) Regular checks of fences for snares
4. Rehabilitation
   a) Check quality of topsoil and weed free.
   b) Check for weed regrowth and manage timeously (before seed is set)
5. Operation monitoring
   a) Weed management on ongoing basis.
   b) Erosion to be addressed on ongoing basis

8 Appendices

8.1 Appendix A: References

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8.2 Appendix B: Abbreviations & Glossary

8.2.1 Abbreviations

CARA	Conservation of Agricultural Resources Act, Act 43 of 1983
CBA	Critical Biodiversity Area
DEA	Department of Environmental Affairs (*now DFFE, see below*)
DEDEAT	Department of Economic Development, Environmental Affairs and Tourism
DFFE	The Department of Environmental Affairs was renamed the Department of Forestry, Fisheries & the Environment (DFFE) in April 2021, incorporating the forestry and fisheries functions from the previous Department of Agriculture, Forestry and Fisheries.
DEMC	Desired Ecological Management Class
DWS	Department of Water Affairs and Sanitation
DWAF	Department of Water Affairs and Forestry (former department name)
EA	Environmental Authorisation
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMC	Ecological Management Class
EMP	Environmental Management Plan
EMPr	Environmental Management Programme report
ER	Environmental Representative
ESS	Ecosystem Services
IAP's	Interested and Affected Parties
IEM	Integrated Environmental Management
LM	Local Municipality
masl	meters above sea level
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act, Act 107 of 1998
NFA	National Forests Act
NEM:BA	National Environmental Management: Biodiversity Act 10 of 2004
NFA	National Forest Act, Act 84 of 1998
PEMC	Present Ecological Management Class
PES	Present Ecological State
PNCO	Provincial Nature and Environment Conservation Ordinance (No. 19 of 1974).
RDL	Red Data List
RHS	Right Hand Side
RoD	Record of Decision
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
SoER	State of the Environment Report
SSC	Species of Special Concern
ToPS	Threatened of Protected Species
ToR	Terms of Reference
+ve	Positive
-ve	Negative

8.2.2 Glossary

Alien Invasive Species (AIS)	An alien species whose introduction and/or spread threaten biological diversity (Convention on Biological Diversity). Note: "*Alien invasive species*" is considered to be equivalent to "*invasive alien species*". An alien species which becomes established in natural or semi-natural ecosystems or habitat, is an agent of change, and threatens native biological diversity (*IUCN*).
Best Environmental Practice	The application of the most appropriate combination of environmental control measures and strategies (Stockholm Convention).
Best Management Practice	Established techniques or methodologies that, through experience and research, have proven to lead to a desired result (BBOP).
Biodiversity	Biological diversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems.
Biodiversity Offset	Measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure and ecosystem function and people's use and cultural values associated with biodiversity (BBOP).
Bioremediation	The use of organisms such as plants or microorganisms to aid in removing hazardous substances from an area. Any process that uses microorganisms, fungi, green plants, or their enzymes to return the natural environment altered by contaminants to its original condition.
Boundary	Landscape patches have a boundary between them which can be defined or fuzzy (Sanderson and Harris, 2000). The zone composed of the edges of adjacent ecosystems is the boundary.
Catchment	In relation to a watercourse or watercourses or part of a watercourse, means the area from which any rainfall will drain into the watercourse or watercourses or part of a watercourse, through surface flow to a common point or common points.
Connectivity	The measure of how connected or spatially continuous a corridor, network, or matrix is. For example, a forested landscape (the matrix) with fewer gaps in forest cover (open patches) will have higher connectivity.
Corridors	Have important functions as strips of a landscape differing from adjacent land on both sides. Habitat, ecosystems or undeveloped areas that physically connect habitat patches. Smaller, intervening patches of surviving habitat can also serve as "steppingstones" that link fragmented ecosystems by ensuring that certain ecological processes are maintained within and between groups of habitat fragments.
Critically Endangered (CR)	A category on the IUCN Red List of Threatened Species which indicates a taxon is considered to be facing an extremely high risk of extinction in the wild (*IUCN*).
Cultural Ecosystem Services	The non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experience, including, e.g. knowledge systems, social relations, and aesthetic values (Millennium Ecosystem Assessment).
Cumulative Impacts	The total impact arising from the project (under the control of the developer), other activities (that may be under the control of others, including other developers, local communities, government) and other background pressures

	and trends which may be unregulated. The project's impact is therefore one part of the total cumulative impact on the environment. The analysis of a project's incremental impacts combined with the effects of other projects can often give a more accurate understanding of the likely results of the project's presence than just considering its impacts in isolation (BBOP).
Data Deficient (DD)	A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat(*IUCN*).
Degraded Habitat/Land	Land that has been impacted upon by human activities (including introduction of invasive alien plants, light to moderate overgrazing, accelerated soil erosion, dumping of waste), but still retains a degree of its original structure and species composition (although some species loss would have occurred) and where ecological processes still occur (albeit in an altered way). Degraded land is capable of being restored to a near-natural state with appropriate ecological management.
Disturbance	An event that significantly alters the pattern of variation in the structure or function of a system, while fragmentation is the breaking up of a habitat, ecosystem, or land-use type into smaller parcels. Disturbance is generally considered a natural process.
Ecological Function	How each of the elements in the landscape interacts based on its life cycle events [Producers, Consumers, Decomposers Transformers]. Includes the capacity of natural processes and components to provide goods and services that satisfy human needs, either directly or indirectly.
Ecological Pattern	The contents and internal order of the landscape, or its spatial (and temporal) components. May be homogenous or heterogenous. Result from the ecological processes that produce them.
Ecological Process	Includes *Physical processes* [Climate (precipitation, insolation), hydrology, geomorphology]; *Biological processes* [Photosynthesis, respiration, reproduction]; *Ecological processes* [Competition, predator-prey interactions, environmental gradients, life histories]
Ecological Processes	Ecological processes typically only function well where natural vegetation remains, and where the remaining vegetation is well-connected with other nearby patches of natural vegetation. Loss and fragmentation of natural habitat severely threatens the integrity of ecological processes. Where basic processes are intact, ecosystems are likely to recover more easily from disturbances or inappropriate actions if the actions themselves are not permanent. Conversely, the more interference there has been with basic processes, the greater the severity (and longevity) of effects. Natural processes are complex and interdependent, and it is not possible to predict all the consequences of loss of biodiversity or ecosystem integrity. When a region's natural or historic level of diversity and integrity is maintained, higher levels of system productivity are supported in the long run and the overall effects of disturbances may be dampened.
Ecological Structure	The composition, or configuration, and the proportion of different patches across the landscape. Relates to species diversity, the greater the diversity, the more complex the structure. A description of the organisms and physical features of environment including nutrients and climatic conditions.
Ecosystem	All the organisms of a habitat, such as a lake or forest, together with the physical environment in which they live. A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

Ecosystem Services	A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit. Supporting Ecosystem services are those that are necessary for the maintenance of all other ecosystem services. Some examples include biomass production, production of atmospheric oxygen, soil formation and retention, nutrient cycling, water cycling, and provisioning of habitat.
Ecosystem Status	Ecosystem status of terrestrial ecosystems is based on the degree of habitat loss that has occurred in each ecosystem, relative to two thresholds: one for maintaining healthy ecosystem functioning, and one for conserving the majority of species associated with the ecosystem. As natural habitat is lost in an ecosystem, its functioning is increasingly compromised, leading eventually to the collapse of the ecosystem and to loss of species associated with that ecosystem (Millennium Ecosystem Assessment).
Ecotone	The transitional zone between two communities. Ecotones can arise naturally, such as a lakeshore, or can be human created, such as a cleared agricultural field from a forest. The ecotonal community retains characteristics of each bordering community and often contains species not found in the adjacent communities. Classic examples of ecotones include fencerows; forest to marshlands transitions; forest to grassland transitions; or land-water interfaces such as riparian zones in forests. Characteristics of ecotones include vegetational sharpness, physiognomic change, and occurrence of a spatial community mosaic, many exotic species, ecotonal species, spatial mass effect, and species richness higher or lower than either side of the ecotone.
Edge	The portion of an ecosystem near its perimeter, where influences of the adjacent patches can cause an environmental difference between the interior of the patch and its edge. This edge effect includes a distinctive species composition or abundance in the outer part of the landscape patch. For example, when a landscape is a mosaic of perceptibly different types, such as a forest adjacent to a grassland, the edge is the location where the two types adjoin. In a continuous landscape, such as a forest giving way to open woodland, the exact edge location is fuzzy and is sometimes determined by a local gradient exceeding a threshold, as an example, the point where the tree cover falls below thirty-five percent.
Emergent Tree	Trees that grow above the top of the canopy
Endangered (En)	Endangered terrestrial ecosystems have lost significant amounts (more than 60 % lost) of their original natural habitat, so their functioning is compromised. A taxon (species) is Endangered when the best available evidence indicates that it meets any of the criteria for Endangered, and it is therefore considered to be facing a very high risk of extinction in the wild (*IUCN*).
Endemic	A plant or animal species, or a vegetation type, which is naturally restricted to a defined region or limited geographical area. Many endemic species have widespread distributions and are common and thus are not considered to be under any threat. They are however noted to be unique to a region, which can include South Africa, a specific province or a bioregion, vegetation type, or a localised area. In cases where it is highly localised or known only from a few or a few localities, and is under threat, it may be red listed either in terms of the South Africa Threatened Species Programme, NEMBA Threatened or Protected Species (ToPS) or the IUCN Red List of Threated Species.
Environment	The external circumstances, conditions and objects that affect the existence and development of an individual, organism or group. These circumstances include biophysical, social, economic, historical and cultural aspects.
Estuary	a partially or fully enclosed body of water - (a) which is open to the sea permanently or periodically; and

	(b) within which the sea water can be diluted, to an extent that is measurable, with fresh water drained from land.
Evolutionary Processes	The process by which genetic changes have taken place and continue to take place in populations of plants and animals over successive generations in response to environmental changes. Evolutionary Processes includes the mechanisms that produce the biodiversity of life and include Mutation and Migration (Gene Flow), Genetic Drift, Natural Selection, Common Descent, Speciation, Sexual Selection, and Biogeography. Disruptions to evolutionary processes can prevent ecosystems and species from adapting to environmental change over time. Significant fragmentation is considered to be an important disrupter of evolutionary processes. Series of actions which enable new species to evolve in response to changing Biodiversity is maintained by ecological processes at the micro-scale (such as in pollination and nutrient cycling via microbial action) through to the mega-scale (natural events e.g. fire, flood; migration of species along river valleys or coastal areas, quality and quantity of water feeding rivers and estuaries; marine sand movement and the seasonal mountain-to-coast migration of birds that pollinate plants).
Exotic	Non-indigenous; introduced from elsewhere, may also be a *weed* or alien *invasive* species. Exotic species may be invasive or non-invasive.
Fragmentation (Habitat Fragmentation)	The 'breaking apart' of continuous habitat into distinct pieces. Causes land transformation, an important current process in landscapes as more and more development occurs.
Habitat	The home of a plant or animal species. Generally, those features of an area inhabited by animal or plant which are essential to its survival.
Habitat Banking	A market where credits from actions with beneficial biodiversity outcomes can be purchased to offset the debit from environmental damage. Credits can be produced in advance of, and without ex-ante links to, the debits they compensate for, and stored over time (IEEP).
IFC PS6	International Finance Corporation Performance Standard 6 – A standard guiding biodiversity conservation and sustainable management of living natural resources for projects financed by the International Finance Corporation (IFC)
Indicator	Information based on measured data used to represent an attribute, characteristic, or property of a system.
Indicator species	A species whose status provides information on the overall condition of the ecosystem and of other species in that ecosystem. They reflect the quality and changes in environmental conditions as well as aspects of community composition.
Indigenous	Native; occurring naturally in a defined area.
Indigenous Species (Native species)	A species that has been observed in the form of a naturally occurring and self-sustaining population in historical times (*Bern Convention 1979*). A species or lower taxon living within its natural range (past or present) including the area which it can reach and occupy using its natural dispersal systems (*modified after the Convention on Biological Diversity*)
Indirect Impact	Impacts triggered in response to the presence of a project, rather than being directly caused by the project's own operations (BBOP)
Instream habitat	Includes the physical structure of a watercourse and the associated vegetation in relation to the bed of the watercourse;
Intact Habitat / Vegetation	Land that has not been significantly impacted upon by man's activities. These are ecosystems that are in a near-pristine condition in terms of structure, species composition and functioning of ecological processes.
Intrinsic Value	The inherent worth of something, independent of its value to anyone or anything else.

Keystone Species	Species whose influence on ecosystem function and diversity are disproportionate to their numerical abundance. Although all species interact, the interactions of some species are more profound and far-reaching than others, such that their elimination from an ecosystem often triggers cascades of direct and indirect changes on more than a single trophic level, leading eventually to losses of habitats and extirpation of other species in the food web.
Landscape	An area of land that contains a mosaic of ecosystems, including human-dominated ecosystems (Millennium Ecosystem Assessment).
Landscape Approach	Dealing with large-scale processes in an integrated and multidisciplinary manner, combining natural resources management with environmental and livelihood considerations (FAO).
Landscape connectivity	The degree to which the landscape facilitates or impedes movement among resource patches.
Least threatened / Least Concern (LC)	These ecosystems have lost only a small proportion (more than 80 % remains) of their original natural habitat and are largely intact (although they may be degraded to varying degrees, for example by invasive alien species, overgrazing, or overharvesting from the wild). A taxon (species) is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category (*IUCN*).
Matrix	The "*background ecological system*" of a landscape with a high degree of connectivity.
Natural Forest (Indigenous Forest)	The definition of "*natural forest*" in the National Forests Act of 1998 (NFA) Section 2(1)(xx) is as follows: 'A natural forest means a group of indigenous trees. • whose crowns are largely contiguous. • or which have been declared by the Minister to be a natural forest under section 7(2)? This definition should be read in conjunction with Section 2(1)(x) which states that 'Forest' includes: • A natural forest, a woodland, and a plantation • The forest-produce in it; and • The ecosystems which it makes up. The legal definition must be supported by a technical definition, as demonstrated by a court case in the Umzimkulu magisterial district, relating to the illegal felling of Yellowwood (Podocarpus latifolius) and other species in the Gonqogonqo forest. From scientific definitions (also see Appendix B) we can define natural forest as: • A generally multi-layered vegetation unit • Dominated by trees that are largely evergreen or semi-deciduous. • The combined tree strata have overlapping crowns, and crown cover is >75% • Grasses in the herbaceous stratum (if present) are generally rare. • Fire does not normally play a major role in forest function and dynamics except at the fringes. • The species of all plant growth forms must be typical of natural forest (check for indicator species) • The forest must be one of the national forest types
Near Threatened (NT)	A taxon (species) is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable

	now, but is close to qualifying for or is likely to qualify for a threatened category in the near future (*IUCN*).
Patch	A term fundamental to landscape ecology, is defined as a relatively homogeneous area that differs from its surroundings. Patches are the basic unit of the landscape that change and fluctuate, a process called patch dynamics. Patches have a definite shape and spatial configuration and can be described compositionally by internal variables such as number of trees, number of tree species, height of trees, or other similar measurements.
Protected Area	A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.
Range restricted species	Species with a geographically restricted area of distribution. Note: Within the IFC PS6, restricted range refers to a limited extent of occurrence (EOO): • For terrestrial vertebrates and plants, restricted-range species are defined as those species that have an EOO less than 50,000 square kilometres (km2).
Refugia	A location which supports an isolated or relict population of a once more widespread species. This isolation can be due to climatic changes, geography, or human activities such as deforestation and overhunting.
Rehabilitation	Measures taken to rehabilitate degraded ecosystems or restore cleared ecosystems following exposure to impacts that cannot be completely avoided and/ or minimised. Rehabilitation emphasizes the reparation of ecosystem processes, productivity and services, whereas the goals of restoration also include the re-establishment of the pre-existing biotic integrity in terms of species composition and community structure (BBOP).
Resilience	The capacity of a natural system to recover from disturbance (OECD).
Restoration	The process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. An ecosystem has recovered when it contains sufficient biotic and abiotic resources to continue its development without further assistance or subsidy. It would sustain itself structurally and functionally, demonstrate resilience to normal ranges of environmental stress and disturbance, and interact with contiguous ecosystems in terms of biotic and abiotic flows and cultural interactions (IFC).
Riparian	Pertaining to, situated on or associated with the banks of a watercourse, usually a river or stream.
Riparian Habitat	Includes the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas.
River Corridors	River corridors perform several ecological functions such as modulating stream flow, storing water, removing harmful materials from water, and providing habitat for aquatic and terrestrial plants and animals. These corridors also have vegetation and soil characteristics distinctly different from surrounding uplands and support higher levels of species diversity, species densities, and rates of biological productivity than most other landscape elements. Rivers provide for migration and exchange between inland and coastal biotas.
Sustainable Development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED).
Terrestrial	Occurring on, or inhabiting, land.
Threatened Species	Umbrella term for any species categorised as Critically Endangered, Endangered or Vulnerable by the IUCN Red List of Threatened Species (*IUCN*). Any species that

	is likely to become extinct within the foreseeable future throughout all or part of its range and whose survival is unlikely if the factors causing numerical decline or habitat degradation continue to operate (EU).
Traditional Ecological Knowledge	Knowledge, innovations and practices of indigenous and local communities around the world. Developed from experience gained over the centuries and adapted to the local culture and environment, traditional knowledge is transmitted orally from generation to generation. It tends to be collectively owned and takes the form of stories, songs, folklore, proverbs, cultural values, beliefs, rituals, community laws, local language, and agricultural practices, including the development of plant species and animal breeds. Traditional knowledge is mainly of a practical nature, particularly in such fields as agriculture, fisheries, health, horticulture, and forestry (CBD).
Transformation	In ecology, transformation refers to adverse changes to biodiversity, typically habitats or ecosystems, through processes such as cultivation, forestry, drainage of wetlands, urban development or invasion by alien plants or animals. Transformation results in habitat fragmentation – the breaking up of a continuous habitat, ecosystem, or land-use type into smaller fragments.
Transformed Habitat/Land	Land that has been significantly impacted upon as a result of human interferences/disturbances (such as cultivation, urban development, mining, landscaping, severe overgrazing), and where the original structure, species composition and functioning of ecological processes have been irreversibly altered. Transformed habitats are not capable of being restored to their original states.
Tributary	A small stream or river flowing into a larger one.
Untransformed Habitat/Land	Land that has not been significantly impacted upon by man's activities. These are ecosystems that are in a near-pristine condition in terms of structure, species composition and functioning of ecological processes.
Vulnerable (Vu)	Vulnerable terrestrial ecosystems have lost some (more than 60 % remains) of their original natural habitat and their functioning will be compromised if they continue to lose natural habitat. A taxon (species) is Vulnerable when the best available evidence indicates that it meets any of the criteria for Vulnerable, and it is therefore considered to be facing a high risk of extinction in the wild (*IUCN*).
Watercourse	Natural or man-made channel through or along which water may flow. A river or spring; a natural channel in which water flows regularly or intermittently; a wetland, lake or dam into which, or from which, water flows. and a reference to a watercourse includes, where relevant, its bed and banks;
Weed	An indigenous or non-indigenous plant that grows and reproduces aggressively, usually a ruderal pioneer of disturbed areas. Weeds may be unwanted because they are unsightly, or they limit the growth of other plants by blocking light or using up nutrients from the soil. They can also harbour and spread plant pathogens. Weeds are generally known to proliferate through the production of large quantities of seed.
Wetlands	A collective term used to describe lands that are sometimes or always covered by shallow water or have saturated soils, and where plants adapted for life in wet conditions usually grow.

8.3 Appendix C: Biodiversity Environmental Management Plan

Specific measures relating to management of Biodiversity Impacts that must be included in the project Environmental Management Programme (EMPr). This Environmental Management Plan (EMP) contains guidelines, operating procedures and rehabilitation control requirements, which will be binding on the holder of the environmental authorisation after approval of the EMP. The impacts identified and listed in Section 3.3 will be managed / controlled as set out under mitigating measures and as detailed in this section, which provides general management guidelines, which may or may not be appropriate, depending on the specific circumstances.

8.3.1 Protection of Flora and Fauna

The following actions must be implemented at construction phase, where deemed necessary.

- No animals are to be harmed or killed during the course of operations.
- No domestic animals are permitted on the site.
- Trees and shrubs that are directly affected by the operations may be felled or cleared but only by the expressed written permission of the ECO.
- Rehabilitation of vegetation of the site *must* be done as described in the Rehabilitation Plans.

8.3.2 Alien and Invasive Plan Management Plan

The following mitigation measures have been identified in order to ensure that the introduction and spread of alien invasive vegetation is minimised, where deemed necessary:

- Alien species must be removed from the site as per the National Environmental Management: Biodiversity Act (No. 10 of 2004) requirements.
- A suitable weed management strategy must be implemented in the construction phase and carried through the operational phase.
- The Contractor is responsible for the removal of alien species within all areas disturbed during construction activities. Disturbed areas include (but are not limited to) access roads, construction camps, site areas and temporary storage areas.
- All alien plant material (including brushwood and seeds) should be removed from site and disposed of at a registered waste disposal site. Should brushwood be utilised for soil stabilization or mulching, it must be seed free.
- After clearing is completed, an appropriate cover crop may be required, should natural re-establishment of grasses not take place in a timely manner.

8.3.3 Fires

The following mitigation measures have been identified in order to minimise fire risks, where deemed necessary:

- The Contractor must ensure that an emergency preparedness plan is in place in order to fight accidental fires or veld fires, should they occur. The adjacent landowners/users/managers *should* also be informed or otherwise involved.
- Enclosed areas for food preparation should be provided and the Contractor *must* strictly prohibit the use of open fires for cooking and heating purposes.
- The use of branches of trees and shrubs for fire-making *must* be strictly prohibited.
- The Contractor *should* take all reasonable and active steps to avoid increasing the risk of fire through their activities on-site. No fires may be lit except at places approved by the ECO.
- The Contractor *must* ensure that the basic fire-fighting equipment is to the satisfaction of the Local Emergency Services.
- The Contractor *must* supply all living quarters, site offices, kitchen areas, workshop areas, materials, stores and any other relevant areas with tested and approved fire-fighting equipment.

- Fires and "hot work" *must* be restricted to demarcated areas.
- The Contractor *must* take precautions when working with welding or grinding equipment near potential sources of combustion. Such precautions include having a suitable, tested and approved fire extinguisher immediately at hand and the use of welding curtains.

8.3.4 Soil Aspects

The following mitigation measures have been identified in order to minimise soil loss, where deemed necessary:

- Sufficient topsoil must be stored for later use during decommissioning, particularly from outcrop areas.
- Topsoil shall be removed from all areas where physical disturbance of the surface will occur.
- Topsoil shall be kept separate from overburden and shall not be used for building or maintenance of roads.
- The stockpiled topsoil shall be protected from being blown away or being eroded. The application of a suitable grass seed/runner mix will facilitate this and reduce the minimise weeds.

8.3.5 Dust

The following mitigation measures have been identified in order to minimise dust, where deemed necessary:

- If required, water spray vehicles *will* be used to control wind cause by strong winds during activities on the works.
- No over-watering of the site or road surfaces.
- Wind screens *should* be used to reduce wind and dust in open areas.

8.3.6 Infrastructural Requirements

The following mitigation measures have been identified in order to minimise impacts of infrastructure requirements, where deemed necessary:

Topsoil

- Topsoil shall be removed from all areas where physical disturbance of the surface will occur.
- Topsoil shall be kept separate from overburden and shall not be used for building or maintenance of roads.
- The stockpiled topsoil shall be protected from being blown away or being eroded. The use of a suitable grass seed/runner mix will facilitate soil protection and minimise weeds/weed growth.

Stormwater and Erosion Control

- Stormwater Management Plans *must* be developed for the site and should include the following:
  - The management of stormwater during construction.
  - The installation of stormwater and erosion control infrastructure.
  - The management of infrastructure after completion of construction.
- Temporary drainage works may be required to prevent stormwater to prevent silt laden surface water from draining into river systems in proximity to the site. Stormwater *must* be prevented from entering or running off site.
- To ensure that site is not subjected to excessive erosion and capable of drainage runoff with minimum risk of scour, their slopes *should* be profiled at a maximum 1:3 gradient.

- Diversion channels *should* be constructed ahead of the open cuts, and above emplacement areas and stockpiles to intercept clean runoff and divert it around disturbed areas into the natural drainage system downstream of the site.
- Rehabilitation is necessary to control erosion and sedimentation of all eroded areas (where works will take place).
- Existing vegetation *must* be retained as far as possible to minimise erosion problems.
- It is importation that the rehabilitation of site is planned and completed in such a way that the runoff water will not cause erosion.
- Sediment-laden runoff from cleared areas *must* be prevented from entering rivers and streams.
- No river or surface water may be affected by silt emanating from the site.

Site Office / Camp Sites

- No site offices or camp sites will be constructed on the site under current operating conditions, existing structures will be used.

Operating Procedures in the Site

- Construction shall only take place within the approved demarcated site.
- Construction may be limited to the areas indicated by the Regional Manager on assessment of the application.
- The holder of the environmental authorisation shall ensure that operations take place only in the demarcated areas as described in this report.
- Watering to minimise the effect of dust generation should be carried out as frequently as necessary. Noise should also be kept within reason.
- No workers will be allowed to damage or collect any indigenous plant or snare any animal.
- Grass and vegetation of the immediate environment or adapted grass / vegetation will be re-established on completion of construction activities, where applicable.
- No firewood to be collected on site and the lighting of fires must be prohibited.
- Cognisance is to be taken of the potential for endangered species occurring in the area. It is considered unlikely, however, that these species will be affected by the proposed activity, or the access road.

Excavations

Whenever any excavation is undertaken, the following procedures shall be adhered to:

- Topsoil shall be handled as described in this EMP.
- Excavations shall take place only within the approved demarcated site.
- Excavations must follow the contour lines where possible.
- The construction site will not be left in any way to deteriorate into an unacceptable state.
- The excavated area must serve as a final depositing area for waste rock and overburden during the rehabilitation process.
- Once excavations have been filled with overburden, rocks and coarse natural materials and profiled with acceptable contours (including erosion control measures), the previous stored topsoil shall be returned to its original depth over the area.
- The area shall be fertilised, if necessary, to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally occurring flora.

Rehabilitation of Processing and Excavation Areas

- On completion of construction, the surface of the processing areas especially if compacted due to hauling and dumping operations shall be scarified to a depth of at least 200 mm and graded to an even surface condition and the previously stored topsoil will be returned to its original depth over the area.

- The area shall be fertilised, if necessary, to allow vegetation to establish rapidly. The site shall be seeded with suitable grasses and local indigenous seed mix.
- Waste (non-biodegradable refuse) will not be permitted to be deposited in the excavations.
- Final rehabilitation *must* comply with the requirements mention in the Rehabilitation Plan.

8.3.7 Rehabilitation Plan

The following mitigation measures have been identified in order to maximise rehabilitation success, where deemed necessary.

Rehabilitation Objective

The overall objective of the rehabilitation plan is to minimize adverse environmental impacts associated with the activity whilst maximizing the future utilization of the property. Significant aspects to be borne in mind in this regard is, revegetation of undeveloped footprint and stability and environmental risk. The depression and immediate area of the working must also be free of alien vegetation. Additional broad rehabilitation strategies / objectives include the following:

- Rehabilitating the worked-out areas to take place concurrently within prescribed framework established in the EMP.
- All infrastructure, equipment, plant and other items used during the construction period will be removed from the site.
- Waste material of any description, including scrap, rubble and tyres, will be removed entirely from the site and disposed of at a recognised landfill facility. It will not be permitted to be buried or burned on site.
- Final rehabilitation shall be completed within a period specified by the Regional Manager.

Topsoil and Subsoil Replacement

Topsoil and subsoil will be stripped and stockpiled separately and only used in rehabilitation work towards the end of the operation. This is in contract to the gravel activity where rehabilitation and topsoil replacement was earmarked at the completion of each phase.
Stripped overburden will be backfilled into the worked-out areas where needed. Stripped topsoil will be spread over the re-profiled areas to an adequate depth to encourage plant regrowth. The vegetative cover will be stripped with the thin topsoil layer to provide organic matter to the relayed material and to ensure that the seed store contained in the topsoil is not diminished. Reseeding may be required should the stockpiles stand for too long and be considered barren from a seed bank point of view. Stockpiles should ideally be stored for no longer than a year.
The topsoil and overburden will be keyed into the reprofiled surfaces to ensure that they are not eroded or washed away. The topsoiled surface will be left fairly rough to enhance seedling establishment, reduce water runoff and increase infiltration.

Revegetation

All prepared surfaces will be seeded with suitable grass species to provide an initial ground cover and stabilize the soil surface. The following grass seed that is commonly available and suitable.

Botanical name	Common name	Approx seed mixture /Ha
Cynodon dactylon	Kweek	12 kg/ Ha
Eragrostis curvula	Weeping Love Grass	6 kg/ Ha
Eragrostis tef	Teff	2 kg/ Ha
Digitaria eriantha	Smuts Grass	4 kg/ Ha
Other indigenous veld grasses can be added to the seed mix		± 4 kg/Ha

The overall revegetation plan will, therefore, be as follows:

- Ameliorate the aesthetic impact of the site.
- Stabilise disturbed soil and rock faces.
- Minimize surface erosion and consequent siltation of natural water course located on site.
- Control wind-blown dust problems.
- Enhance the physical properties of the soil.
- Re-establish nutrient cycling.
- Re-establish a stable ecological system.

Every effort must be made to avoid unnecessary disturbance of the natural vegetation during operations.

Drainage and Erosion Control

To control the drainage and erosion at site the following procedures will be adopted:

- Areas where construction is completed should be rehabilitated immediately.
- Areas to be disturbed in future activities will be kept as small as possible (i.e. conducting the operations in phases), thereby limiting the scale of erosion.
- Slopes will be profiled to ensure that they are not subjected to excessive erosion but capable of drainage runoff with minimum risk of scour (maximum 1:3 gradient).
- Existing vegetation will be retained as far as possible to minimize erosion problems.

Visual Impacts Amelioration

The overall visual impact of the proposed activities will be minimised by the following mitigating measures:

- Confining the footprint to an area as small as possible
- Re-topsoiling and vegetating all disturbed areas.

8.3.8 Monitoring and Reporting

Adequate management, maintenance and monitoring will be carried out annually by the applicant to ensure successful rehabilitation of the property until a closure certificate is obtained.
To minimise adverse environmental impacts associated with operations it is intended to adopt a progressive rehabilitation programme, which will entail carrying out the proposed rehabilitation procedures concurrently with activity.

8.3.9 Closure objectives and extent of alignment to pre-construction environment

Closure Objectives

The closure of the site will involve removal of all debris and rehabilitation of areas disturbed during the construction phase of the project. This will comprise the scarification of compacted areas, reshaping of areas, topsoiling and rehabilitating all prepared surfaces.

8.4 Appendix D: General Impact Rating Scale

To ensure a direct comparison between various specialist studies, six standard rating scales are defined and used to assess and quantify the identified impacts. This is necessary since impacts have several parameters that need to be assessed.
These scales are:

1. The Severity/ Benefit Scale, which assesses the importance of the impact from a purely technical perspective.
2. The Spatial Impact Scale, which assesses the extent or magnitude of the impact (the area that will be affected by the impact).
3. The Temporal Impact Scale, which assesses how long the impact will be felt. Some impacts are of a short duration, whereas others are permanent.
4. The Degree of Certainty Scale, which provides a measure of how confident the author feels about their prediction.
5. The Likelihood Scale, which provides an indication of the risk or chance of an impact taking place.
6. The Environmental Significance Scale, which assesses the importance of the impact in the overall context of the affected system or party.

To ensure integration of social and ecological impacts, to facilitate specialist assessment of impact significance, and to reduce reliance on value judgments, the severity of the impact within the scientific field in which it takes place (e.g. vegetation, fauna etc.) was assessed first. Thereafter, each impact was assessed within the context of time and space, and the probability of the impact occurring was quantified using the degree of certainty scale.
The impact was then assessed in the context of the whole environment to establish the "environmental significance" of the impact to the flora and vegetation.
The scales are described in detail below.

8.4.1 The Severity/ Beneficial Scale

The *severity scale* was used to scientifically evaluate how severe negative impacts would be, or how beneficial positive impacts would be on an affected system (for ecological impacts) or an affected party. This methodology attempts to remove any value judgments from the assessment, although it relies on the professional judgment of the specialist.

NEGATIVE IMPACT	POSITIVE IMPACT
Very severe An irreversible and permanent change to the affected system(s)) which cannot be mitigated. For example, change in topography resulting from a quarry.	Very Beneficiary A permanent and very substantial benefit to the affected system(s) with no alternative to achieve this benefit.
Severe Long-term impacts on the affected system(s) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming or some combination of these.	Beneficial A long-term impact and substantial benefit to the affected system(s). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these.
Moderately severe Medium- to long-term impact on the affected system(s) that could be mitigated.	Moderately beneficial A medium- to long-term impact of real benefit to the affected system(s) Other ways of optimising are equally difficult, expensive and time

NEGATIVE IMPACT	POSITIVE IMPACT
	consuming (or a combination of these), as achieving them in this way.
Slight Medium- to short term impacts on the affected system(s) Mitigation is very easy, cheap, less time consuming or not necessary.	Slightly beneficial A short- to medium-term impact and negligible benefit to the affected system(s) Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.
No effect The system(s) is not affected by the proposed development.	Do not know/Cannot know In certain cases, it may not be possible to determine the severity of the impact.

The severity of impacts can be evaluated with and without mitigation order to demonstrate how serious the impact is when nothing is done about it. For beneficial impacts, optimisation means anything that can enhance the benefits. However, mitigation or optimisation must be practical, technically feasible and economically viable.

8.4.2 Spatial and Temporal Scales

Two additional factors were considered when assessing the impacts, namely the relationship of the impact to Spatial and Temporal Scales.
The *spatial scale* (shown in italics) defines the impact at the following scales.

SPATIAL SCALE	EXPLANATION
Localised	at a localised scale (i.e. few hectares in extent). The specific area to which this scale refers is defined for the impact to which it refers.
Study Area	the site, some effects to surrounding area (*~10 km*)
District	the site, some effects to wider surrounding area (*~100 km*)
Regional	the site, some effects to surrounding area (*+250 km*)
National	Impacts will affect at a country level
International	Impacts extend beyond country boundary

The *temporal scale* (shown in italics) defines the impact at the following scales.

TEMPORAL SCALE	EXPLANATION
Short Term	Less than 5 years. Many construction phase impacts will be of a short duration
Medium Term	Between 5 and 20 years
Long Term	Between 20 and 40 years, and from a human perspective essentially permanent.
Permanent	Over 40 years and resulting in a permanent and lasting change.

8.4.3 The Degree of Certainty and the Likelihood Scale

It is also for each specialist to state the degree of certainty, or the confidence attached to their prediction of significance. For this reason, a 'degree of certainty' scale (shown in bold) must be used.

DEGREE	DESCRIPTION
Definite:	More than 90% sure of fact. To use this one will need to substantial supportive data.
Probable:	Between 70% and 90% sure of fact.
Possible:	Between 40% and 70% sure of fact.
Unsure:	Less than 40% sure of fact.

The risk or likelihood (shown in normal font) of impacts being manifested differs. There is no doubt that some impacts would occur, but certain other (usually secondary data) impacts are not as likely and may or may not result. Although these impacts maybe severe, the likelihood of them occurring may affect their overall significance and must therefore be considered. It is therefore necessary for the author to state his estimate of the likelihood of an impact occurring, using the following likelihood scale:

DEGREE	DESCRIPTION
Very unlikely	The chance of these impacts occurring is extremely slim, e.g. natural forces destroying a dam wall.
Unlikely	The risk of these impacts occurring is slight.
May occur	The risk of these impacts is more likely, although it is not definite.
Very Likely	Slight chance that this impact will not occur.
Definite	There is no chance that this impact will not occur.

8.4.4 The Environmental Significance Scale

The environmental significance scale is an attempt to evaluate the significance of an impact, the severity or benefit of which has already been assessed. This evaluation needs to be assessed in the relevant context, as an impact can either be ecological or social, or both. Since the severity of impacts with and without mitigation will already have been assessed, significance was only evaluated after mitigation. In many cases, this mitigation will take place, as it has been incorporated into project design. A six-point significance scale is applied as follows:

SIGNIFICANCE	DESCRIPTION
Very High (6)	Impacts considered to have a major and permanent change to natural environment and are rate as VERY HIGH, usually resulting to severe or very severe/ beneficial to highly beneficial effects.
High (5)	Long term change and are rated as HIGH resulting to severe or moderately severe effects/ beneficial to moderately beneficial.
Moderate (4)	Medium to long-term effects. Impacts are rated as MODERATE with moderately severe or moderately beneficial effects.
Low (3)	Medium to short term effects. Impacts are rated as MODERATE resulting in moderately severe or moderately beneficial effects.
Insignificant (2)	Short term effects are present. Impacts are rated as SLIGHT resulting in SLIGHTLY BENEFICIAL effects. Residual effects are present but are of no consequence.
No Significance (1)	No primary or secondary effects, resulting in NO SIGNIFICANT impact.
Do not Know (0)	Not possible to determine the significance of impacts

8.4.5 Absence of Data

In certain instances, an assessment must be produced in the absence of all the relevant and necessary data, due to paucity or lack of scientific information on the study area. It is more important to identify all the likely environmental impacts than to precisely evaluate the more obvious impacts. It is important to be on the conservative side in reporting likely environmental impacts. Because assessing impacts with a lack of data is more dependent on scientific judgment, the rating on the certainty scale cannot be too high. It is for these reasons that a degree of certainty scale has been provided, as well as the categories DON'T KNOW or CAN'T KNOW.

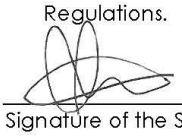
8.5 Appendix E: Declaration, Specialist Profile and Registration

DECLARATION OF THE SPECIALIST

Note: Duplicate this section where there is more than one specialist.

I Jamie Pote ....., as the appointed Specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that:

- In terms of the general requirement to be independent:
  - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the development proposal or application and that there are no circumstances that may compromise my objectivity; or
  - am not independent, but another specialist (the "Review Specialist") that meets the general requirements set out in Regulation 13 of the NEMA EIA Regulations has been appointed to review my work (Note: a declaration by the review specialist must be submitted);
- In terms of the remainder of the general requirements for a specialist, have throughout this EIA process met all of the requirements;
- I have disclosed to the applicant, the EAP, the Review EAP (if applicable), the Department and I&APs all material information that has or may have the potential to influence the decision of the Department or the objectivity of any Report, plan or document prepared or to be prepared as part of the application; and
- I am aware that a false declaration is an offence in terms of Regulation 48 of the EIA Regulations.



26/07/2024

Signature of the Specialist: Date:

N/A

Name of company (if applicable):

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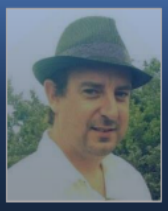

Jamie Pote

SENIOR ECOLOGIST AND ENVIRONMENTAL SCIENTIST

CONTACT

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Port Elizabeth, South Africa
Linkedin.com
Jamiepote
Bluesky-SA

ABOUT ME

16 years broad professional experience in Biodiversity, Ecological and Vegetation Assessments on over 220 projects in southern, western and central Africa. Senior Environmental Consultant and EAP on over 50 projects in the mining, infrastructure, housing and agricultural sectors. Environmental monitoring and auditing on over 50 civil infrastructure and construction projects. Have managed all aspects of projects from inception through to implementation. GIS mapping and analytics.

EDUCATION

Bachelor of Science
Rhodes University
2001 (Botany & Environmental Science)

Bachelor of Science (Honours)
Rhodes University
2002 (Botany)

Professional Natural Scientist
SACNASP
2016

SERVICES

Terrestrial Biodiversity/Ecological Assessments
Environmental & Ecological Risk-Assessments
Bioremediation, Restoration & Rehabilitation Plans
Environmental Management Plans & Programmes
GIS Mapping & Analysis & Web maps
Alien Invasive Management (Terrestrial)
Environmental Auditing & Monitoring (ECO)
Flora Search & Rescue & Relocation
Independent Environmental & Ecological review
Permit and License applications
Environmental & Mining Applications

EXPERIENCE AND CLIENTS

Key Sectors

- *Wind, Solar Energy Facilities*
- *Infrastructure and Housing*
- *Agriculture and Forestry*
- *Mining and Industrial*

Key Projects

- *Over 220 independent Biodiversity/Ecological Assessments throughout southern, western and central Africa.*
- *Mining applications and construction auditing on over 40 projects and more than 300 gravel borrow pits for the Eastern Cape Department of Roads and Public Works, Department of Transport and the South African National Roads Agency (SANRAL) throughout the Eastern Cape.*
- *South-End Precinct Mixed Use Development for Mandela Bay Development Agency - Environmental application, Ecological assessments and Construction monitoring.*
- *Coega Development Corporation IDZ projects – Ecological assessments, Flora search & rescue and Construction monitoring.*
- *Environmental applications, construction monitoring and auditing for a wide range of projects, including infrastructure and housing for various clients including the Department of Transport and SANRAL.*
- *Various agricultural expansion and infrastructure projects.*
- *Various wind and solar energy and associated infrastructure projects.*
- *Numerous infrastructure projects including electrical, water and roads.*
- Various Environmental Management and Rehabilitation Plans.

SACNASP
South African Council for Natural Scientific Professions

herewith certifies that

Jamie Robert Claude Pote

Registration Number: 115233

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice (Schedule 1 of the Act)

Ecological Science (Professional Natural Scientist)

Effective **20 July 2016** Expires **31 March 2025**

Chairperson

Chief Executive Officer

To verify this certificate scan this code

Mr Jamie Pote (BSc (Hons) PR. Sci. Nat.

PROJECT EXPERIENCE

PERFORMANCE STANDARD BIODIVERSITY AND CRITICAL HABITAT ASSESSMENTS (IFC PS6)

- DBSA Environmental & Social Safeguards Standards 9: Biodiversity Conservation and Sustainable Management Assessment: The Ilitha Fibre Project, Ethekwini 2021
- Critical Habitat & Biodiversity Assessment - Roggeveld Wind Energy Project 2020
- Biodiversity Assessment for Kalukundi Copper/Cobalt Mine, Democratic Republic of Congo 2008

TERRESTRIAL BIODIVERSITY ASSESSMENTS AND COMPLIANCE STATEMENTS

- Terrestrial Biodiversity Assessment (Addo BSD Offices) 2021
- Terrestrial Biodiversity Assessment (Blaauwater Farms) 2021
- Terrestrial Biodiversity Assessment (Buffelshoek Farm, Loerie) 2021
- Terrestrial Biodiversity & Aquatic Assessment & Review (Falcon Ridge Dam) 2021
- Terrestrial Biodiversity Assessment (Gubenxa Valley Deciduous Fruit) 2021
- Terrestrial Biodiversity Assessment (Little Chelsea Mixed-use) 2021
- Terrestrial Biodiversity Compliance Statement (Maidenhead Farm) 2021
- Terrestrial Biodiversity Review, Mulilo Total Hydra Storage Project Grid Interconnection 2021
- Terrestrial Biodiversity Compliance Statement (Lahlangubo River Bridge) 2021
- Terrestrial Biodiversity Assessment (Mbashe access roads - 3 sites) 2021
- Terrestrial Biodiversity Assessment (Burlington Farm Citrus Development, Cookhouse) 2020
- Terrestrial Biodiversity Compliance Statement: CHDM Cluster 9 Phase 3D Pipeline 2020
- Terrestrial Biodiversity Review, Mulilo Total Hydra Storage Project BESS 2020
- Terrestrial Biodiversity Assessment (Mbashe housing projects, Dutywa & Willowvale) 2020
- Terrestrial Biodiversity Assessment (Helpmekaar Dam, Tarkastad) 2020
- Terrestrial Biodiversity Assessment (Herbertsdale pipeline, Mossel Bay) 2020
- Terrestrial Biodiversity Assessment (Keurbooms Erf 155, Keurboomstrand) 2020
- Terrestrial Biodiversity Assessment (Lowmar Hydroelectric Project, Cradock) 2020
- Terrestrial Biodiversity Assessment (Mossel Bay Gas Power Plant) 2020
- Terrestrial Biodiversity Assessment (Erf 1820, Mthatha) 2020
- Terrestrial Biodiversity Assessment (Newlyn Manganese Terminal, Coega SEZ) 2020
- Terrestrial Biodiversity Assessment Thornhill Phase 2 Sanitation Link 2020

ENERGY PROJECTS (WIND FARM AND PHOTOVOLTAIC INFRASTRUCTURE)

- Preliminary Biodiversity Screening for Chrisdelina Ranch Agricultural Project, Kizenga District 2020
- Preliminary Biodiversity Screening and GIS mapping for Balekani Photovoltaic Solar Project 2020
- Preliminary Biodiversity Screening and GIS mapping for Sihhoye Photovoltaic Solar Project 2020
- Preliminary Biodiversity Screening and GIS mapping Mpaka Photovoltaic Solar Project 2020
- Preliminary Biodiversity Screening and GIS mapping for Chiwelwa Hydroelectric project 2020
- Ecological Assessment for Vermaak Boerdery Hydro Turbine (Cookhouse), Eastern Cape 2020
- Ecological Assessment for Windcurrent Wind Farm, Eastern Cape 2012
- Ecological Assessment for Universal Windfarm, NMB 2011
- Ecological Assessment for Inca Energy Windfarm, Northern Cape 2011
- Ecological Assessment for Broadlands Photovoltaic Farm, Eastern Cape 2011
- Botanical Assessment for Electrawinds Windfarm Coega, NMB 2010
- Botanical Assessment and Open Space Management Plan for Mainstream WEF Phase 2, Eastern Cape 2010

SPECIALISED ECOLOGICAL REPORTS AND REVIEWS

- Rebels Vlei Riparian delineation 2021

- Buck Kraal Dam Rehabilitation Plan Review 2020
- Rehabilitation Plan for Hitgeheim Farm (Farm 960), Sunland, Eastern Cape 2017
- Green Star Rating Ecological Assessment for SANRAL office, Bay West City, NMBM 2015
- Section 24G Assessment and Rehabilitation Plan for Bingo Farm, Eastern Cape 2014
- Mapping and Ecological services for Congo Agriculture, Republic of Congo 2013
- Rehabilitation Plan for Nieu Bethesda, Eastern Cape 2011
- Mapping of pipeline for Kenton Water Board, Eastern Cape 2010
- Rehabilitation Plan for N2 Upgrade - Coega to Colchester, NMB 2010
- Representative for landowner group for Seaview burial Park, NMB 2010
- Botanical Sensitivity Analysis for LSDF, Greenbushes-Hunters Retreat, NMB 2008
- Forestry Rehabilitation Assessment Report for Amahlathi Forest Rehabilitation, Eastern Cape 2007
- Botanical & Riparian Assessment for Orange River Weirs-Boegoeberg, Douglas Dam and Sendelingsdrif, Northern Cape 2006
- Botanical Assessment for State of the Environment Report for Chris Hani District Municipality SoER, Eastern Cape 2003

ROAD AND RAILWAY INFRASTRUCTURE PROJECTS

- Ecological Assessment for CDC IDZ Mn Terminal, conveyor and railway line, NMB 2013
- Ecological Assessment Review for Penhoek Road widening, Eastern Cape 2012
- Ecological Assessment for R61 road widening, Eastern Cape 2012
- Botanical Assessment for Chelsea RD - Walker Drive Ext., NMB 2010
- Botanical Assessment for Motherwell - Blue Water Bay Road, NMB 2010
- Ecological Assessment for Port St John Road, Eastern Cape 2010
- Botanical Basic Assessment for Bholani Village Rd, Port St Johns, Eastern Cape 2009
- Botanical Report, EMP and Rehab Plan for Coega-Colchester N2 Upgrade, NMB 2009
- Botanical Assessment for Manganese Conveyor Screening Report, NMB 2008
- Ecological Assessment for Road Layout for Whiskey Creek- Kenton, Eastern Cape 2006

MINING PROJECTS

- Ecological Assessment for Bochum Borrow Pits, Limpopo 2013
- Ecological Assessment and Mining and Rehabilitation Plan for Greater Soutpansberg Mining Project, Limpopo (3 proposed Mines) 2013
- Ecological Assessment for Thulwe Road Borrow Pits, Limpopo 2013
- Ecological Assessment and Mining and Rehabilitation Plan for Baghana Mining, Ghana 2010
- Botanical Assessment for Zwartenbosch Quarry, Eastern Cape 2008
- Botanical description & map production for Quarry - Rudman Quarry, Eastern Cape 2008
- Botanical Basic Assessment, Rehab Plan & Maps for Borrow Pit - Rocklands/Patensie, Eastern Cape 2008
- Botanical Assessment & Maps for Sandman Sand Gravel Mine, Eastern Cape 2008
- Botanical Assessment & GIS maps for Shamwari Borrow Pit, Eastern Cape 2008
- Detailed Botanical Assessment, EMP and Rehab Plan for Kalukundi Copper/Cobalt Mine, Democratic Republic of Congo 2008
- Botanical Assessment, Rehab Plan & Maps for Borrow Pit Humansdorp/Oyster Bay, Eastern Cape 2008
- Botanical Assessment, Rehab Plan & Maps for AWRM - Cala, Eastern Cape 2008
- Botanical Assessment, Rehab Plan & Maps for AWRM - Camdeboo, Eastern Cape 2008
- Botanical Assessment, Rehab Plan & Maps for AWRM - Somerset East, Eastern Cape 2008
- Botanical Assessment, Rehab Plan & Maps for AWRM - Nkonkobe, Eastern Cape 2008
- Botanical Assessment, Rehab Plan & Maps for AWRM - Ndlambe, Eastern Cape 2008
- Botanical Assessment, Rehab Plan & Maps for AWRM - Blue Crane Route, Eastern Cape 2008

- Botanical Assessment, EMP and Rehabilitation Plan for AWRM - Cathcart, Eastern Cape 2008
- Botanical Assessment, GIS maps and Rehab Plan for Mthatha Prospecting, Eastern Cape 2008
- Regional Botanical Map for mining prospecting permit, Welkom 2008
- Botanical Assessment for Scoping Report and Detailed Botanical Assessment and Rehab Plan for Elitheni Coal Mine, Eastern Cape 2007
- Botanical Assessment, Rehab Plan & Maps for Borrow Pit - Oyster Bay, Eastern Cape 2007
- Botanical Assessment, Rehab Plan & Maps for Borrow Pit - Bathurst/GHT, Eastern Cape 2007
- Botanical Assessment, Rehab Plan & Maps for Borrow Pit – Jeffreys Bay, Eastern Cape 2007
- Botanical Assessment, Rehab Plan & Maps for Borrow Pit - Storms River/Kareedouw, Eastern Cape 2007
- Biophysical Assessment for Humansdorp Quarry, Eastern Cape 2006
- Botanical Assessment, Rehab Plan & Maps for Quarry-Cathcart & Somerset East, Eastern Cape 2006
- Botanical Assessment, Rehab Plan & Maps for Quarry - Despatch Quarry, NMB 2006
- GIS Mapping & Botanical Assessment and Rehab Plan for Quarry - JBay Crushers, Eastern Cape 2006
- Botanical Assessment, EMP and Rehabilitation Plan for Polokwane Silicon Smelter, Limpopo 2006
- Application for Mining Permit for Bruce Howarth Quarry, Eastern Cape 2006

POWERLINE INFRASTRUCTURE PROJECTS

- Ecological Assessment: Dieprivier-Karreedouw 132kV Powerline realignment, Kouga LM 2016
- Eskom Ecological Walkdown: Dieprivier-Karreedouw 132 kV Powerline, Kouga LM 2016
- Eskom Solar one Ecological Walkdown: Nieuwehoop 400 kV powerline 2015
- Rehabilitation Plan and Auditing for Grassridge-Poseidon Powerline Rehab, Eastern Cape 2013
- Ecological Assessment for Dieprivier Karreedouw 132kV Powerline, Eastern Cape 2012
- Flora and Fauna search and Rescue plan for Van Stadens Windfarm Powerline, NMB 2012
- Botanical Assessment for Dedisa-Grassridge Powerline, Eastern Cape 2010
- Ecological Assessment for Grahamstown-Kowie Powerline, Eastern Cape 2010
- Species of Special Concern Mapping Transmission Line for San Souci to Nivens Drift 132kV powerline, NMB 2009
- Botanical Assessment for Eskom Powerline - Albany-Kowie, Eastern Cape 2009
- Botanical Assessment for Eskom 132 kV Dedisa Grassridge Power line-Coega, NMB 2006
- Botanical Assessment for Eskom Power line – Tyalara-Wilo, Eastern Cape 2006
- Botanical Assessment for Steynsburg - Teebus 132 kV powerline, Eastern Cape 2004

PIPELINE INFRASTRUCTURE PROJECTS

- Terrestrial Biodiversity Assessment for Thornhill Phase 2 Sanitation Link, Ndlambe, Eastern Cape 2020
- Botanical Assessment for Ngqamakhwe Regional Water Supply Scheme (Phase 3) 2018
- Ecological Assessment for Butterworth Emergency Bulk Water Supply Scheme 2017
- Ecological Assessment for Karringmelkspruit Emergency Bulk Water Supply (Lady Grey) 2017
- Ecological Assessment for Wanhoop-Willowmore Bulk Water Supply, Eastern Cape 2016
- Ecological Assessment for Steytlerville Bulk Water Supply, Eastern Cape (Phase 4) 2013
- Ecological Assessment for Steytlerville Bulk Water Supply, Eastern Cape (Phase 5) 2013
- Detailed Ecological Assessment for Suikerbos Pipeline, Gauteng 2012
- Basic Botanical Assessment for Wanhoop farm pipeline, Eastern Cape 2010
- Basic Botanical Assessment for Chatty Sewer, NMB 2010
- Species of Special Concern Mapping for Seaview Pipeline, NMB 2009
- Species of Special Concern Mapping for Chelsea Bulk Water Pipeline, NMB 2009
- Map Production for Russell Rd Stormwater, NMB 2008
- Basic Botanical Assessment for Albany Pipeline, Eastern Cape 2008
- Environmental Risk Assessment for Elands River pipeline, Eastern Cape 2007

- Detailed Botanical Assessment for Motherwell Pipeline, NMB 2007
- Detailed Botanical Assessment, GIS maps for Erasmuskloof Pipeline, Eastern Cape 2007
- Botanical & Floristic Report for Hankey pipeline, Eastern Cape 2006
- Detailed Botanical Assessment for Port Alfred water pipeline, Eastern Cape 2004

GENERAL INFRASTRUCTURE DEVELOPMENT PROJECTS

- Ecological Assessment for Amalinda crossing, BCM, Eastern Cape 2019
- Ecological Assessment for Cookhouse Bridge rehabilitation and temporary deviation, Eastern Cape 2019
- Ecological Assessment for Nelson Mandela University Access Road, NMB 2019
- Botanical Assessment for Zachtevlei Dam (Lady Grey), Eastern Cape 2017
- Botanical Assessment for Gcebula River bridge (Peddie), Eastern Cape 2017
- Botanical Assessment for Kouga Dam wall upgrade, Eastern Cape 2012
- Botanical Assessment for Jansenville Cemetery, Eastern Cape 2009
- Botanical Assessment for Radar Mast construction for South African Weather Service – BCM & NMB 2008
- Botanical Assessment and GIS mapping for golf course realignment for East London Golf Course, BCM, Eastern Cape 2007
- Botanical Assessment for PE Airport Extention, NMB 2006
- Botanical Assessment for Kidd's Beach Desalination Plant, BCM, Eastern Cape 2006

HOUSING DEVELOPMENT PROJECTS

- Terrestrial Biodiversity Assessment for Erf 1820 Mthatha, KSDM, Eastern Cape 2020
- Ecological Assessment for Erf 599 Walmer Mixed Use Development, Nelson Mandela Bay 2019
- Ecological Assessment Portion 21-23 and 41 of Farm 807, Gonubie, Buffalo City 2019
- Ecological Assessment for Emerald Sky Housing Project, BCMM 2019
- Ecological Assessment for Erf 14, Kabega, Port Elizabeth 2017
- Ecological Assessment for Fairwest Rental Housing, Port Elizabeth 2017
- Ecological Assessment for Hankey Housing, Kouga District Municipality 2015
- Ecological Assessment for Lebowakgoma Housing, Limpopo 2013
- Ecological Assessment for Giyani Development, Limpopo 2013
- Ecological Assessment for Palmietfontein Development, Limpopo 2013
- Ecological Assessment for Seshego Development, Limpopo 2013
- Botanical Assessment for Sheerness Road, BCM, Eastern Cape 2013
- Ecological Assessment for Ethembeni Housing, NMB 2012
- Ecological Assessment for Pelana Housing, Limpopo 2012
- Flora Search and Rescue Plan for Kwanobuhle Housing, Western Cape 2011
- Botanical Assessment for The Crags 288/03, Western Cape 2010
- Ecological Assessment Revision Report for Fairview Housing, NMB 2010
- Botanical Assessment, EMP and Open Space Management Plan for Hornlee Housing Development, Western Cape 2010
- Botanical Assessment for Little Ladywood, Western Cape 2010
- Botanical Assessment and Open Space Management Plan for Motherwell NU31, NMB 2010
- Botanical Assessment and Open Space Management Plan for Plett 443/07, Western Cape 2010
- Botanical Assessment for Willow Tree Farm, NMB 2010
- Botanical Assessment for Kouga RDP Housing, Eastern Cape 2009
- Botanical Assessment for Fairview Erf 1226 (Wonderwonings), NMB 2009
- Species List Compilation for Zeekoerivier Humansdorp, Eastern Cape 2009
- Botanical Assessment for Woodlands Golf Estate (Farm 858), BCM, Eastern Cape 2009

- Botanical Assessment for Plettenberg Bay - 438/4, Western Cape 2009
- Vegetation Assessment for Kwanokuthula RDP housing project, Western Cape 2008
- Site screening assessment for Greenbushes Site screening, NMB 2008
- Botanical Assessment for Fairfax development, Eastern Cape 2008
- Botanical Assessment for Plettenberg Bay Brakkloof 50&51, Western Cape 2008
- Botanical Assessment, GIS mapping for Theescombe Erf 325, NMB 2008
- Site Screening for Mount Road, NMB 2008
- Botanical Assessment for Greenbushes Farm 40 Swinburne 404, NMB 2008
- Botanical Assessment for Greenbushes 130, NMB 2008
- Botanical Assessment for Greenbushes Kuyga no. 10, NMB 2008
- Botanical Assessment for Plettenberg Bay - 438/24, Western Cape 2007
- Botanical Assessment for Plettenberg Bay - Olive Hills 438/7, Western Cape 2007
- Botanical Assessment for Gonubie Portion 809/9, BCM, Eastern Cape 2006
- Botanical Assessment for Glengariff Farm 723, BCM, Eastern Cape 2006
- Botanical Assessment for Gonubie Portion 809/10, BCM, Eastern Cape 2006
- Botanical Assessment for Gonubie Portion 809/4 & 5, BCM, Eastern Cape 2006
- Botanical Assessment for Plettenberg bay - Ladywood 438/1&3, Western Cape 2006
- Botanical Assessment and Rehab Plan for Winterstrand Desalination Plant, BCM 2006
- Botanical Assessment for Bosch Hoogte, NMB 2006
- Botanical Assessment for Plettenberg bay Farm 444/38, Western Cape 2006
- Botanical Assessment for Plettenberg Bay - 444/27, Western Cape 2006
- Botanical Assessment for Leisure Homes, BCM, Eastern Cape 2006
- Botanical Basic Assessment for Trailees Wetland Assessment, Eastern Cape 2005
- Botanical Assessment and Rehab Plan for Arlington Racecourse - PE, NMB 2005
- Botanical Assessment for Smart Stone, NMB 2005
- Botanical Assessment for Peninsular Farm (Port Alfred), Eastern Cape 2005
- Botanical Assessment for Mount Pleasant - Bathurst, Eastern Cape 2005
- Botanical Assessment and RoD amendments for Colchester Erven 1617 & 1618 (Riverside), NMB 2005
- Basic Botanical Assessment for Parsonsvlei 3/4, Eastern Cape 2005
- Botanical Assessment for Bridgemead – Malabar PE, NMB 2004

AGRICULTURAL PROJECTS

- Ecological Assessment for Vermaak Boerdery Hydro Turbine (Cookhouse)2020 2020
- Thornhill Eggland Specialist Ecological Assessment 2020
- Ecological Assessment for Citrus expansion on Hitgeheim Farm, Sunland, Eastern Cape 2015
- Ecological Assessment for Citrus expansion on farm 960, Patensie (AIN du Preez Boerdery) 2014
- Ecological Assessment for Doornkraal Pivot (Hankey), Eastern Cape 2014
- Ecological Assessment for Tzaneen Chicken Farm, Limpopo 2013
- Botanical Assessment and Open Space Management Plan for Kudukloof, NMB 2010
- Botanical Assessment and Open Space Management Plan for Landros Veeplaats, NMB 2010
- Botanical Assessment and Flora Relocation Plan for Wildemans Plaas, NMB 2006

GOLF ESTATE AND RESORT DEVELOPMENT PROJECTS

- Species List& Comments Report for Kidds Beach Golf Course, BCM, Eastern Cape 2009
- Botanical Assessment for Plettenberg Bay -Farm 288/03, Western Cape 2009
- Botanical Assessment for Rockcliff Golf Course, BCM, Eastern Cape 2008
- Botanical Assessment for Rockcliff Resort Development, BCM, Eastern Cape 2007
- Botanical Assessment, EMP and Rehabilitation Plan for Tiffendel Ski Resort, Eastern Cape 2006

MIXED USE DEVELOPMENT PROJECTS

- Ecological Assessment for South-End Precinct Mixed Use Development, Nelson Mandela Bay 2018
- Botanical Assessment, EMP and Open Space Management Plan for Bay West City, NMB 2010
- Botanical Assessment, GIS maps, Open Space and Rehab Plans for Fairview Erf 1082, NMB 2009
- Botanical Assessment and GIS maps for Utopia Estate PE, NMB 2008
- Botanical Assessment and GIS mapping for Madiba Bay Leisure Park, NMB 2007
- Botanical Assessment and GIS mapping for Madiba Bay Leisure Park, NMB 2007
- Botanical Basic Assessment for Cuyler Manor (Farm 320), Uitenhage, NMB 2007

BUSINESS AND INDUSTRIAL DEVELOPMENT PROJECTS

- Ecological Assessment for Parsonsvlei Erf 984 & 1134 Parsonsvlei, NMB 2020
- Mthatha Retails and Service Center 2020
- Ecological Assessment for Walmer Erf 11667 - Bidfood Warehousing Development, NMB 2020
- Ecological Assessment for Portion 87 of the Farm Little Chelsea No 10, NMB 2020
- Ecological Assessment for Bay West City ENGEN Service Station, NMB 2015
- Ecological Assessment for Green Star grading for SANRAL, NMB 2014
- Ecological Assessment for OTGC Tank Farm, NMB 2012
- Botanical Assessment and Open Space Management Plan for Petro SA Refinery, Coega IDZ, NMB 2010
- Botanical Assessment for Bluewater Bay Erf 805, NMB 2009
- Ecological Assessment for Bay West City, NMB 2007
- Botanical Assessment for Kenton Petrol Station, Eastern Cape 2005
- Botanical Assessment and RoD amendments for Colchester Petrol Station, NMB 2005

ECO-ESTATE DEVELOPMENT PROJECTS

- Botanical Re-Assessment of Swanlake Eco Estate, Aston Bay, Eastern Cape 2018
- Detailed Botanical Assessment and Open Space Management Plan for Olive Hills, Western Cape 2010
- Botanical Assessment and EMP for Zwartenbosch Road, Eastern Cape 2010
- Botanical Assessment - Poultry Farm for Coega Kammaskloof Farm 191, NMB 2008
- Botanical Assessment - Housing development for Coega Ridge, NMB 2008
- Botanical Assessment, Rehabilitation Plan, EMP and GIS maps for Amanzi Estate, NMB, 2008
- Botanical Assessment for Roydon Game farm, Queenstown, Eastern Cape 2007
- Botanical Assessment for Winterstrand Estate (Farm 1008), BCM, Eastern Cape 2007
- Botanical Assessment for Homeleigh Farm 820, BCM, Eastern Cape 2007
- Botanical Basic Assessment, Rehab Plan & Maps for Candlewood, Tsitsikamma, Western Cape 2007
- Botanical Assessment, EMP and Rehab Plan for Carpe Diem Eco development, Eastern Cape 2007
- Botanical Assessment, EMP and Rehabilitation Plan for Seaview Eco-estate, NMB 2006
- Botanical Assessment for Kidd's Beach portion 1076, BCM, Eastern Cape 2006
- Botanical Assessment for Palm Springs, Kidds Beach East London, BCM, Eastern Cape 2006
- Botanical Assessment for Nahoon Farm 29082, BCM, Eastern Cape 2006
- Botanical Assessment for Rosehill Farm, Eastern Cape 2005
- Botanical Assessment for Resolution Game Farm, Eastern Cape 2005
- Botanical Assessment for Gonubie Portion 809/11, BCM, Eastern Cape 2005
- Botanical Assessment for Kidd's Beach portion 1075, BCM, Eastern Cape 2005

FLORA AND FAUNA RELOCATION PLANS, PERMITS AND IMPLEMENTATION

- Flora Search and Rescue for Nelson Mandela University Phase 2 & 3 Residences, Eastern Cape 2020

- Flora Search and Rescue for Fairwest Housing Estate, Nelson Mandela Bay, Eastern Cape 2019
- Flora Search and Rescue for Utopia Estate, Nelson Mandela Bay, Eastern Cape 2019
- Flora Search and Rescue for Citrus expansion on Boschkraal Citrus Farm, Sunland, Eastern Cape 2018
- Flora Search and Rescue for Wanhoop pipeline, Willowmore, Eastern Cape 2018
- Flora Search and Rescue for Wilgekloof pipeline, Willowmore, Eastern Cape 2018
- Flora Search and Rescue for Citrus expansion on Hitgeheim Farm (Farm 960), Sunland, Eastern Cape 2017
- Flora Search and Rescue for Steytlerville Bulk Water Supply, Eastern Cape (Phase 5) 2016
- Flora Search and Rescue for Citrus expansion on Farm 960, Patensie (AIN du Preez Boerdery) 2016
- Flora Search and Rescue for Steytlerville Bulk Water Supply & WTW, Eastern Cape (Phase 4) 2015
- Flora and Fauna Search and Rescue for Riversbend Citrus Farm, NMB 2014
- Flora and Fauna Search and Rescue for Mainstream Windfarm, Eastern Cape 2013
- Flora Search and Rescue for Steytlerville Bulk Water Supply, Eastern Cape (Phase 1, 2 & 3) 2013
- Flora and Fauna Search and Rescue for OTGC Tank Farm, Coega IDZ, NMB 2013
- Flora and Fauna Search and Rescue for Jeffreys Bay School, Eastern Cape 2013
- Flora Search and Rescue Plan for Red Cap Wind Farm, Eastern Cape 2012
- Flora Relocation for Disco Poultry Farm, NMB 2010
- Flora Relocation for Mainstream Windfarm, Eastern Cape 2010

ENVIRONMENTAL MANAGEMENT PLANS

- Final Environmental Management Programme (EMPr) and Maintenance Management Plan for South End Precinct Mixed Use Zone, Nelson Mandala Bay Municipality 2020
- Final Environmental Management Programme (EMPr) for Coega Land-Based Aquaculture Development Zone (ADZ), Coega Industrial Development Zone (IDZ), Nelson Mandela Bay Municipality 2019
- Basic Botanical Assessment for Kromensee EMP (Jeffries Bay), Eastern Cape 2010
- Wetland Management Plan for NMB Portnet, NMB 2010
- Baseline Botanical Study, Vegetation mapping and EMP for Local Nature Reserve for Plettenberg Bay Lookout LNA, Western Cape 2009
- Biodiversity & Ecological Processes for Bathurst-Commonage, Eastern Cape 2006
- EMP for Kromensee EMP (Jeffries Bay), Eastern Cape 2006
- Floral Survey for Mbotyi Conservation Assessment, Eastern Cape 2005
- Identifying and Assessment on Aquatic Weeds for Pumba Private Game Reserve, Eastern Cape 2005

BASIC ASSESSMENT APPLICATION PROJECTS (DEDEAT)

- Basic Assessment Application for Parsonsvlei Erf 984 & 1134 Parsonsvlei 2020
- Construction of Deviation and Rehabilitation of Bridge along DR02481 road 2020
- Basic Assessment Application for Vermaak Boerdery Hydro Turbine (Cookhouse) 2020
- Basic Assessment Application for Walmer Erf 11667 Bidfood Warehousing Development 2020
- Basic Assessment Application for Portion 87 of the Farm Little Chelsea No 10 2020
- Basic Assessment Application for Nelson Mandela University Access Road, NMB 2019
- Basic Assessment, WULA and Borrow Pit/Quarry Mining Application, Clarkebury Rd, Idutywa 2019

- Basic Assessment Application for Erf 599 Walmer Mixed Use Development, Nelson Mandela Bay 2019
- Basic Assessment Application for Cookhouse Bridge rehabilitation and temporary deviation 2019
- Basic Assessment Application for Erf 14 Kabega, NMBM 2017
- Basic Assessment Application for Hankey Housing, Kouga District Municipality 2017
- Basic Assessment Application for Fairwest Rental Housing, Nelson Mandela Bay 2017
- Basic Assessment Application for Citrus expansion on Hitgeheim Farm, Sunland, Eastern Cape 2015

- Basic Assessment Application for Hankey Housing, Kouga District Municipality 2015
- Basic Assessment Application for Citrus expansion on farm 960, Patensie (AIN du Preez Boerdery) 2014
- Basic Assessment Application for South-End Precinct Mixed Use Development, Nelson Mandela Bay 2018

MINING PERMIT/ENVIRONMENTAL MANAGEMENT PROGRAMME APPLICATIONS (DMR)

- Mining BAR/EMP's for Blue Crane Route & Camdeboo LM 12 Borrow Pits – (DoT) 2019
- Mining BAR/EMP's for Elundini LM 6 Borrow Pits (DoT)
- Mining BAR/EMP's for Baviaans LM 6 Borrow Pits (DoT)
- Mining BAR/EMP's for Kouga & Koukamma LM 12 Borrow Pits (DoT)
- Mining BAR/EMP's for Sakhisizwe & Engcobo LM 12 Borrow Pits (DoT)
- Mining BAR/EMP's for Senqu LM 12 Borrow Pits (DoT)
- Mining BAR/EMP's for 24 Borrow Pits in 6 districts within the Eastern Cape– (SANRAL) 2018
- Mining BAR/EMP's for Ingquza Hill LM Borrow Pits – (SANRAL) 2017
- Mining BAR/EMP's for Baviaans LM Borrow Pits – (DRPW) 2017
- Mining BAR/EMP's for Senqu LM Borrow Pits – (DRPW) 2017
- Mining BAR/EMP's for Kouga/Koukamma LM Borrow Pits – (DRPW) 2017
- Mining BAR/EMP's for Inkwanca (Enoch Mgijima) LM Borrow Pits – (DRPW) 2017
- Mining BAR/EMP's for Kouga/Koukamma LM Borrow Pits – (DRPW) 2017
- Mining BAR/EMP's for Sakhisizwe/Engcobo LM Borrow Pits – (DRPW) 2017
- Mining BAR/EMP's for Raymond Mahlaba LM Borrow Pits – (DRPW) 2017
- Mining BAR/EMP's for Camdeboo LM Borrow Pits – (DRPW) 2017
- Mining BAR/EMP's for Elundini LM Borrow Pits – (DRPW) 2017
- Mining BAR/EMP's for Emalahleni/Intsika Yethu LM Borrow Pits – (DRPW) 2017
- Mining BAR/EMP's for Nkonkobe LM Borrow Pits – (SANRAL) 2016
- Mining BAR/EMP's for Mbhashe LM Borrow Pits – (SANRAL) 2016
- Mining BAR/EMP's for Mbizana LM Borrow Pits – (SANRAL) 2016
- Mining BAR/EMP's for Senqu LM Borrow Pits – (SANRAL) 2016
- Mining BAR/EMP's for Elundini LM Borrow Pits – (SANRAL) 2016
- Mining BAR/EMP's for Emalahleni LM Borrow Pits – (SANRAL) 2016
- Mining BAR/EMP's for Emalahleni LM Borrow Pits – (DRPW) 2016
- Mining BAR/EMP's for Ikwezi/Baviaans LM Borrow Pits – (DRPW) 2016
- Mining BAR/EMP's for Chris Hani DM Borrow Pits - MR00716 (Tarkastad) (DRPW) 2015
- Mining BAR/EMP's for Chris Hani DM Borrow Pits – Intsika Yethu and Emalahleni (DRPW) 2015
- Mining BAR/EMP's for Joe Gqabi DM Borrow Pits – Senqu (DRPW) 2015
- Mining BAR/EMP's for Makana/Ndlambe LM Borrow Pits – Sarah Baartman (DRPW) 2015
- Mining BAR/EMP's for Amahlathi LM Borrow Pits – Amatole (DRPW) 2015
- Mining BAR/EMP's for Mbashe/Mqume LM Borrow Pits – Amatole (DRPW) 2015
- Mining BAR/EMP's for Sundays River Valley LM Borrow Pits – Sarah Baartman (DRPW) 2015
- Mining BAR/EMP's for Kouga LM Borrow Pits – Sarah Baartman (DRPW) 2015
- Mining BAR/EMP's for Chris Hani DM Borrow Pits - MR00716 (DRPW) 2014
- Mining BAR/EMP's for Chris Hani DM Borrow Pits - DR02581 (DRPW) 2014
- Mining BAR/EMP's for Chris Hani DM Borrow Pits - DR08041, DR08247, DR08248 & DR08504 (DRPW) 2014
- Mining BAR/EMP's for Chris Hani DM Borrow Pits - DR08599, DR08601 & DR08570 (DRPW) 2014
- Mining BAR/EMP's for Chris Hani DM Borrow Pits - DR08235, DR08551 & DR08038 (DRPW) 2014
- Mining BAR/EMP's for Alfred Nzo DM Borrow Pits - DR08092, DR08093 & DR08649 (DRPW) 2014
- Mining BAR/EMP's for Alfred Nzo DM Borrow Pits - DR08090, DR08412, DR08425, DR08129, DR08109, DR08106, DR08104 & DR08099 – Matatiele (DRPW) 2014

ENVIRONMENTAL COMPLIANCE AUDITING

- Environmental Compliance Audit (Habata Boerdery) 2021
- Environmental Compliance Audit (Sontule Farm) 2021

ENVIRONMENTAL MANAGEMENT, AUDITING, COMPLIANCE AND MONITORING PROJECTS

- Environmental Auditing Services Pre-construction and Construction (Rocky Coast Farm) 2021
- Environmental Auditing Services (Middledrift Breeder Facility) 2021
- Coega Aquaculture Development Zone Environmental Compliance and Monitoring for Construction (24 Months) 2020
- Construction of NMU West End Student Residences Phases 1 & 3 Environmental Control Office (30 Months) 2020
- Environmental Auditing and construction monitoring for construction of Phase 1 River Park (South End Precinct) 2020
- Waste Management License audit for Bedford Recycling project 2020
- Auditing for Construction of Fairwest Village Housing Project 2019
- Auditing for Construction of Utopia Estate monthly auditing 2019
- ECO for DRPW IRM Road Maintenance projects, Baviaans LM 2019
- ECO for DRPW IRM Road Maintenance projects, Senqu LM 2019
- ECO for DRPW IRM Road Maintenance projects, Kouga/Koukamma LM 2019
- ECO for DRPW IRM Road Maintenance projects, Sakhisizwe/Engcobo LM 2019
- ECO for DRPW IRM Road Maintenance projects, Elundini LM 2019
- ECO for DRPW IRM Road Maintenance projects, Emalahleni/Intsika Yethu LM 2019
- ECO for Construction of Fairwest Village Housing Project 2019
- ECO for Construction of Utopia Estate Mixed Use Project 2019
- ECO for Construction of NMU West End Student Residences Phases 1 & 3 2019
- ECO for Construction of Eco-Pullets pullet rearing facility, Paterson 2018
- ECO for DRPW IRM Road Maintenance projects, Raymond Mahlaba LM 2018
- ECO for DRPW IRM Road Maintenance projects, Inkwanca (Enoch Mgijima) LM 2018
- ECO for Citrus expansion on Farm 960, Patensie (AIN du Preez Boerdery) 2017
- ECO for Citrus expansion on Hitgeheim Farm (Farm 960), Sunland, Eastern Cape 2017
- DEO for improvement of national route R67 section 5 from Whittlesea (km 0.00) to Swart Kei river (km 15.40) – Murray & Roberts 2017
- ECO for SANRAL RRP Road Maintenance projects, Mbizana LM 2017
- ECO and Botanical Specialist for the special maintenance of national route R61 Section 2 from Elinus Farm (km 42.2) to N10 (km 85.0) (SANRAL) 2016
- Environmental Control Officer (ECO): Construction of NSRI Slipway - Port Elizabeth Harbour 2016
- ECO for SANRAL RRP Road Maintenance projects, Mbashe LM 2016
- ECO for SANRAL RRP Road Maintenance projects, Nkonkobe LM 2016
- ECO for SANRAL RRP Road Maintenance projects, Mbizana LM 2016
- ECO for SANRAL RRP Road Maintenance projects, Senqu LM 2016
- ECO for SANRAL RRP Road Maintenance projects, Elundini LM 2016
- ECO and Environmental Management for closure of Bushmans River Landfill site 2016
- ECO for DRPW IRM Road Maintenance projects, Amahlathi Municipality 2015
- ECO for DRPW IRM Road Maintenance projects, Makana/Ndlambe Municipality 2015
- ECO for DRPW IRM Road Maintenance projects, Mbashe/Mqume Municipality 2015
- ECO for DRPW IRM Road Maintenance projects, Port St Johns, Mbizana, Ingquza Hill LM's 2015
- ECO for Riversbend Citrus Farm, NMB 2014
- ECO for Alfred Nzo DM Road resurfacing - DR08071, DR08649, DR08092, DR08418, DR08452, DR08015, DR08085, DR08639 & DR08073, Eastern Cape - MSBA 2014

- ECO Audits for Koukamma Flood Damage Road Repairs – Hatch Goba 2014
- EMP and ECO for Utopia Estate, NMB 2013
- Final EMPr submission for Seaview Garden Estate, NMB 2012
- ECO audits for NMB Road surfacing, NMB (multiple contacts) 2011
- EMPr submission and ECO for Seaview Garden Estate, NMB 2010
- ECO for Mainstream Windfarm wind monitoring mast installation, Eastern Cape 2010
- EMP and ECO for Sinati Golf Estate EMP, BCM, Eastern Cape 2009
- Flora Relocation Plan and Permit application for Wildemans Plaas, NMB 2006

ENVIRONMENTAL SCREENING PROJECTS

- Somerset East Stormwater Environmental Screening Report 2021
- Woodlands Diary Road Upgrade Environmental Screening Report, Kouga LM 2021
- Risk Assessment and Screening for proposed Heatherbank access road, NMB 2020
- Environmental Screening Report for Proposed Life Hospital parking expansion, NMB 2019
- Environmental Screening Report for Erf 984 & 1134 development, Parsonsvlei, NMB 2019
- Environmental Screening Report for proposed Khayalethu School, Buffalo City 2018
- Environmental Screening Report for Proposed Housing Development of Erf 8700, Kabega Park, NMB 2017
- Environmental Screening Report for Proposed Housing Development of Erf 14, Kabega Park, NMB 2017
- Environmental Screening Report for Proposed Fairwest Social Housing project, Fairview, NMB 2016
- Environmental Screening Report for Development of Little Chelsea No 25, NMB 2016
- Terrestrial Vegetation Risk Assessment for proposed Skietnek Citrus Farm development (Kirkwood) 2015
- Preliminary Environmental Risk Assessment: NSRI Slipway Port Elizabeth 2015
- Environmental Screening Report for Proposed Development of a Dwelling on Erf 899, Theescombe 2015
- Environmental Screening Report for Proposed Development on Erf 559, Walmer, Port Elizabeth 2015
- Environmental Screening Report for Proposed Housing Scheme Development of Erf 8709, Wells Estate 2015
- Environmental Screening Report for Development of Portion 10 of Little Chelsea No 87, NMB 2015

SECTION 24G APPLICATIONS

- 12 000 ML Dam constructed on farm 960, Patensie (MGM Trust) 2015
- Illegal clearing of 20 Ha of lands on Hitgeheim Farm, Sunland, Eastern Cape 2015

CONFERENCES AND PUBLICATIONS

- Pote, J., Shackleton, C.M., Cocks, M. & Lubke, R. 2006. *Fuelwood harvesting and selection in Valley Thicket*, South Africa. Journal of Arid Environments, 67: 270-287.
- Pote, J., Cocks, M., Dold, T., Lubke, R.A. and Shackleton, C. 2004. *The homegarden cultivation of indigenous medicinal plants in the Eastern Cape*. Indigenous Plant Use Forum, 5 - 8 July 2004, Augsburg Agricultural School, Clanwilliam, Western Cape.
- Pote, J. & Lubke, R.A. 2003. *The selection of indigenous species suitable for use as fuelwood and building materials as a replacement of invasive species that are currently used by the under-privileged in the Grahamstown commonage.* Working for Water Inaugural Research Symposium 19 - 21 August 2003, Kirstenbosch. Poster presentation.
- Pote, J. & Lubke, R.A. 2003. *The screening of indigenous pioneer species for use as a substitute cover crop for rehabilitation after removal of woody alien species by WfW in the grassy fynbos biome in the Eastern Cape*. Working for Water Inaugural Research Symposium 19 - 21 August 2003, Kirstenbosch, South Africa.

OTHER RESEARCH EXPERIENCE

- Resource assessment of bark stripped trees in indigenous forests in Weza/Kokstad area (June 2000; Dr C. Geldenhuis & Mr. M. Kaplin).
- Working for Water research project for indigenous trees for woodlots (December 2000/January 2001; Prof R.A. Lubke, Rhodes University).
- Project coordinator and leader of the REFYN project – A BP conservation gold award: Conservation and Restoration of Grassy-Fynbos. A multidisciplinary project focusing on management, restoration and public awareness/education (2001 – 2002).
- Conservation Project Management Training Workshops: Royal Geographical Society, London 2001 – Fieldwork Techniques, Habitat Assessment, Biological Surveys, Project Planning, Public Relations and Communications, Risk Assessment, Conservation Education
- Selection and availability of wood in Crossroads village, Eastern Cape, South Africa. Honours Research Project 2002. Supervisors: Prof. R.A. Lubke & Prof. C. Shackleton.
- Floral Morphology, Pollination and Reproduction in Cyphia (LOBELIACEAE). Honours Research Project 2002. Supervisor: Mr. P. Phillipson.
- Forestry resource assessment of bark-stripped species in Amatola District (December 2002; Prof R.A. Lubke).
- Homegarden Cultivation of Medicinal Plants in the Amathole area. Postgraduate Research Project (2003-2005; Prof R.A. Lubke, Prof C.M. Shackleton and Ms C.M., Cocks).

8.6 Appendix F: Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity

SCOPE

The protocol (*Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for environmental authorisation* (GN 320, 20 March 2020)) provides the criteria for the assessment and reporting of impacts on terrestrial biodiversity for activities requiring environmental authorisation.

The protocol (*Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of sections 24(5)(a) and (h) and 44 of NEMA, gazetted on 30 October 2020*), provides the criteria for the assessment and reporting of impacts on plant and animal species for activities requiring environmental authorisation.

These protocols replace the requirements of Appendix 6 of the Environmental Impact Assessment Regulation[6].

The assessment and minimum reporting requirements of this protocol are associated with a level of environmental sensitivity identified by the national web based environmental screening tool (https://screening.environment.gov.za/screeningtool). The requirements for terrestrial biodiversity are for landscapes or sites which support various levels of biodiversity. The relevant terrestrial biodiversity data in the screening tool has been provided by the South African National Biodiversity Institute[7].

SITE SENSITIVITY VERIFICATION AND MINIMUM REPORT CONTENT REQUIREMENTS

Prior to commencing with a specialist assessment, the current use of the land and the potential environmental sensitivity of the site under consideration as identified by the screening tool must be confirmed by undertaking a site sensitivity verification.

2.1. The site sensitivity verification must be undertaken by an environmental assessment practitioner or a specialist.

2.2. The site sensitivity verification must be undertaken through the use of:

(a) a desk top analysis, using satellite imagery,

(b) a preliminary on-site inspection; and

(c) any other available and relevant information.

2.3. The outcome of the site sensitivity verification must be recorded in the form of a report that:

(a) confirms or disputes the current use of the land and environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.;

(b) contains a motivation and evidence (e.g., photographs) of either the verified or different use of the land and environmental sensitivity; and

(c) is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations.

[6] The Environmental Impact Assessment Regulations, as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act 107 of 1998).

[7] The biodiversity dataset has been provided by the South African National Biodiversity Institute (for details of the dataset, click on the options button to the right of the various biodiversity layers on ther screening tool).

TERRESTRIAL BIODIVERSITY SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
1	**General Information**	-
1.1	An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified on the screening tool as being "*very high sensitivity*" for terrestrial biodiversity, must submit a Terrestrial Biodiversity Specialist Assessment.	✓
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 ***'low sensitivity'*** for terrestrial biodiversity, must submit a Terrestrial Biodiversity Compliance Statement.	✓
1.3	However, where the information gathered from the site sensitivity verification differs from the designation of ***'very high'*** terrestrial biodiversity sensitivity on the screening tool and it is found to be of a ***'low'*** sensitivity, then a Terrestrial Biodiversity Compliance Statement must be submitted.	✓
1.4	Similarly, where the information gathered from the site sensitivity verification differs from that identified as having a ***'low'*** terrestrial biodiversity sensitivity on the screening tool, a Terrestrial Biodiversity Specialist Assessment must be conducted.	✓
1.5	If any part of the proposed development footprint falls within an area of ***'very high'*** sensitivity, the assessment and reporting requirements prescribed for the ***'very high'*** sensitivity apply to the entire footprint, excluding linear activities for which impacts on terrestrial biodiversity are temporary and the land in the opinion of the terrestrial biodiversity specialist, based on the mitigation and remedial measures, can be returned to the current state within two years of the completion of the construction phase, in which case a compliance statement applies. Development footprint in the context of this protocol means the area on which the proposed development will take place and includes any are that will be disturbed.	✓
	VERY HIGH SENSITIVITY RATING for terrestrial biodiversity features	
3.1.13	a motivation must be provided if there were development footprints identified as per paragraph 2.3.6 above that were identified as having a 'low' terrestrial biodiversity sensitivity and that were not considered appropriate,	✓
	LOW SENSITIVITY RATING – for terrestrial biodiversity features	
4	**Terrestrial Biodiversity Compliance Statement**	✓
4.1	The compliance statement must be prepared by a specialist registered with the SACNASP and having expertise in the field of ecological sciences.	✓
4.2	The compliance statement must:	
4.2.1	be applicable to the preferred site and proposed development footprint;	✓
4.2.2	confirm that the site is of 'low' sensitivity for terrestrial biodiversity; and	✓
4.2.3	indicate whether or not the proposed development will have any impact on the biodiversity feature.	✓
4.3	The compliance statement must contain, as a minimum, the following information:	
4.3.1	the contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	✓
4.3.2	a signed statement of independence by the specialist;	✓
4.3.3	a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	✓
4.3.4	a baseline profile description of biodiversity and ecosystems of the site;	✓
4.3.5	the methodology used to verify the sensitivities of the terrestrial biodiversity features on the site, including equipment and modeling used, where relevant;	✓
4.3.6	in the case of a linear activity, confirmation from the terrestrial biodiversity specialist that, in their opinion, based on the mitigation and remedial measures propped, the land can be returned to the current state within two years of completion of the construction phase;	✓
4.3.7	where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr;	✓
4.3.8	a description of the assumptions made and any uncertainties or gaps in knowledge or data; and	✓

4.3.9	any conditions to which this statement is subjected.	EAP
4.4	A signed copy of the compliance statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	EAP

ANIMAL SPECIES SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
1	**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 animal species must submit a **Terrestrial Animal 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 animal species must submit **either a Terrestrial Animal Species Specialist Assessment Report or a Terrestrial Animal 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 animal species must submit a **Terrestrial Animal 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 animal species sensitivity and it is found to be of a "*low*" sensitivity, then a **Terrestrial Animal 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 animal species sensitivity and it is found to be of a "*very high*" or "*high*" terrestrial animal species sensitivity, a **Terrestrial Animal 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 Animal Species Specialist Assessment** and the **Terrestrial Animal 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 the boundary of the preferred site, the *project areas of influence* (PAOI) must be determined by the specialist in accordance with *Species Environmental Assessment Guideline*[8], and the study area must include the PAOI, as determined.	✓
	VERY HIGH AND HIGH SENSITIVITY RATING for terrestrial animal species	
2	**Terrestrial Animal Species Specialist Assessment**	
	VERY HIGH SENSITIVITY RATING 1. Critical habitat for range-restricted species[9] of conservation concern, that have a global range of less than 10 km^2.	✓

[8] Available at https://bgis.sanbi.org/
[9] Species with a geographically restricted area of distribution.

	2. SCC listed on the IUCN Red List of Threatened Species[10] or on South Africa's National Red List website[11] as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria or listed as Nationally Rare. 3. Species aggregations that represent ≥1% of the global population size of a species, over a season, and during one or more key stages of its life cycle. 4. The number of mature individuals that ranks the site among the largest 10 aggregations known for the species. These areas are irreplaceable for SCC.	
	HIGH SENSITIVITY RATING 1. Confirmed habitat for SCC. 2. SCC, listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable, according to the IUCN Red List 3.1. Categories and Criteria and under the national category of Rare. These areas are unsuitable for development due to a very likely impact on SCC.	✓
2.2.12	identify any alternative development footprints within the preferred site which would be of "*low*" or "*medium*" sensitivity as identified by the screening tool and verified through the site sensitivity verification.	✓
2.3	The findings of the assessment must be written up in a **Terrestrial Animal Species Specialist Assessment Report**.	✓
3	**Terrestrial Animal Species Specialist Assessment Report**	
3.1.13	a motivation must be provided if there were any development footprints identified as per paragraph 2.2.12 above that were identified as having "*low*" or "*medium*" terrestrial animal species sensitivity and were not considered appropriate.	✓
4	**MEDIUM SENSITIVITY SPECIES OF CONSERVATION CONCERN CONFIRMATION**	
	MEDIUM SENSITIVITY RATING – for terrestrial animal species: 1. Suspected habitat for SCC based either on historical records (prior to 2002) or being a natural area included in a habitat suitability model for this species[12]. 2. SCC listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria and under the national category of Rare.	✓
4.6	Where SCC are found on site or have been confirmed to be likely present, a **Terrestrial Animal Species Specialist Assessment** must be submitted in accordance with the requirements specified for "*very high*" and "*high*" sensitivity in this protocol.	✓
4.7	Similarly, where no SCC are found on site during the site inspection or the presence is confirmed to be unlikely, a **Terrestrial Animal Species Compliance Statement** must be submitted.	✓
5	**LOW SENSITIVITY RATING – for terrestrial animal species**	
	Terrestrial Animal Species Compliance Statement 1. Areas where no natural habitat remains. 2. Natural areas where there is no suspected occurrence of SCC.	✓
5.1	The compliance statement must be prepared by a SACNASP registered specialist under one of the two fields of practice (Zoological Science or Ecological Science).	✓
5.2	The compliance statement must:	✓
5.2.1	be applicable to the study area;	✓
5.2.2	confirm that the study area, is of "*low*" sensitivity for terrestrial animal species; and	✓

[10] https://www.iucnredlist.org/
[11] This category includes the categories Extremely Rare, Critically Rare and Rare
[12] The methodology by which habitat suitability models have been developed are explained within the Species Environmental Assessment Guideline.

5.2.3	indicate whether or not the proposed development will have any impact on SCC.	✓
5.3	The compliance statement[13] must contain, as a minimum, the following information:	✓
5.3.1	contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the compliance statement including a curriculum vitae;	✓
5.3.2	a signed statement of independence by the specialist;	✓
5.3.3	a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	✓
5.3.4	a description of the methodology used to undertake the site survey and prepare the compliance statement, including equipment and modelling used where relevant;	✓
5.3.5	the mean density of observations/ number of samples sites per unit area[15].	✓
5.3.6	where required, proposed impact management actions and outcomes or any monitoring requirements for inclusion in the EMPr;	✓
5.3.7	a description of the assumptions made and any uncertainties or gaps in knowledge or data; and	✓
5.3.8	any conditions to which the compliance statement is subjected.	✓
6	A signed copy of the **Terrestrial Animal Species Compliance Statement** must be appended to the Basic Assessment Report or the Environmental Impact Assessment Report.	✓

PLANT SPECIES SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS

TABLE 1:	ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL BIODIVERSITY	REPORT REFERENCE
1	**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 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	✓

[13] An example of a what is contained in a Compliance Statement for Animal Species Impact Assessment can be found in the Species Environmental Impact Assessment Guideline

	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 the boundary of the preferred site, the *project areas of influence* (PAOI) must be determined by the specialist in accordance with *Species Environmental Assessment Guideline*[14], and the study area must include the PAOI, as determined.	✓
	VERY HIGH AND HIGH SENSITIVITY RATING for terrestrial plant species	
2	**Terrestrial Plant Species Specialist Assessment**	
	VERY HIGH SENSITIVITY RATING 1. Critical habitat for range-restricted species[15] of conservation concern, that have a global range of less than 10 km^2. 2. SCC listed on the IUCN Red List of Threatened Species[16] or on South Africa's National Red List website[17] as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria or listed as Nationally Rare. 3. Species aggregations that represent ≥1% of the global population size of a species, over a season, and during one or more key stages of its life cycle. 4. The number of mature individuals that ranks the site among the largest 10 aggregations known for the species. These areas are irreplaceable for SCC. HIGH SENSITIVITY RATING 1. Confirmed habitat for SCC. 2. SCC, listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable, according to the IUCN Red List 3.1. Categories and Criteria and under the national category of Rare. These areas are unsuitable for development due to a very likely impact on SCC.	✓
2.3.12	identify any alternative development footprints within the preferred site which would be of "*low*" 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**.	✓
3	**Terrestrial Plant Species Specialist Assessment Report**	✓
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.	✓
4	**MEDIUM SENSITIVITY SPECIES OF CONSERVATION CONCERN CONFIRMATION**	
	MEDIUM SENSITIVITY RATING – for terrestrial plant species:	
	1. Suspected habitat for SCC based either on there being records for this species collected in the past, prior to 2002, or being a natural area included in a habitat suitability model[18].	✓

[14] Available at https://bgis.sanbi.org/
[15] Species with a geographically restricted area of distribution.
[16] https://www.iucnredlist.org/
[17] This category includes the categories Extremely Rare, Critically Rare and Rare
[18] The methodology by which habitat suitability models have been developed are explained within the Species Environmental Assessment Guideline.

	2. SCC listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria and under the national category of Rare.	
4.6	Where SCC are found on site or have been confirmed to be likely present, a **Terrestrial Plant Species Specialist Assessment** must be submitted in accordance with the requirements specified for "*very high*" and "*high*" sensitivity in this protocol.	✓
4.7	Similarly, where no SCC are found on site during the site inspection or the presence is confirmed to be unlikely, a **Terrestrial Plant Species Compliance Statement** must be submitted.	✓
5	**LOW SENSITIVITY RATING – for terrestrial plant species**	
	Terrestrial Plant Species Compliance Statement 1. Areas where no natural habitat remains. 2. Natural areas where there is no suspected occurrence of SCC.	✓
5.1	The compliance statement must be prepared by a SACNASP registered specialist under one of the two fields of practice (Botanical Science or Ecological Science).	✓
5.2	The compliance statement must:	✓
5.2.1	be applicable to the study area;	✓
5.2.2	confirm that the study area, is of "*low*" sensitivity for terrestrial plant species; and	✓
5.2.3	indicate whether or not the proposed development will have any impact on SCC.	✓
5.3	The compliance statement[19] must contain, as a minimum, the following information:	✓
5.3.1	contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the compliance statement including a curriculum vitae;	✓
5.3.2	a signed statement of independence by the specialist;	✓
5.3.3	a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	✓
5.3.4	a description of the methodology used to undertake the site survey and prepare the compliance statement, including equipment and modelling used where relevant;	✓
5.3.5	where required, proposed impact management actions and outcomes or any monitoring requirements for inclusion in the EMPr;	✓
5.3.6	a description of the assumptions made and any uncertainties or gaps in knowledge or data;	✓
5.3.7	the mean density of observations/ number of samples sites per unit area[20]; and	✓
5.3.8	any conditions to which the compliance statement is subjected.	✓
6	A signed copy of the **Terrestrial Plant Species Compliance Statement** must be appended to the Basic Assessment Report or the Environmental Impact Assessment Report.	✓

[19] An example of a what is contained in a Compliance Statement for Plant Species Impact Assessment can be found in the Species Environmental Impact Assessment Guideline

[20] Refer to the Species Environmental Assessment Guideline

8.7 Site Sensitivity Verification Report

8.7.1 Background

Sharples Environmental Services cc (SES) has been appointed as the independent Environmental Assessment Practitioner (EAP) to conduct the Environmental Assessments for the Proposed additions and alterations on Erf 10190, situated in Salmack Rd, Plettenberg Bay, Bitou, Western Cape (Figure 43). As part of this application, a Terrestrial Biodiversity & Plant Specialist Assessment is required. The site is a developed residential Erf, however due to proximity to both the sea and the Keurbooms Estuary, a basic assessment application process is triggered. As part of this process, a terrestrial biodiversity assessment is required to support the necessary environmental applications.

Figure 43: Site locality.

8.7.2 Activity Location and Description

The site is situated within a transformed developed suburb and is situated specifically on the western edge of the Keurbooms River estuary within what would have previously been a dune thicket vegetated area on the banks of the estuary. The eastern side of the site falls within the estuary itself and is prone to being eroded as the estuary is constantly migrating in an east-west direction. The western side of the site has been stabilised with rocks to protect the buildings from erosion due to flooding and tidal movement within the estuary.

The development proposal includes additions and alterations to the existing buildings as well as construction of both internal and public parking bays and public ablution facilities to service visitors to the adjacent public beach. Two alternative site development plans are proposed (Figure 44 & Figure 45).

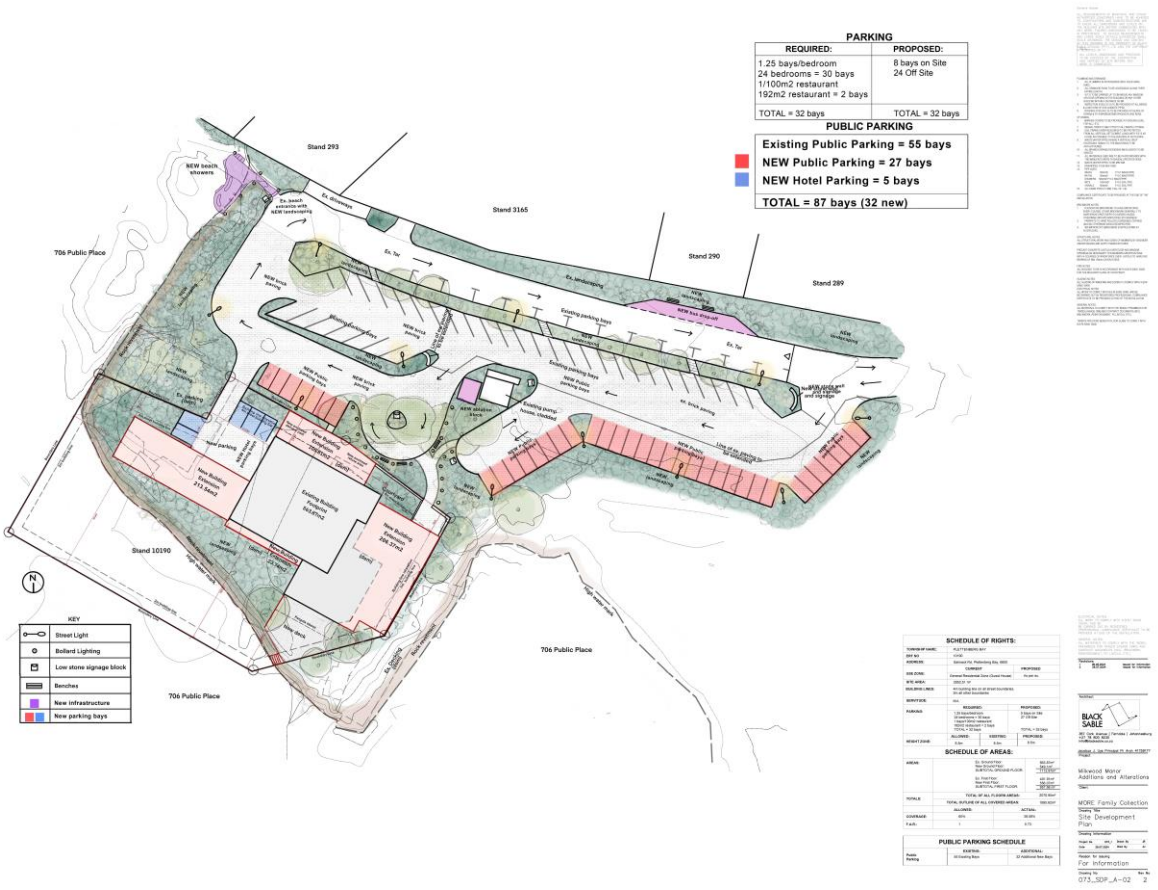

Figure 44: Preferred Site Development Plan.

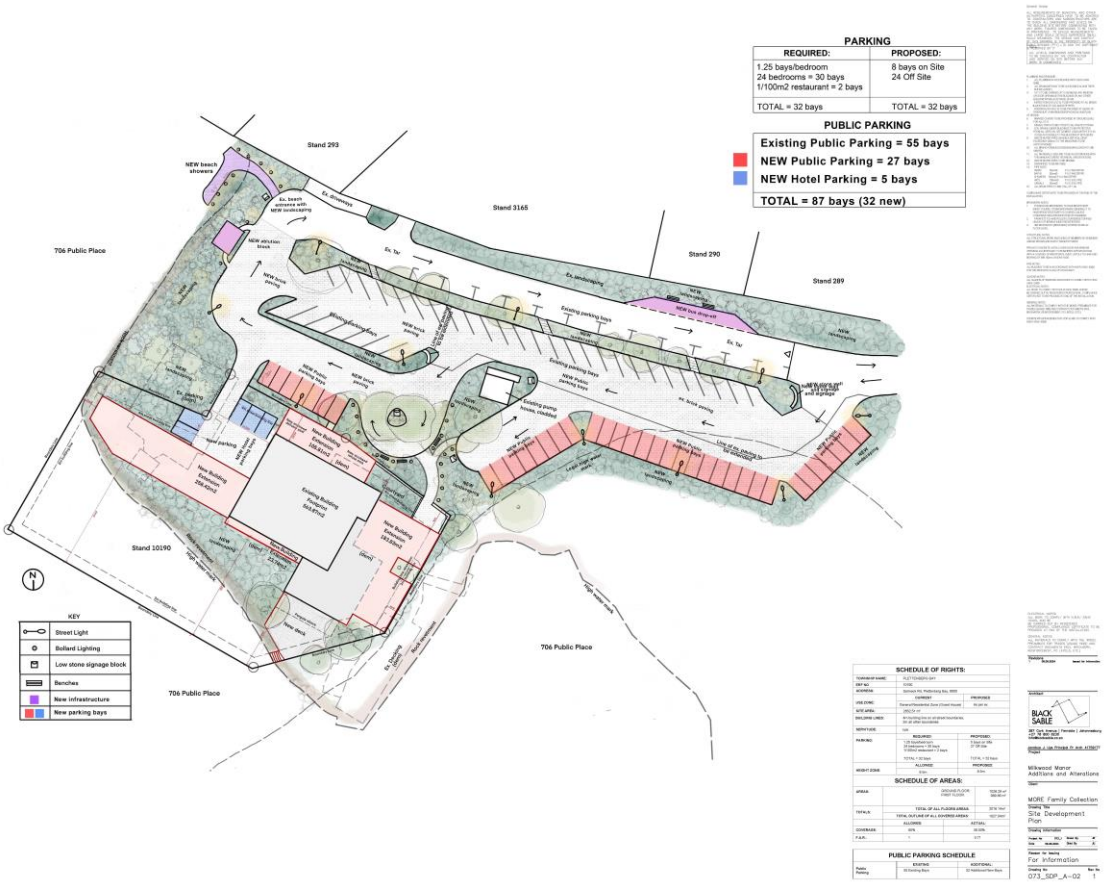

Figure 45: Alternative Site Development Plan.

8.7.3 Purpose of Report

The "*Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of sections 24 (5) (a) and (h) and 44 of the Act, when applying for Environmental Authorisation*", as published on 20 March, 2020 in National Gazette, No. 43110 in terms of NEMA (Act 107 of 1998) sections 24(5)(a), (h) and 44, lists protocols and minimum report requirements for environmental impacts on terrestrial biodiversity and provides the criteria for the assessment and reporting of impacts on terrestrial biodiversity for activities requiring environmental authorisation. The assessment and minimum reporting requirements of this protocol are associated with a level of environmental sensitivity identified by the National web based Environmental Screening Tool. Prior to commencing with a specialist assessment, the current use of the land and the environmental sensitivity of the site under consideration, identified by the screening tool, must be confirmed by undertaking a **site sensitivity verification**, which must include the following.

4. The site sensitivity verification must be undertaken by an environmental assessment practitioner or a specialist.
5. The site sensitivity verification must be undertaken through the use of:
    a. a desk top analysis, using satellite imagery.
    b. a preliminary on -site inspection; and
    c. any other available and relevant information.
6. The outcome of the site sensitivity verification must be recorded in the form of a report that:
    a. confirms or disputes the current use of the land and environmental sensitivity as identified by the screening tool.
    b. contains a motivation and evidence of either the verified or different use of the land and environmental sensitivity; and
    c. is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations.

The National Web Based Screening Tool was used to generate the potential environmental sensitivity of the site which has then been compared to various online and other databases and information sources in order to verify and confirm the validity of the screening tool findings. This was further supported with on-site observations and analysis of most recent aerial photography.

This terrestrial biodiversity site verification has been undertaken as per the requirements of the Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for environmental authorisation (GN 320, 20 March 2020).

8.7.4 Data sources and references

Data sources that were utilised for this report include the following:

- National (DFFE) Web Based Screening Tool – to generate the sites potential environmental sensitivity.
- National Vegetation Map 2018 (NVM, 2018), Mucina & Rutherford (2006) and National Biodiversity Assessment or Red Listed Ecosystems (NBA/RLE, 2022) – description of vegetation types, species (including endemic) and most recent vegetation unit conservation status.
- National and Regional Legislation including Provincial Nature Conservation Ordinance (P.N.C.O). NEM:BA Threatened or Protected Species (ToPS).
- Botanical Database of Southern Africa (BODATSA) and New Plants of Southern Africa (POSA) – lists of plant species and potential species of concern found in the general area (SANBI.)
- International Union for Conservation of Nature (IUCN) - Red List of Threatened Species.
- Animal Demography Unit Virtual Museum (VM) – potential faunal species.

- Global Biodiversity Information Facility (GBIF) – potential flora & faunal species.
- National Red Books and Lists - mammals, reptiles, frogs, dragonflies & butterflies.
- National Freshwater Ecosystem Priority Areas assessment (NFEPA, 2011) - important catchments.
- National Protected Areas Expansion Strategy (NPAES, 2018) and South Africa Protected Area database (2020) – protected area information.
- SANBI BGIS – All other biodiversity GIS datasets.
- Western Cape Biodiversity Spatial Plan (2017).
- Aerial Imagery – Google Earth, ESRI, Chief Surveyor General (http://csg.dla.gov.za).
- Cadastral and other topographical country data - Chief Surveyor General (http://csg.dla.gov.za).
- Other sources may include peer-reviewed journals, regional and local assessments, and studies in the general location of the project and its area of influence, landscape prioritization schemes (Key Biodiversity Areas), systematic conservation planning assessments and plans (as above), and any pertinent masters and doctoral theses, among others.

This terrestrial biodiversity assessment has been undertaken as per the requirements of the Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for environmental authorisation (GN 320, 20 March 2020).

8.7.5 Site visit

A site inspection was conducted on **23 July 2024**, during mid-winter. The site falls within a temperate climate with rainfall occurring throughout the year but is often higher in winter, hence for the purposes of this report, a single site visit is deemed to be adequate, specifically due to the disturbed nature of the site where the proposed development is within a developed Erf.

8.7.6 Assumptions, Uncertainties and Gaps in Knowledge

The findings and recommendations of this report may be susceptible to the following uncertainties and limitation:

- No assessment has been made of aquatic or estuarine aspects relating to any wetlands, pans, and rivers/seeps and/or estuaries or marine ecosystems outside of the scope of a terrestrial biodiversity report. Refer to separate reporting.
- Any botanical surveys based upon a limited sampling time-period, may not reflect the actual species composition of the site due to seasonal variations in flowering times. Additionally, the composition of fire adapted vegetation may vary depending on level of maturity or time since last burn. As far as possible, site collected data has been supplemented with desktop and database-centred distribution data.
- As far as possible, site collected data has been supplemented with desktop and database-centred distribution data as well as previous studies undertaken in the area.

8.7.7 National Environmental Screening Tool

The DEA Screening Tool indicates the following, summarised in Table 9 :

- Terrestrial Biodiversity is Very High (Figure 46).
- Plant species sensitivity is Low & Moderate (Figure 47).
- Animal Species sensitivity is High (Figure 48).
- Aquatic Sensitivity is Very High (Figure 49).

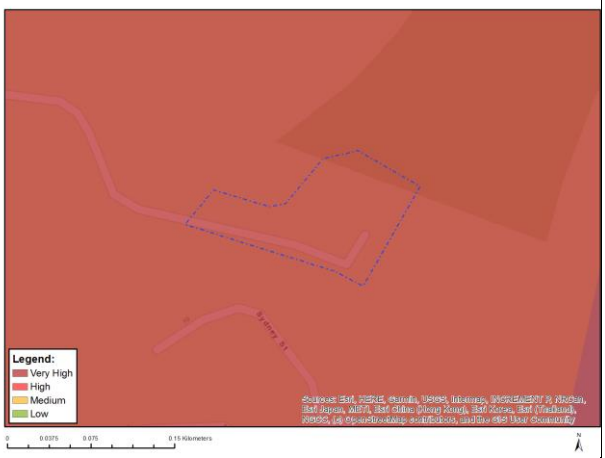

Figure 46: Terrestrial Biodiversity Sensitivity

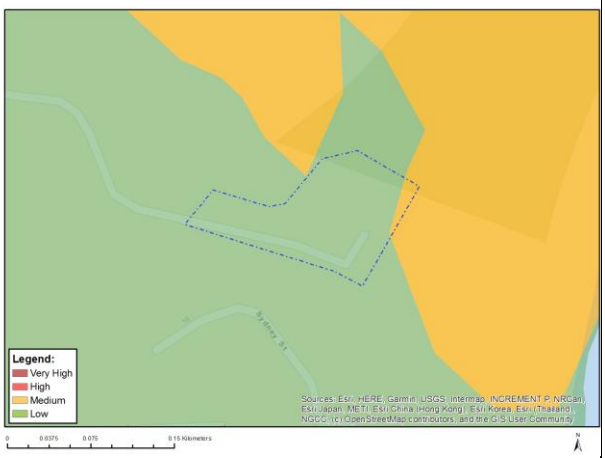

Figure 47: Plant Species Sensitivity

Figure 48: Animal Species Sensitivity

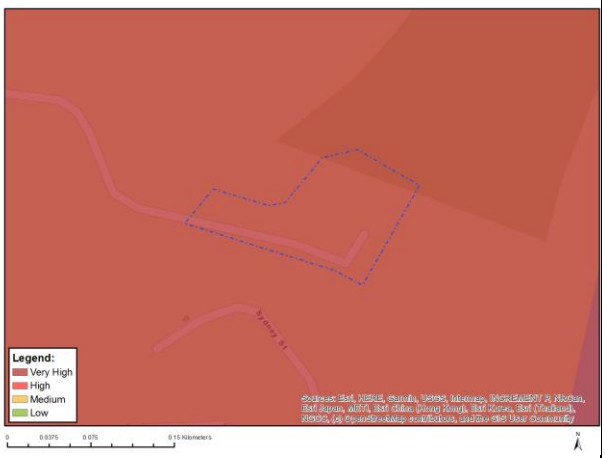

Figure 49: Aquatic Sensitivity

Table 9: Summary of Screening tool designations.

Terrestrial Sensitivity	**Feature(s) in proximity**
Very High	CBA 1: Terrestrial, FEPA Sub-catchment, National Protected Area Expansion Strategy (NPAES) & SANParks Buffer (Garden Route National Park)
High	None
Medium	None
Low	Present
Plant Sensitivity	
Very High	None
High	None
Medium	*Lampranthus pauciflorus, Lebeckia gracilis, Erica chloroloma, Erica glandulosa subsp. fourcadei, Hermannia lavandulifolia, Cotula myriophylloides, Acmadenia alternifolia, Muraltia knysnaensis, Erica glumiflora, Zostera capensis,* Sensitive species 657, 1032, 800, 500 & 763.
Low	Present
Animal Sensitivity	
Very High	None
High	*Circus ranivorus, Hydroprogne caspia, Neotis denhami, Bradypterus sylvaticus* & *Polemaetus bellicosus* (Birds)
Medium	*Afrixalus knysnae* (Amphibian), *Chlorotalpa duthieae*, Sensitive species 8 (Mammal), *Sarophorus punctatus* & *Aneuryphymus montanus* (Insects)

Low	Present
Aquatic Sensitivity	
Very High	CBA 1, Estuary (Keurbooms), FEPA Sub-catchment, Wetlands (Estuary)
High	None
Medium	None
Low	None

The site assessment will also physically screen for the presence of the listed, and other possible species and/or sensitivities that are not identified in the screening tool in addition to those that are flagged. Not all features are directly affected, but being in proximity, the risks associated with the activity will be investigated further and addressed in the report.

The following is deduced from the DFFE National Environmental Screening Tool:

- The terrestrial biodiversity theme is Very-High due to the site being within or on the edge of a designated CBA 1 and Protected Area. The Very High sensitivity designation is thus disputed as the entire site is situated on the edge of an urban area and is a developed Erf with landscaped and hardened surfaces and/or landscaped gardens with some remnant thicket elements only and should thus not be designated as CBA or Protected Area as restoration to a natural context within any timeframe is not likely without complete removal of the development.
- Several flora (plant) species regarded as being of concern are flagged as potentially being present (Medium sensitivity) and are assessed further in the report, however none were found to be present during the site visit and are furthermore due to the transformed nature of the site, it is not deemed to be suitable habitat for any functional species population. The Medium sensitivity designation is thus disputed as the site, which is situated on the edge of an urban area, is within a developed Erf that is landscaped and has hardened surfaces (parking) and/or landscaped gardens with only some remnant thicket elements that have limited ecological function.
- Several fauna (animal) species regarded as being of concern are flagged as potentially being present (High sensitivity) and are assessed further in the report. Due to the limited size of the site and transformed nature of the surrounding landscape, the site would not be deemed to be viable for any species population. The High sensitivity designation is thus disputed as the site, which is situated on the edge of an urban area, is within a developed Erf that is landscaped and has hardened surfaces (parking) and/or landscaped gardens with only some remnant thicket elements that have limited ecological function nor provide suitable habitat other than for temporarily transient fauna species (i.e. such as perching in a tree).
- The aquatic sensitivity is Very High due to falling within designated CBA 1, Estuary (Keurbooms), and Wetlands (Estuary). While the site is adjacent to this Estuary, the Very High sensitivity designation is thus disputed as the site, in particular the development footprint, is situated within a landscaped developed urban Erf, which is transformed due to historical urban development and should thus not be designated as CBA. A small portion of the erf does fall within the estuary but is excluded from the proposed development activities, which will occur within the terrestrial area.
- The impacts are assessed further in the relevant report sections in the accompanying report.

8.7.8 Findings, Outcomes and Recommendations

Terrestrial Biodiversity

Site verification of the Terrestrial Biodiversity sensitivities is summarised in Table 10 and depicted in *Figure 50*, where CBA is light green and Protected Area is dark green. The CBA and Protected area designation are associated with feature adjacent to the site and/or outside of the proposed development/activity footprint.

Table 10: Terrestrial Biodiversity Features flagged in the National Environmental Screening Tool.

Feature		COMMENT
Critical Biodiversity Area	CBA 1	**Dispute** – the site is within a developed erf which is landscaped and having nominal natural vegetation, comprising a few Milkwood trees and some remnant dune thicket elements that may have been retained during site clearing, or they have been reintroduced in a secondary context (dune thicket pocket at beach parking access point).
Protected Area		

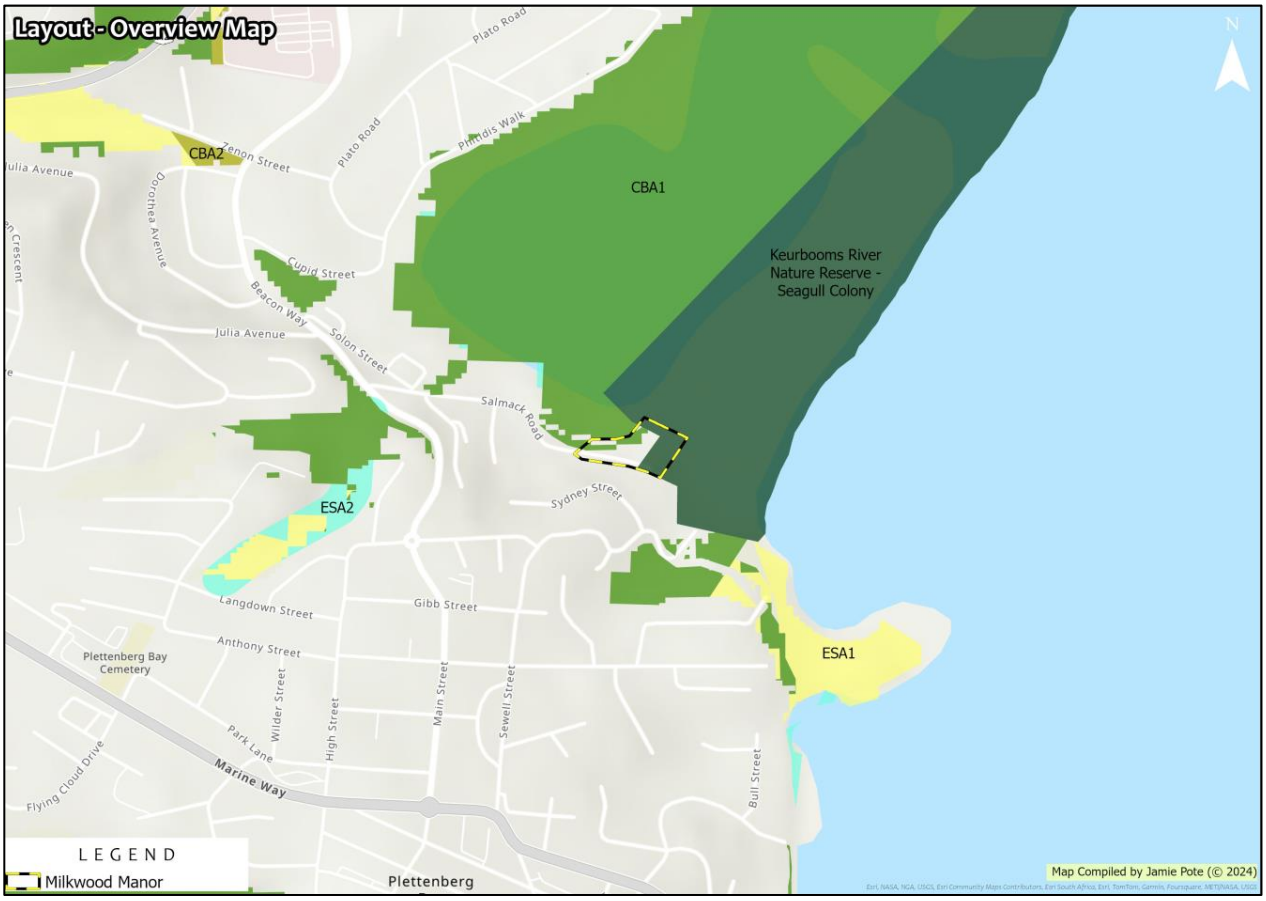

Figure 50: Western Cape Biodiversity Spatial Plan (2017) – site does partially overlap with CBA and Protected Area designations.

Plant Species (Flora)

National Environmental Screening Tool flagged several flora species. Almost the entire site is situated within a landscaped garden where little natural vegetation remains. A few small pockets of natural vegetation do remain, primarily as Milkwood trees with some associated dune thicket elements, where retained within or on the edge of the developed Erf. Any such pockets were checked for flora species of conservation concern, and it is confirmed that no species of conservation concern having an elevated status and/or limited distribution range as flagged in the screening tool are present.

The SSVR thus disputes the flagged flora ('plant') species of conservation concern and medium plant species designations.

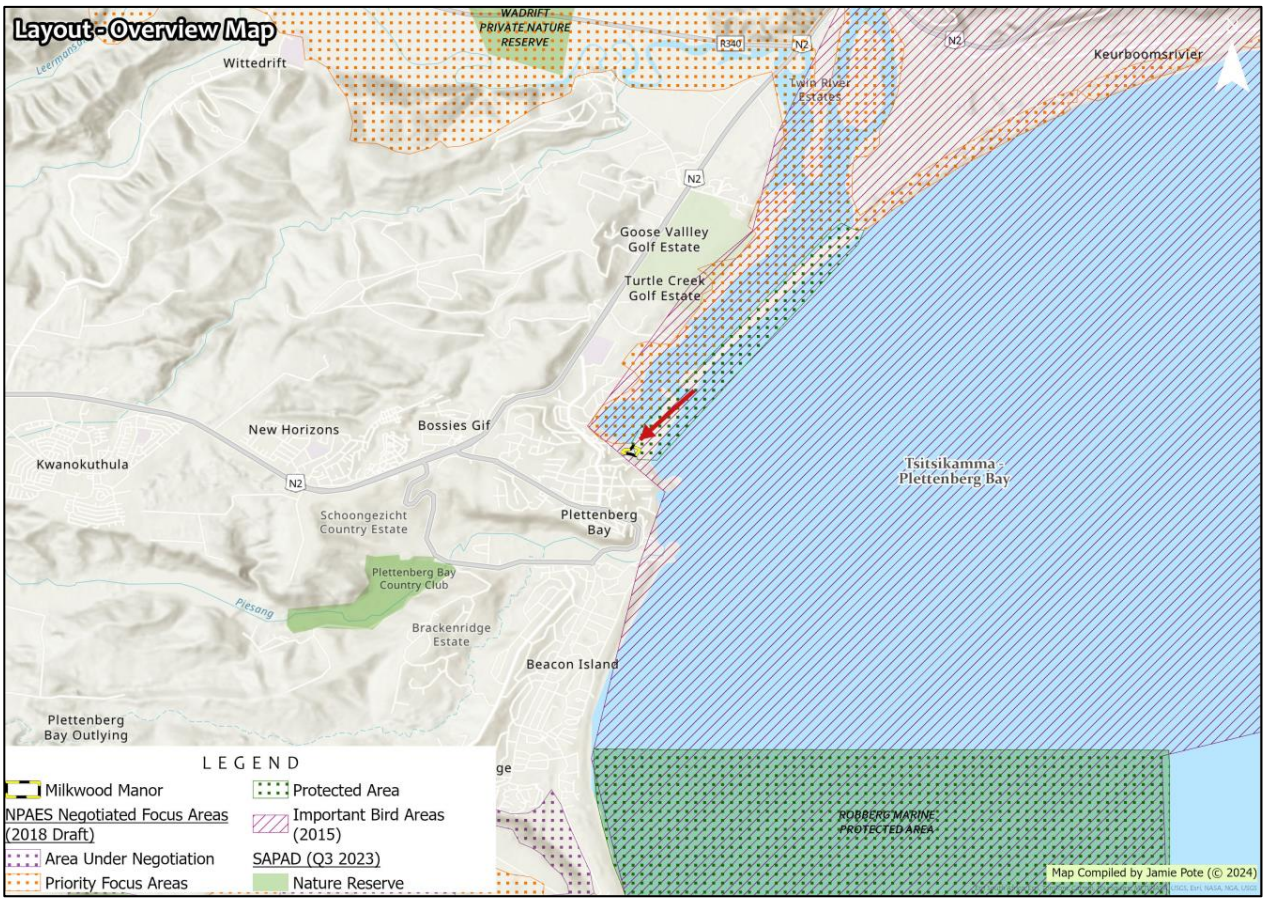

Figure 51: Protected Areas and NPAES in vicinity.

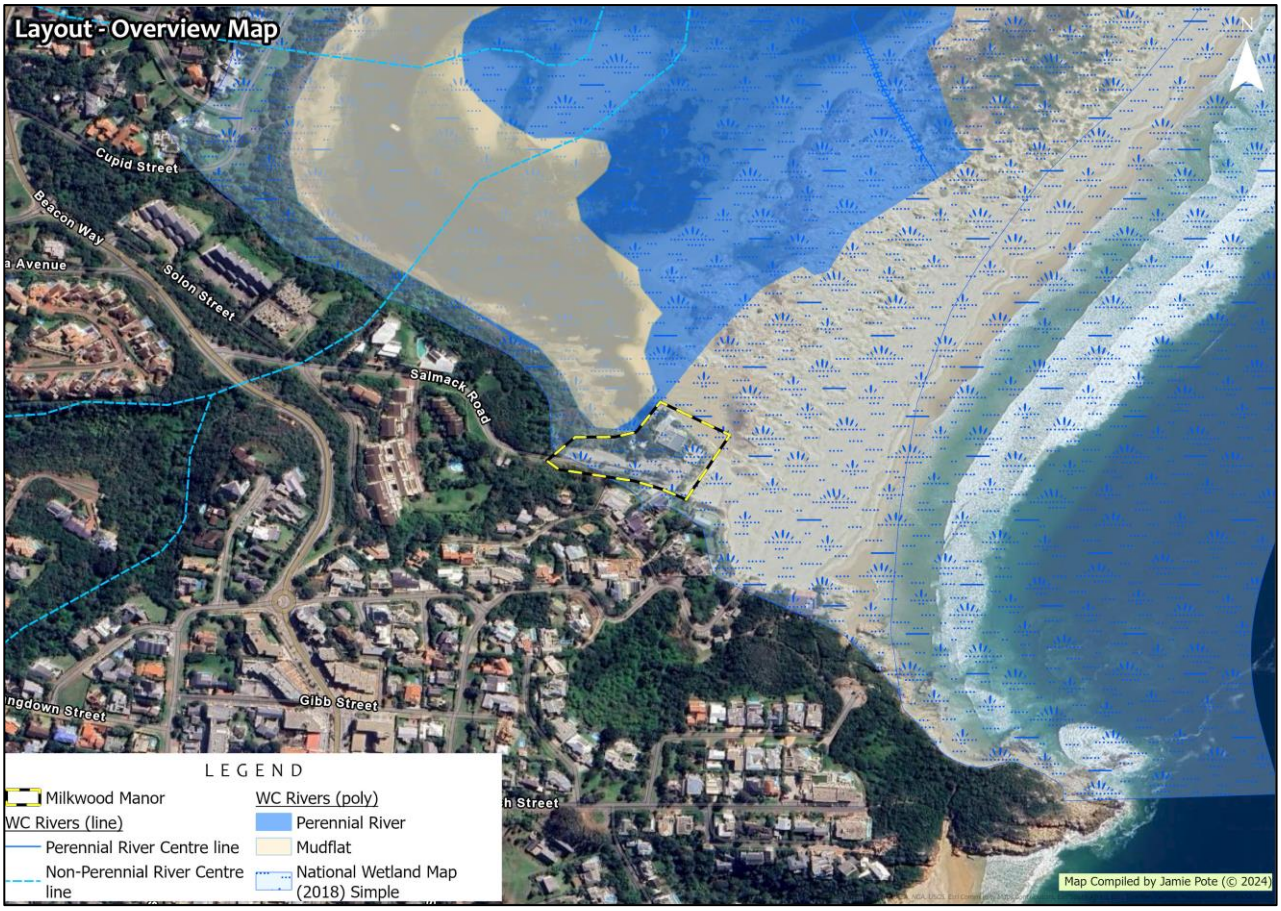

Figure 52: Rivers, FEPAs & SWSA's.

Animal Species (Fauna)

National Environmental Screening Tool flagged several flora species. Almost the entire site is situated within a landscaped garden where little natural vegetation remains. A few small pockets of natural vegetation do remain, primarily as Milkwood trees with some associated dune thicket elements, where retained within or on the edge of the developed Erf. Any such pockets were checked for fauna species of conservation concern, and it is confirmed that no species of conservation concern having an elevated status and/or limited distribution range as flagged in the screening tool are present.

The broader area is known to provide refuge and habitat for Sensitive Species 8. While the species is generally shy, it is occasionally observed in quiet urban settings that are in proximity to its habitat. The species may thus occasionally be seen in the broader area but the proposed activity, is unlikely to pose a risk to this species, were it to occur or be a transient visitor. Standard measures of checking open trenches, in particular after rain and not leaving trenches open for extended time periods would be advisable as a precautionary measure, however the species would likely be able to escape all but the deepest of trenches. It is also unlikely that this species would favour the more densely populated areas, however the site is adjacent to some less developed vegetated patches where it is feasible the species could pass while in transit.

The flagged Avifauna (bird) species *Bradypterus sylvaticus* (Knysna warbler), could in principle occasionally perch in the Milkwood trees if present and foraging in the surround area, but is unlikely to be affected above any baseline disturbances. The remaining flagged Avifauna (bird) species would be associated with the adjacent dune and/or estuarine environments and/or unpopulated areas and thus the site is unlikely to provide suitable habitat. If present occasionally, it would suggest that the individuals are somewhat acclimatised to a peri-urban environment and would also not be significantly affected.

The SSVR thus disputes the flagged fauna ('animal') species of conservation concern designations and High animal species designations.

Aquatic

Wetland and River features are present in the broader area, including the Keurbooms River estuary. Aquatic aspects are beyond the scope of this Terrestrial Biodiversity assessment but is given consideration in terms of terrestrial processes that may be influenced by the nearby aquatic estuarine component.

8.7.9 Conclusions

The site verification thus confirms that the site does not fall within the terrestrial biodiversity screening tool designated CBA or Protected Area as the site is almost entirely transformed as the footprint is within a landscaped developed werf with only a few remnant Milkwood trees and some remnant dune thicket elements, which will have limited ecological function.

It further disputes that any of the screening tool flagged flora or fauna species of conservation concern are likely to be affected by the proposed activity within a transformed and landscape Erf.

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