Botanical Impact Assessment

Proposed housing development on Portion 9 of Farm Oude Brug 313, Grabouw

June 2025

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Mark Berry is an independent botanical specialist with over 25 years of experience mainly in the Western Cape, but also in the adjacent provinces, Free State and KwaZulu-Natal. He is also experienced in undertaking/compiling Environmental Impact Assessments (EIA's), Environmental Management Programmes (EMPr's), Environmental Control Officer (ECO) duties, audits, land use surveys and due diligence investigations. CV is available upon request.

Citation of report

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Declaration of Independence

I Mark Gerald Berry, as the appointed Specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- 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 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;
- 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
- am aware that a false declaration is an offence in terms of Regulation 48 of the EIA Regulations, 2014 (as amended).

Signature of the Specialist:	
Name of Company:	MB Botanical Surveys
Date:	27 June 2025

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1. Introduction

Proposed development and area assessed

The applicant (Theewaterskloof Municipality) is investigating an affordable (subsidy) housing development opportunity on Portion 9 of Farm Oude Brug 313, located on the southern side of Grabouw (**Figure 1-1**). The site, which is situated between the N2 and Snake Park township, is mainly covered by a sports field, grasses, herbaceous weeds and invasive species. The proposed development comprises 254 single residential erven, streets/public roads, municipal infrastructure and open space (**Figure 1-3**). The current layout considered the nearby presence of medium to good quality fynbos and a watercourse as previously identified by specialists.

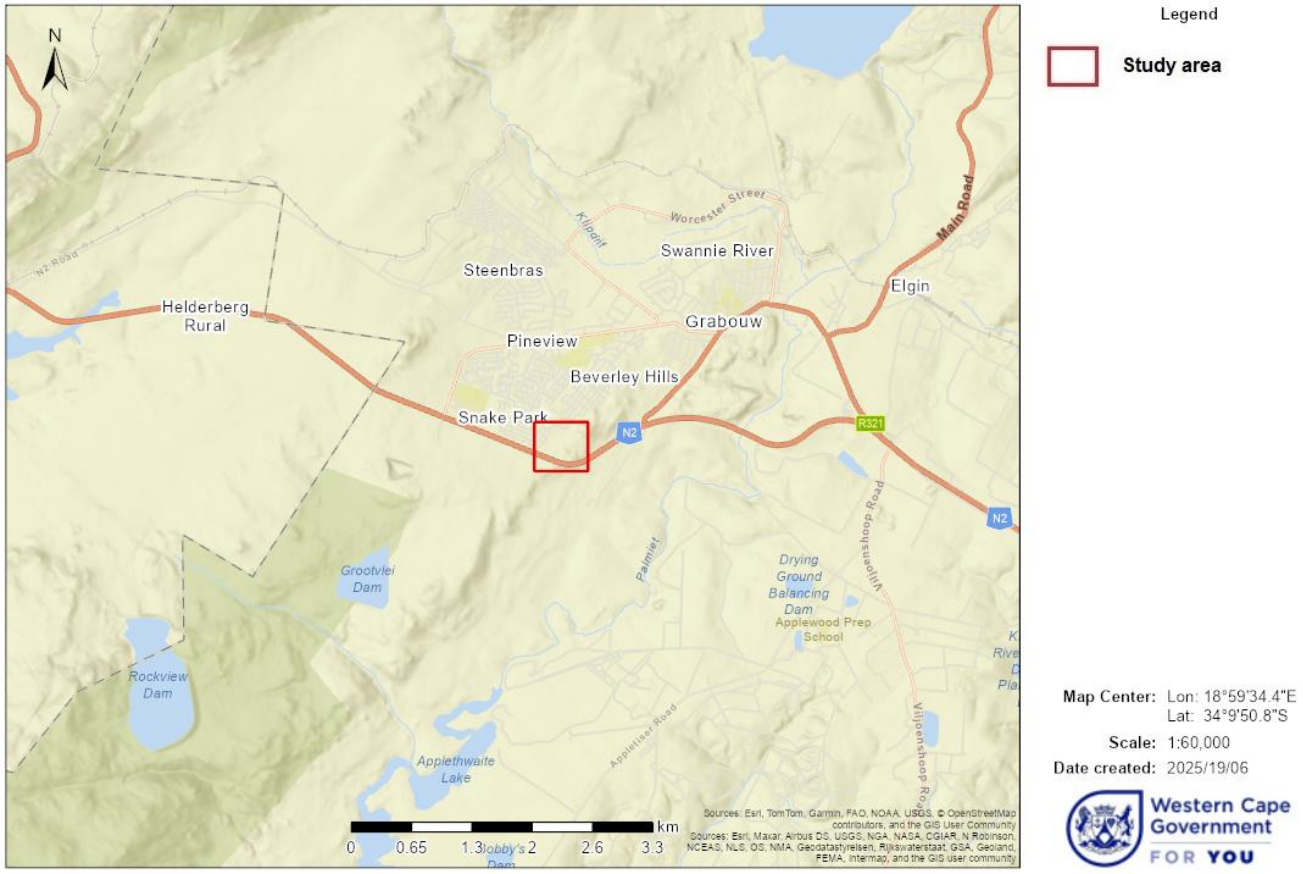

Figure 1-1: Location of the study site.

According to the Screening Report, generated by the EAP (Engineering Advice & Services) on 30 January 2025, the site is located inside an area mapped as Medium sensitive in the plant species theme. With regards to the terrestrial biodiversity theme, it has been mapped as Very High sensitive. The Very High sensitivity is ascribed to the possible presence of, among other, a threatened ecosystem and the encroachment of the site on the biodiversity network (ESA). As a result, MB Botanical Surveys was contracted to undertake a botanical survey of the site.

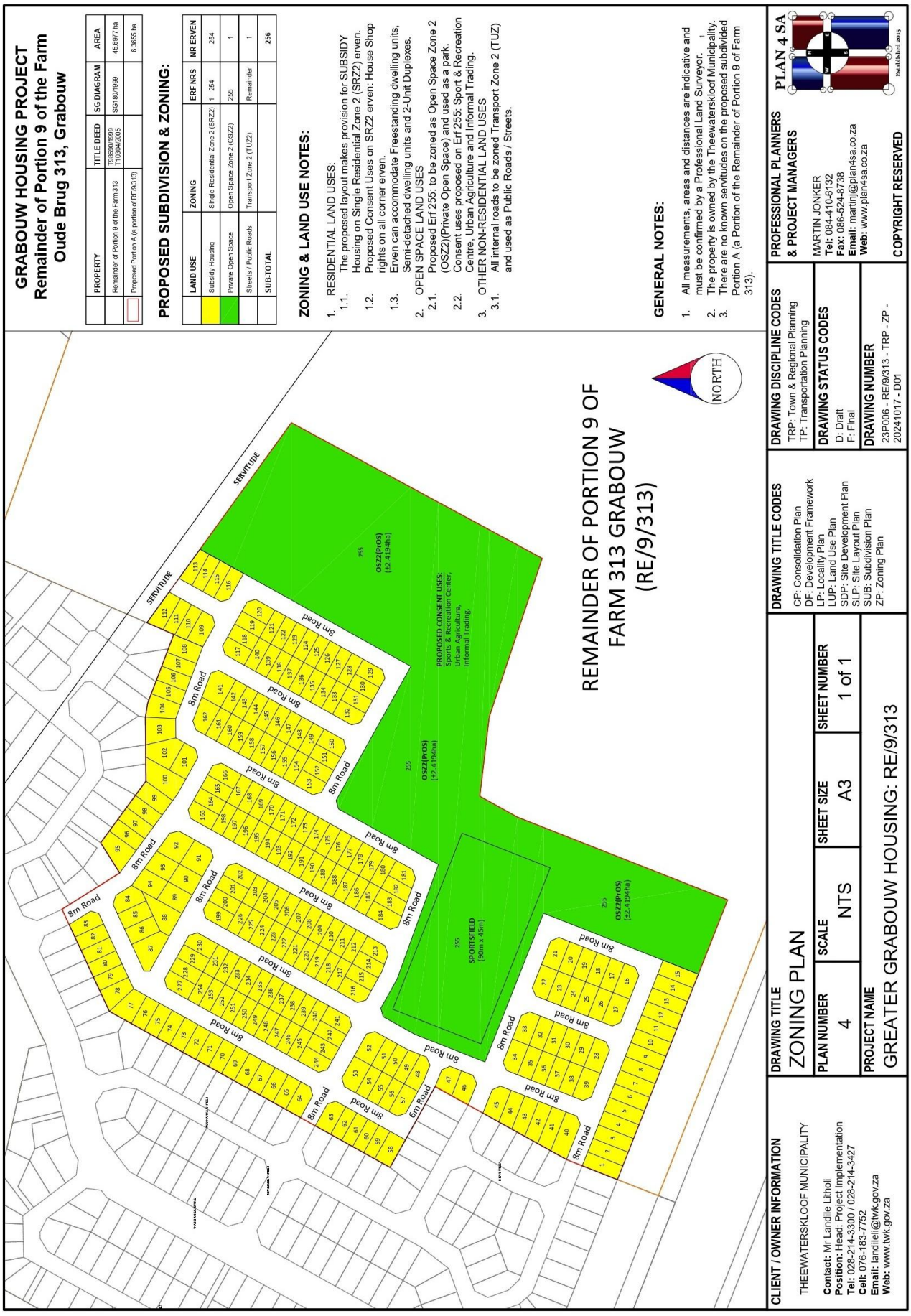

Figure 1-2: Proposed rezoning and subdivision map.

Terms of Reference

The terms of reference agreed upon for this botanical study include:

- Adhere to the EAP's terms of reference for the study, namely a botanical impact statement to determine the botanical constraints of the site, which will inform development planning;
- Identify and describe biodiversity patterns at a community and ecosystem level (main vegetation type, plant communities and threatened/vulnerable ecosystems), at species level (Species of Conservation Concern) and in terms of significant landscape features;
- Describe the sensitivity of the site and its immediate surroundings;
- Map or describe the presence of invasive alien plants;
- Review the relevant biodiversity plans compiled in terms of the National Environmental Management Biodiversity Act (Act 10 of 2004);
- Make recommendations with regards to the protection of biodiversity; and
- Adhere to the NEMA and CapeNature guidelines/protocols for biodiversity assessments.

Limitations and Assumptions

The following limitations and assumptions apply to the study:

- Since fieldwork was carried out towards the end of the winter season, flowering plants that only flower at other times of the year (e.g. spring to summer), such as certain bulbs (Iridaceae & Orchidaceae), may have been missed. The overall confidence in the accuracy and completeness of the botanical findings is however considered to be good.
- The fieldwork was previously undertaken for a much larger area as part of a botanical constraints survey. It was therefore not deemed necessary to do a follow-up survey. However, there may be inaccuracies with regards to the species recorded here.

Notwithstanding the above limitations and the fact that the site is highly degraded or transformed, the specialist is of the opinion that the survey and findings are adequate to aid decision making.

Disclaimer & Use of this report

Any person using or referring to this report, do so at their own risk. The author will not accept liability for any loss or damage arising from this report or its content. This report reflects the professional judgment of its author. The information and recommendations presented are specific to the project and site at hand and do not extend to future developments or neighbouring sites. Use of this report is therefore restricted.

2. Site Sensitivity Verification

The Department of Environmental Affairs online Environmental Screening Tool indicates that the plant species theme is of Medium sensitivity for the site. **Annexure 1** lists the threatened species and their sensitivity from the Screening Report. The Screening Report further indicates that the terrestrial biodiversity theme is of Very High sensitivity for the site. This rating is ascribed to the possible presence of an ecological support areas (ESA1), a strategic water source area (surface water) and a threatened ecosystem (i.e. Kogelberg Sandstone Fynbos).

In circumstances where the *status quo* assessment proves the contrary to the above (i.e. where the site is deemed to be of Low sensitivity in respect of both themes, the GN320 of 2020 requires that a Terrestrial Biodiversity Compliance Statement is submitted as set out by the National Environmental Management Act (NEMA) (Act No. 107 of 1998) Regulations of 2020 (as amended). If the above is confirmed, then a biodiversity assessment will be required for the project.

3. Methodology

The methodology used in this terrestrial biodiversity assessment, including a desktop background assessment and one site visit, is outlined in the subsections below.

Desktop assessment

A brief review of online (e.g. Google Earth, iNaturalist.org & Cape Farm Mapper) and desktop resources (available literature & reports) was undertaken to determine the nature of the site, the expected vegetation type(s), the presence of natural vegetation remnants and species of conservation concern (SCC), hydrological features, and the significance of the site in terms of biodiversity planning.

Site survey

A botanical survey of the site was undertaken on 1 August 2022 by the author. The 2022 survey was for a botanical constraints report for a larger study area, but which included this site. A qualitative assessment of the type and condition of affected vegetation on site, disturbances and presence of alien species, SCC and protected tree species was carried out. The path walked during the survey is shown in **Figure 3-1**. Plant species not identified in the field, were collected and/or photographed and identified at the office and Compton (Kirstenbosch) Herbarium. The 2018 South African Vegetation Map and the latest floristic taxonomic literature and reference books were used for the purpose of this specialist study. Any plants classified as rare or endangered in the Red List of South African Plants

online database[1] are highlighted. The assessment follows the relevant national guidelines or protocols for biodiversity assessments as listed in the Government Gazette No. 43110 on 20 March 2020.

Figure 3-1: Satellite photo showing the 2022 survey track on site.

The following information was recorded during the site visit:

1. The condition of the vegetation. Is the vegetation either disturbed or degraded? A disturbed or degraded area could range from agricultural fields (fallow land), or areas previously disturbed by mining activities, to an area that has been severely eroded or degraded as a result of bad land management or alien infestation.
2. Species diversity (alpha diversity). This refers to the numbers of different indigenous plant species occurring on site.
3. Species of Conservation Concern (SCC), endemics, as well as protected tree species occurring on site. This would include near threatened, rare, vulnerable, endangered or critically endangered species. SCC and protected tree species were mapped using Easy GPS v2.5 software on an iPhone. Accuracy is given as ±4 m.
4. Identification of the vegetation type(s) and communities (if discernible) on the site. This would include trying to establish the known range of a vegetation type and whether or not this vegetation type is vulnerable, endangered or critically

[1] Threatened Species Programme | SANBI Red List of South African Plants

endangered.

5. Connectivity with (or isolation from) nearby natural vegetation.

Data analysis

Site ecological importance (SEI) of the affected (receptor) area has been determined by applying the criteria described in the Species Environmental Assessment Guideline (SANBI, 2020). See **Annexure 2** for a description of the SEI methodology.

4. Literature Study

A desktop literature review was undertaken during the study using both online resources and existing maps and reports. A summary of the most relevant information to this assessment is presented below. Some of the information was ground-truthed during the site survey. Most of the baseline information was obtained from the botanical *status quo* report for Portion 9 of Farm Oude Brug 313, Erf 4233 and Erf 8078 (Berry, 2022).

Location, topography & land use

The site is located in Grabouw, which is the commercial centre for Elgin Valley and the largest single export fruit-producing area in Southern Africa[2]. The latter stretches between the Hottentots-Holland, Kogelberg, Groenland and Houwhoek Mountains. The town's economy is based on servicing the surrounding agricultural industry. The landscape to the north is dominated by the Hottentots-Holland and Groenland Mountains, while the Kogelberg is located to the south. The site itself is flat or mildly sloped, with the area to the east hilly or rocky (**Figures 4-1** & **4-2**). The site is occupied by a sports field, livestock pens and housing (**Figures 4-3** & **4-4**). The rest of the site is lying vacant, but with considerable disturbances such as footpaths crisscrossing the area and waste dumping (**Figure 4-5**). The site is bordered by a township on the northern and western sides, degraded fynbos on the eastern side and the N2 on southern side.

Hydrology

According to Cape Farm Mapper, there are no mapped watercourses or wetlands on the site. The closest NFEPA (National Freshwater Ecosystem Priority Area) wetland, associated with the Palmiet River, is located 400 m away to the south of the site. There are, however, a few degraded drainage lines or ditches present, one of which springs from the adjacent township area.

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2 Grabouw - Wikipedia

Figure 4-1: Topography map.

Figure 4-2: Rocky area east of the site.

Figure 4-3: Sports field and degraded western part of site.

Figure 4-4: Livestock pen in the eastern part of site.

Figure 4-5: Footpath and dumped waste.

Climate

The mean annual rainfall for the site is 961 mm (as per Cape Farm Mapper climatic data for 1950 to 2000). The study site lies inside the winter rainfall region of the Western Cape. The peak rainfall period is from May to August (winter months), while the summer months of December to February are the driest (on average below 25 mm per month). Strong summer south-easterly winds can sometimes bring rain. Mean monthly maximum and minimum temperatures are 26.0°C and 5.3°C for February and July, respectively (as per Cape Farm Mapper data). Frost incidence is about 4 days per annum. The Köppen-Geiger climate classification for the area is Csb (temperate, dry & warm summer). The Elgin Valley is South Africa's coolest climate wine-growing region and a range of geographic factors have created a unique set of conditions for wine growing[3].

Geology & Soils

According to the 3318 Cape Town and 3319 Worcester 1:250 000 geological maps, the study site is underlain by Table Mountain Group (Rietvlei Formation) sediments. The

[3] Grabouw - Wikipedia

Rietvlei Formation comprises light-grey, well-bedded quartzitic/feldspathic sandstone, subordinate siltstone and shale. The formation is typically trough cross-bedded, with current ripples and thin pebbly lenses occasionally present (Gresse, 1992). The substrate comprises acidic lithosol soils (Mucina, 2006). Deep sandy blankets (whitish, nutrient-poor acidic sand) develop in the depressions and on slopes resisting erosion (Mucina, 2006). Table Mountain Group sediments typically support sandstone fynbos types.

Vegetation Type & Biodiversity Planning Context

According to the 2018 SA Vegetation Map, the site lies inside Kogelberg Sandstone Fynbos (**Figure 4-6**). Almost nothing of this vegetation type remains on site as the area is highly degraded or transformed. Kogelberg Sandstone Fynbos stretches over the mountains from Franschhoek and Stellenbosch in the north southwards to Cape Hangklip and Kleinmond (Mucina, 2006). The landscape is mountainous and hilly, with prominent river valleys. The vegetation itself can be described as a moderately tall, dense ericoid shrubland, with scattered emergent tall shrubs (Mucina, 2006). The Kogelberg area to the south of Grabouw is of exceptional conservation significance. It is regarded as the floristic heart of the globally unique Cape Floral Kingdom since it has the highest levels of plant species richness and endemism in the fynbos biome. More than 1850 plant species are estimated to occur in the Kogelberg area of which around 150 species are estimated to be locally endemic (Johns, 2012). It has the highest concentration of *Mimetes* species in the Western Cape, most notably the rare *M. hottentoticus* and *M. capitulatus* (Johns, 2012).

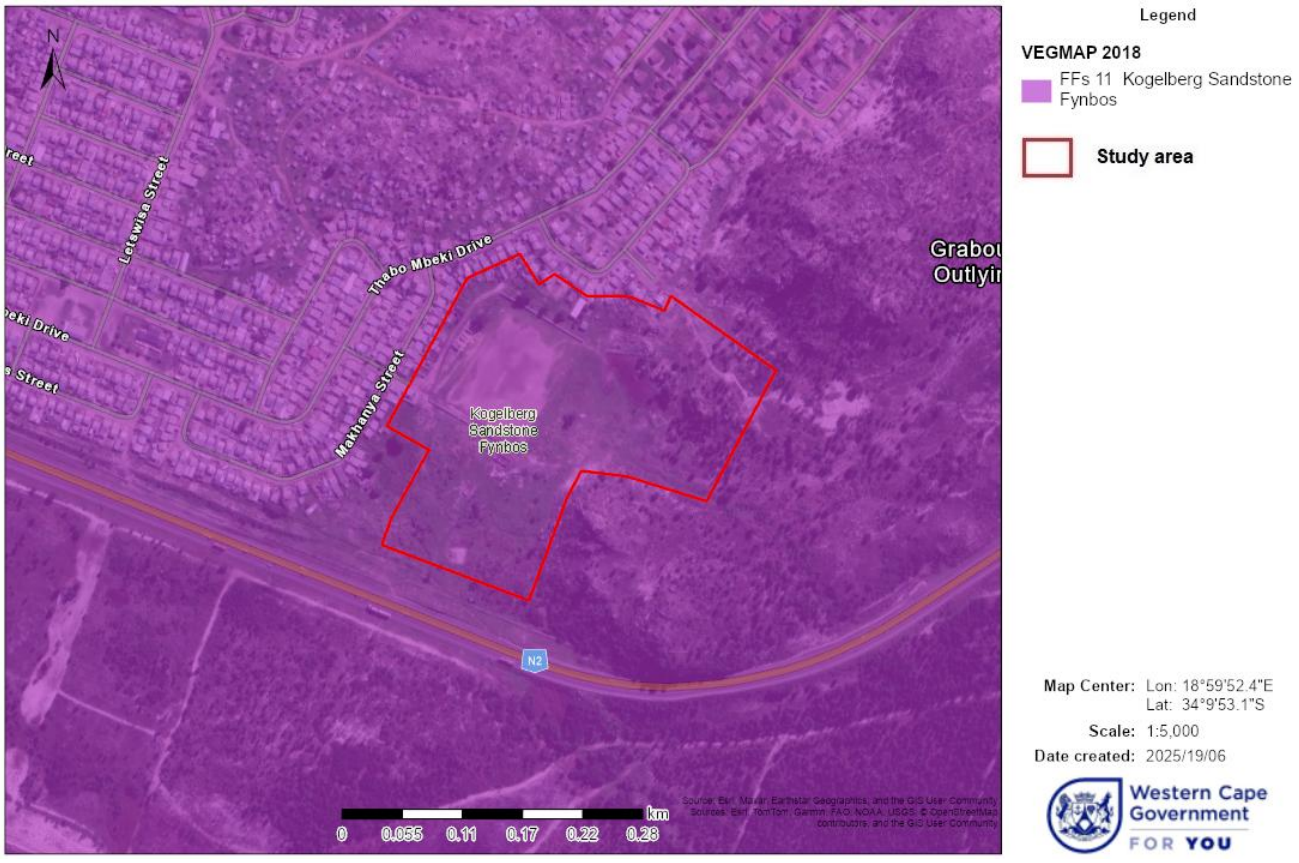

Figure 4-6: Extract of the 2018 SA Vegetation map.

Despite being well represented in the larger area (84% still left), Kogelberg Sandstone Fynbos is listed as Critically Endangered (DEA, 2022). The reason for this is not land use impacts *per se*, but the presence of a high number of threatened species coupled with ecosystem level threats, such as too frequent fires and alien infestation. Invasive species, such as *Pinus pinaster* and *Hakea sericea*, are a big concern. Many threatened species also occur outside the protected areas. Kogelberg Sandstone Fynbos is formally well conserved (75%) in the Hottentots-Holland and Groenlandberg Nature Reserves, as well as the Kogelberg Biosphere Reserve (Mucina, 2006).

The site falls inside the Western Cape biodiversity network (**Figure 4-7**). The western part of it has been mapped as a terrestrial critical biodiversity area (CBA), while the eastern part has been mapped as a degraded critical biodiversity area (CBA2). The latter, which is also considered important in the meeting of biodiversity targets and functioning of the network, is thus recommended for rehabilitation or management. In this instance, restoration of the site seems unachievable due to urban encroachment (need for affordable housing) and associated impacts. The site also does not seem to form part of a critical CBA corridor. Reasons for the importance of the mapped CBA and CBA2 areas include the presence of threatened vertebrate habitat (Bontebok) and water resource protection (Palmiet River).

Figure 4-7: Extract of the Western Cape biodiversity network map.

CBA's are defined as areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure (Pool-

Stanvliet, 2017). These sites are selected for meeting national targets for species, habitats and ecological processes (Pool-Stanvliet, 2017). Many of these areas support known occurrences of threatened plant species, and/or may be essential elements of designated ecological corridors. Loss of designated CBA's is therefore not recommended. ESA's, on the other hand, are supporting zones required to prevent the degradation of CBA's and Protected Areas. The Kogelberg and Steenbras Nature Reserves are the closest protected areas to the site, located about 1.5-2 km away to the west.

5. Results

In order to fulfil in the requirements of the terrestrial biodiversity and plant species protocols, this section describes the vegetation (terrestrial biodiversity) and plant species encountered in two separate subsections. In the plant species subsection specific reference is made to species of conservation concern (SCC) and protected tree species encountered.

Terrestrial biodiversity (vegetation)

The site is highly degraded, with only a few patches of degraded fynbos left (**Figures 5-1** & **5-2**). The degraded fynbos patches are usually alien infested and very rocky. Mostly hardy indigenous shrubs are present here and there, such as *Seriphium plumosum, Senecio pterophorus* and *Pelargonium cucullatum*. The site has been severely impacted by past forestry and urban-related activities. Large patches of grass and herbaceous weeds remain, with parts of the site converted into a sports field and livestock pens (**Figures 5-3** & **5-4**). It is also encroached on the western and northern sides by housing. Other disturbances noted include footpaths crisscrossing the site, waste dumping and invasive woody aliens, especially pines. Small livestock (sheep, boerbok & pigs) grazing was also noted on and around the site. A noticeable scarcity of typical fynbos elements, such as ericas and proteoids, attests to the degraded state of the site. The botanical attributes of the site are presented in **Figure 5-5**.

Structurally, the fynbos outside the site can be described as a low (<1 m) mid-dense to closed shrubland using Campbell's classification of structural forms in the Fynbos Biome (Campbell, 1981). In the rockier areas, vegetation cover dips below 60%. *Maytenus oleoides* is an emergent tall shrub or small tree, noticeable in the rocky areas. Vegetation structure changes into a closed woodland where there is a high presence of invasive acacias and/or pines. Like all fynbos types, Kogelberg Sandstone Fynbos is maintained by a regular fire regime. Unfortunately, landscape fragmentation is disrupting this 'maintenance' requirement, often leading to localised species loss and bush encroachment or alien infestation (pers. obs.). Too frequent fires are also detrimental to certain species, which can also lead to species loss. Fire is an important ecological driver, without which fynbos will deteriorate.

Figure 5-1: View across the degraded eastern part of site.

Figure 5-2: Degraded fynbos on a rocky knoll in the eastern part of site.

Figure 5-3: Typical view of the site.

Figure 5-4: View across the centre of site towards the sports field and livestock pens.

Figure 5-5: Botanical attributes of the site. The untoned areas are highly degraded or transformed.

Plant species

Indigenous shrub species recorded on and around the site, include *Anaxeton asperum, Syncarpha speciosissima, Othonna quinquedentata, Athanasia trifurcata, Seriphium plumosum*, *Helichrysum cf. patulum, Senecio pterophorus, S. burchellii, Ursinia paleacea, Hymenolepis crithmifolia, Psoralea cf pinnata, Passerina corymbosa, Carpobrotus edulis, Maytenus oleoides, Diospyros glabra, Pelargonium cucullatum, Leonotis ocymifolia, Cliffortia sericea*, *C. ruscifolia, Phylica buxifolia, Asparagus rubicundus* and *Solanum linnaeanum.* Hemicryptophytes and geophytes recorded here include *Hypodiscus* species*, Restio capensis, Thamnochortus lucens, Capeochloa cincta, Tetraria thermalis, Juncus effusus*, *Pteridium aquilinum, Oxalis purpurea, O. luteola, O. pes-caprae* and *Zantedeschia aethiopica.* Several more species were recorded in the good quality fynbos to the east of the site.

A fair number of alien species were recorded on and around the site, including *Acacia longifolia* (long-leaved wattle, category 1b), *A. mearnsii* (black wattle, 2), *A. cyclops* (rooikrans, 1b), *Spartium junceum* (Spanish broom, 1b), *Pinus pinaster* (cluster pine, 1b), *Cenchrus clandestinus* (kikuyu, 1b in protected areas), *Stenotaphrum secundatum* (buffalo grass), *Sonchus oleraceus* (sowthistle), *Silybum marianum* (milk thistle), *Ricinus communis* (castor-oil plant, 2), *Datura stramonium* (olieboom, 1b), *Phytolacca octandra* (inkberry, 1b) and *Erigeron bonariensis* (flax-leaf fleabane). The presence of all these is indicative of past disturbances (forestry/agricultural activities). As indicated above, most

of the species are Category 1b and 2 invaders in the Western Cape. In terms of the National Environmental Management: Biodiversity Act (NEMBA) (Act 10 of 2004) Alien and Invasive Species List (2016), Category 1b invasive species require compulsory control as part of an invasive species control programme. Also, the harbouring of category 2 species, such as black wattle and castor-oil plant, is prohibited without a permit. The presence of the woody aliens also presents a fire risk. **Figure 5-6** shows a few of the recorded alien species.

Figure 5-6: Alien species recorded on site, with *Pinus pinaster* (top left), *Silybum marianum* (top right), *Spartium junceum* (bottom left) and *Datura stramonium* (bottom right).

Site Ecological Importance

In order to demonstrate the biodiversity sensitivity of the site, a site ecological importance (SEI) map was prepared (**Figure 5-7**). This map considers the biodiversity importance (BI) of the receptor area and its resilience to impacts (RR). The BI, in turn, is a function of conservation importance (CI) and functional integrity (FI) of the receptor area. The receptor area is described as the affected habitats (i.e. degraded fynbos & highly degraded/transformed areas in this instance), which may accommodate certain SCC. The results of the SEI analysis are presented in **Table 5-1**. A Very Low SEI value was allocated to the largest part of the site due to its highly degraded or transformed state and low species diversity. The degraded fynbos garnered a Medium rating due to its

higher biodiversity importance (BI) and lower resilience to potential impacts. Please note that this assessment only considered the terrestrial biodiversity value of the affected areas, not the aquatic or hydrological value.

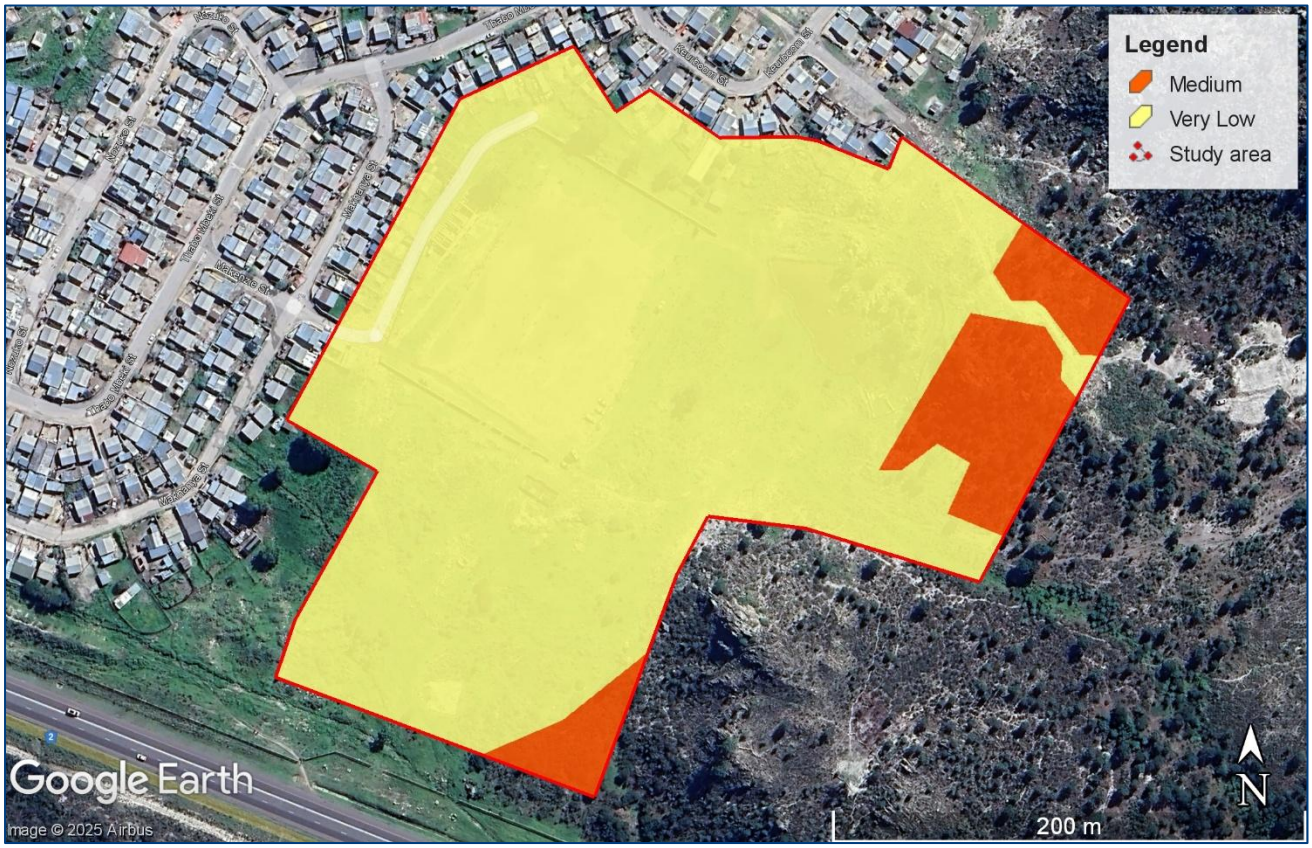

Figure 5-7: Site ecological importance (SEI) map of the site.

Table 5-1: SEI analysis.

	CI	FI	BI	RR	SEI
Degraded fynbos	Medium	Medium	Medium	Medium	Medium
Remainder of site	Low	Low	Low	High	Very Low

6. Potential Impacts

Terrestrial biodiversity (vegetation)

The site is significantly degraded or transformed by past forestry and urban-related activities, and subsequent alien infestation. Due to continued land-use pressures (urban & small farmer activities), species diversity remains very low. The potential for rehabilitation is also very poor and probably unachievable. Only a few degraded fynbos patches are probably worth protecting. However, they are of poor quality and/or infested with woody aliens, especially pines. An estimated 0.7 ha of degraded fynbos is located inside the site. Nearly all of this has been included in the proposed Open Space. Although

the proposed development encroaches heavily onto the biodiversity network (CBA & CBA2), it should not impact on the functionality of the greater biodiversity network for the reasons mentioned above. The only mitigation measure for impacts in this regard would be to implement alien control in the Open Space. As an indirect impact, earthworks during the construction phase will provide ideal conditions for the establishment of invasive alien species. A high presence of aliens, such as pines and acacia species, will exacerbate this impact. The impact posed by the development on terrestrial biodiversity is therefore expected to be of low significance. **Table 6-1** summarises the impact on terrestrial biodiversity.

Table 6-1: Impact on terrestrial biodiversity.

Phase	Construction Phase	Operational Phase
Nature of impact(s)	- Slight encroachment on degraded fynbos (<100 m² of mapped fynbos will be cleared) - Increased opportunity for alien infestation.	- Increased alien infestation.
Extent of impact	Development footprint & immediate surroundings	Development footprint & immediate surroundings
Duration	Permanent	Long term
Intensity	Low	Low
Probability of occurrence	Low	Medium
Degree of reversibility	Low	High
Irreplaceability of resource	Medium-low	Medium-low
Mitigatory potential	High	High
Significance before mitigation	Low	Low
Significance after mitigation	Low	Low

For the reasons mentioned above it is debateable whether Activity 12 of Listing Notice 3 of the NEMA EIA regulations (as amended on 7 April 2017) will be triggered. In terms of the above regulations, the "clearance of an area of 300 m² or more of indigenous vegetation within any critically endangered or endangered ecosystem listed in terms of Section 52 of the NEMBA" is a listed activity. The groundcover vegetation of the development footprint in this instance does not resemble (structurally or floristically) the mapped fynbos found in the larger area. It can thus be argued that the activity does not apply.

Plant species

The impact on plant species, including potential SCC, is also expected to be of low significance. The fynbos species recorded are widespread and common in the region. No SCC were recorded, and none are expected to occur on site. The probability that any SCC

listed in the Screening Report will be impacted is unlikely due to the degraded or transformed state of the site. **Table 6-2** summarises the impact on plant species.

Table 6-2: Impact of the project on flora & potential SCC.

Phase	Construction Phase	Operational Phase
Nature of impact(s)	- Loss of indigenous flora & potential SCC	- Alien infestation & resulting displacement of indigenous flora
Extent of impact	Development footprint & immediate surroundings	Development footprint & immediate surroundings
Duration	Permanent	Long term
Intensity	Low	Low
Probability of occurrence	Low	Medium
Degree of reversibility	Low	High
Irreplaceability of resource	Low	Low
Mitigatory potential	High	High
Significance before mitigation	Low	Low
Significance after mitigation	Low	Low

The **cumulative botanical impact** of the project is expected to be equivalent to the impact on terrestrial biodiversity and plant species described above, i.e. the continued erosion/degradation of Kogelberg Sandstone Fynbos, the biodiversity network, as well as the loss of plant species. In this instance, the slight loss of biodiversity and resultant cumulative impact will be acceptable, due to the transformed or degraded state of the site. In the case of the site not being developed, it will remain in a degraded state with little potential for reverting to the original vegetation in the long term.

7. Recommended Mitigation Measures

The following mitigation measures are recommended to ensure that the impact on terrestrial biodiversity and plant species is minimised during the **construction phase**:

- Fence off the construction area where it borders on fynbos. The watercourse on the eastern side of the site must also not be disturbed or polluted in any way.

Mitigation measures recommended for the **operational phase**:

- As a long-term maintenance requirement, keep the Open Space area clear of invasive aliens, focussing on species such as cluster pine, long-leaved wattle, black wattle, Spanish broom, castor-oil plant and olieboom. These species are category 1b and 2 invaders that require compulsory control as part of an invasive species

control programme. Please note that it is a legal requirement for landowners to clear alien vegetation on their land.

8. Conclusion & Recommendations

This report sets out the results from a desktop study, as well as a field survey conducted on 1 August 2022, to ascertain the terrestrial biodiversity and plant species constraints and the possible impacts associated with an affordable housing development on Portion 9 of Farm Oude Brug 313, located on the southern side of Grabouw.

Due to the highly degraded or transformed state of the site, the impact on terrestrial biodiversity is expected to be of low significance. Due to the severity of past disturbances and current impacts (pollution, trampling & grazing), it is unlikely that it will revert to good quality fynbos in the long term. The site therefore does not present any notable botanical constraints. Please note that this statement focused on the terrestrial biodiversity, not the aquatic attributes of the site.

The development can therefore be considered for approval, but subject to the mitigation measure(s) listed above.

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Annexure 1: Threatened plant species as listed in Screening Report

Sensitivity	Feature(s)
Medium	*Amphithalea bowiei*
Medium	*Argyrolobium aciculare*
Medium	*Liparia calycina*
Medium	*Aspalathus globosa*
Medium	*Aspalathus monosperma*
Medium	*Aspalathus oblongifolia*
Medium	*Aspalathus pinea* ssp. *caudata*
Medium	*Aspalathus stokoei*
Medium	*Lebeckia grandiflora*
Medium	*Podalyria cordata*
Medium	*Agapanthus walshii*
Medium	*Audouinia capitata*
Medium	*Berzelia dregeana*
Medium	*Berzelia ecklonii*
Medium	*Sorocephalus clavigerus*
Medium	*Leucadendron coniferum*
Medium	*Leucospermum bolusii*
Medium	*Leucospermum prostratum*
Medium	*Protea angustata*
Medium	*Protea longifolia*
Medium	*Protea stokoei*
Medium	*Paranomus abrotanifolius*
Medium	*Mimetes arboreus*
Medium	*Mimetes argenteus*
Medium	*Mimetes capitulatus*
Medium	*Mimetes hirtus*
Medium	*Mimetes hottentoticus*
Medium	*Spatalla mollis*
Medium	*Spatalla prolifera*
Medium	*Diastella fraterna*
Medium	*Serruria deluvialis*
Medium	*Serruria flagellifolia*

Sensitivity	Feature(s)
Medium	*Serruria inconspicua*
Medium	*Serruria kraussii*
Medium	*Merciera azurea*
Medium	*Merciera brevifolia*
Medium	*Merciera tenuifolia*
Medium	*Apodytes geldenhuysii*
Medium	Sensitive species 794
Medium	Sensitive species 344
Medium	*Pentameris longiglumis* ssp. *gymnocolea*
Medium	*Pentameris holciformis*
Medium	*Ehrharta setacea* ssp. *uniflora*
Medium	*Echiostachys ecklonianus*
Medium	*Aristea recisa*
Medium	*Aristea zeyheri*
Medium	*Klattia stokoei*
Medium	*Tritoniopsis caledonensis*
Medium	*Geissorhiza cataractarum*
Medium	*Geissorhiza lithicola*
Medium	Sensitive species 934
Medium	*Nivenia levynsiae*
Medium	*Nivenia stokoei*
Medium	*Erica amphigena*
Medium	*Erica filiformis* var. *filiformis*
Medium	*Erica lowryensis* var. *lowryensis*
Medium	*Erica multiflexuosa*
Medium	*Erica nana*
Medium	*Erica patersonii*
Medium	*Erica pycnantha*
Medium	*Erica squarrosa*
Medium	*Erica thomae*
Medium	*Erica chiroptera*
Medium	*Erica pilosiflora* ssp. *pilosiflora*
Medium	*Erica niveniana*
Medium	*Erica ceraria*

Sensitivity	Feature(s)
Medium	*Erica viscaria* ssp. *gallorum*
Medium	*Erica foliacea* ssp. *foliacea*
Medium	*Erica pillansii* ssp. *fervida*
Medium	*Sonderothamnus petraeus*
Medium	*Adenogramma rigida*
Medium	*Grubbia rourkei*
Medium	Sensitive species 714
Medium	*Centella caespitosa*
Medium	*Ficinia elatior*
Medium	*Ficinia micrantha*
Medium	*Ficinia minutiflora*
Medium	*Ficinia pinguior*
Medium	*Thamnochortus dumosus*
Medium	*Anthochortus graminifolius*
Medium	*Ceratocaryum persistens*
Medium	*Hypodiscus alternans*
Medium	*Restio fusiformis*
Medium	*Restio pumilis*
Medium	*Restio villosus*
Medium	*Willdenowia purpurea*
Medium	*Askidiosperma rugosum*
Medium	Sensitive species 1277
Medium	Sensitive species 384
Medium	Sensitive species 460
Medium	Sensitive species 1139
Medium	Sensitive species 373
Medium	*Evotella rubiginosa*
Medium	*Gnidia humilis*
Medium	*Metalasia lichtensteinii*
Medium	*Syncarpha zeyheri*
Medium	*Thaminophyllum multiflorum*
Medium	*Senecio speciosissimus*
Medium	*Osmitopsis parvifolia*
Medium	*Cliffortia viridis*

Sensitivity	Feature(s)
Medium	*Cliffortia prionota*
Medium	*Cliffortia recurvata*
Medium	*Capelio caledonica*
Medium	*Skiatophytum skiatophytoides*
Medium	*Aspalathus lebeckioides*
Medium	*Protea aspera*
Medium	*Protea rupicola*
Medium	*Paranomus bolusii*
Medium	*Pachites bodkinii*
Medium	*Lachnaea grandiflora*

Annexure 2: Site Ecological Importance

Site Ecological Importance (SEI) is considered to be a function of the biodiversity importance (BI) of the receptor (e.g. SCC, the vegetation community or habitat type present on site) and its resilience to impacts (receptor resilience or RR) as follows:

SEI = BI + RR

BI in turn is a function of conservation importance (CI) and the functional integrity (FI) of the receptor as follows:

BI = CI + FI

Conservation importance (CI) is evaluated in accordance with recognised established internationally principles and criteria for the determination of biodiversity-related value, including the IUCN Red List of Species, Red List of Ecosystems and key biodiversity areas. CI is defined here as: "The importance of a site for supporting biodiversity features of conservation concern present, e.g. populations of SCC (CR, EN, VU & NT), Rare species, range-restricted species, and areas of threatened ecosystem types, through mainly natural processes". Fulfilling criteria to evaluate CI do not rely on a single specific threshold for each of the above defining characteristics but can act in combination or in isolation, providing a more robust evaluation of CI (Table 1).

Table 1: Conservation importance (CI) criteria.

CI	Criteria
Very high	Confirmed or highly likely occurrence of CR, EN, VU or Extremely Rare or Critically Rare species that have a global EOO of <10 km^2. Any area of natural habitat of a CR ecosystem type or large area (>0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type.
High	Confirmed or highly likely occurrence of CR, EN and VU species that have a global EOO of >10 km^2. IUCN threatened species (CR, EN & VU) must be listed under any criterion other than A. If listed as threatened only under Criterion A, include if there are less than 10 locations or <10 000 mature individuals remaining. Small area (>0.01% but <0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (>0.1%) of natural habitat of VU ecosystem type. Presence of Rare species.
Medium	Confirmed or highly likely occurrence of populations of NT species, threatened species (CR, EN & VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals. Any area of natural habitat of threatened ecosystem type with status of VU. Presence of range-restricted species.
Low	>50% of receptor contains natural habitat with potential to support SCC. No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species.

CI	Criteria
	<50% of receptor contains natural habitat with limited potential to support SCC.
Very low	No confirmed and highly unlikely populations of SCC. No confirmed and highly unlikely populations of range-restricted species. No natural habitat remaining.

Functional integrity (FI) of the receptor (e.g. the vegetation community or habitat type) is defined here as the receptors' current ability to maintain the structure and functions that define it, compared to its known or predicted state under ideal conditions. Ecological processes can be considered to be mostly intact and functional if the receptor area has low levels of current ecological disruptors, has good connectivity to other areas and is a relatively large area. As for CI, the fulfilling criteria to evaluate FI do not rely on a single specific threshold for each of the above defining characteristics but can act in combination or in isolation (Table 2).

Table 2: Functional integrity (FI) criteria.

FI	Criteria
Very high	Very large (>100 ha) intact area for any conservation status of ecosystem type or >5 ha for CR ecosystem types. High habitat connectivity serving as functional ecological corridors, limited road network between intact habitat patches. No or minimal current negative ecological impacts with no signs of major past disturbance (e.g. ploughing).
High	Large (>20 ha but <100 ha) intact area for any conservation status of ecosystem type or >10 ha for EN ecosystem types. Good habitat connectivity with potentially functional ecological corridors and a regularly used road network between intact habitat patches. Only minor current negative ecological impacts (e.g. few livestock utilising area) with no signs of major past disturbance (e.g. ploughing) and good rehabilitation potential.
Medium	Medium (>5 ha but <20 ha) semi-intact area for any conservation status of ecosystem type or >20 ha for VU ecosystem types. Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches. Mostly minor current negative ecological impacts with some major impacts (e.g. established population of alien and invasive flora) and a few signs of minor past disturbance. Moderate rehabilitation potential.
Low	Small (>1 ha but <5 ha) area. Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat and a very busy used road network surrounds the area. Low rehabilitation potential. Several minor and major current negative ecological impacts.
Very low	Very small (<1 ha) area. No habitat connectivity except for flora with wind-dispersed seeds. Several major current negative ecological impacts

Recalling that biodiversity importance (BI) is a function of conservation importance (CI) and the functional integrity (FI) of a receptor, BI can be derived from a simple matrix of CI and FI as follows:

Biodiversity importance		**Conservation importance**				
		Very high	High	Medium	Low	Very low
Functional integrity	Very high	Very high	Very high	High	Medium	Low
	High	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	Low	Medium	Medium	Low	Low	Very low
	Very low	Medium	Low	Very low	Very low	Very low

Receptor resilience (RR) is defined here as: "The intrinsic capacity of the receptor to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention." The fulfilling criteria to evaluate RR are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor (Table 3) and will require justification by the specialist.

Table 3: Receptor resilience (RR) criteria.

RR	Criteria
Very high	Habitat that can recover rapidly (<5 years) to restore >75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of returning to a site once the disturbance or impact has been removed.
High	Habitat that can recover relatively quickly (5-10 years) to restore >75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Medium	Will recover slowly (>10 years) to restore >75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a moderate likelihood of returning to a site once the disturbance or impact has been removed.
Low	Habitat that is unlikely to be able to recover fully after a relatively long period: >15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a low likelihood of returning to a site once the disturbance or impact has been removed.

RR	Criteria
Very low	Habitat that is unable to recover from major impacts, or species that are unlikely to remain at a site even when a disturbance or impact is occurring, or species that are unlikely to return to a site once the disturbance or impact has been removed.

Finally, after the successful evaluation of both BI and RR as described above, it is possible to evaluate the **site ecological importance (SEI)** from the final matrix as follows:

Site ecological importance		Biodiversity importance				
		Very high	High	Medium	Low	Very low
Receptor resilience	Very low	Very high	Very high	High	Medium	Low
	Low	Very high	Very high	High	Medium	Very low
	Medium	Very high	High	Medium	Low	Very low
	High	High	Medium	Low	Very low	Very low
	Very high	Medium	Low	Very low	Very low	Very low

Table 4: Guidelines for interpreting SEI in the context of the proposed development activities.

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

Annexure 3: Impact Assessment Methodology

Each issue that is identified consists of components that on their own or in combination with each other give rise to potential impacts, either positive or negative, from the project onto the environment or from the environment onto the project. In the EIA the significance of the potential impacts is considered before and after identified mitigation is implemented, for direct, indirect, and cumulative impacts, in the short and long term.

A description of the nature of the impact, any specific legal requirements and the stage (construction/decommissioning or operation) were given. The following criteria will be used to evaluate the significance of each issue that was identified:

Nature: This is an appraisal of the type of effect the activity is likely to have on the affected environment. The description includes what is being affected and how. The nature of the impact will be classified as positive or negative, and direct or indirect.

- **Extent and location**: This indicates the spatial area that may be affected (**Table 1**).

Table 1: Geographical extent of impact

Rating	Extent	Description
1	Site	Impacted area is only at the site – the actual extent of the activity.
2	Local	Impacted area is limited to the site and its immediate surrounding area
3	Regional	Impacted area extends to the surrounding area, the immediate and the neighbouring properties.
4	Provincial	Impact considered of provincial importance
5	National	Impact considered of national importance – will affect entire country.

- **Duration**: This measures the lifetime of the impact (**Table 2**).

Table 2: Duration of Impact

Rating	Duration	Description
1	Short term	0–3 years, or length of construction period
2	Medium term	3–10 years
3	Long term	>10 years, or entire operational life of project.
4	Permanent – mitigated	Mitigation measures of natural process will reduce impact – impact will remain after operational life of project.
5	Permanent – No mitigation	No mitigation measures of natural process will reduce the impact after implementation – impact will remain after operational life of project.

- **Intensity/severity**: This is the degree to which the project affects or changes the environment; it includes a measure of the reversibility of impacts (**Table 3**).

Table 3: Intensity of Impact

Rating	Intensity	Description
1	Negligible	Change is slight, often not noticeable, natural functioning of environment not affected.
2	Low	Natural functioning of environment is minimally affected. Natural processes can be reversed to their original state.
3	Medium	Environment remarkably altered, still functions, if in modified way. Negative impacts cannot be fully reversed.
4	High	Natural functions and processes disturbed – potentially ceasing to function temporarily.
5	Very high	Natural functions and processes permanently cease, and valued, important, sensitive or vulnerable systems or communities are substantially affected. Negative impacts cannot be reversed.

- **Potential for irreplaceable loss of resources**: This is the degree to which the projectwill cause loss of resources that are irreplaceable (**Table 4**).

Table 4: Potential for irreplaceable loss of resources.

Rating	Potential for irreplaceable loss	Description
1	Low	No irreplaceable natural resources will be impacted.
3	Medium	Natural resources can be replaced, with effort.
5	High	There is no potential for replacing a particular vulnerable resource that will be impacted.

- **Probability**: This is the likelihood or the chances that the impact will occur (**Table 5**).

Table 5: Probability of Impact

Rating	Probability	Description
1	Improbable	Under normal conditions, no impacts expected.
2	Low	The probability of the impact to occur is low due to its design or historic experience.
3	Medium	There is a distinct probability of the impact occurring.
4	High	It is most likely that the impact will occur.
5	Definite	The impact will occur regardless of any prevention measures.

- **Confidence**: This is the level of knowledge or information available, the specialist had in his/her judgement (**Table 6**).

Table 6: Confidence in level of knowledge or information

Rating	Confidence	Description
	Low	Judgement based on intuition, not knowledge/information.
	Medium	Common sense and general knowledge inform decision.
	High	Scientific/proven information informs decision.

- **Consequence**: This is calculated as extent + duration + intensity + potential impact on irreplaceable resources.

- **Significance**: The significance will be rated by combining the consequence of the impact and the probability of occurrence (i.e. consequence x probability = significance). The maximum value which can be obtained is 100 significance points (**Table 7**).

Table 7: Significance of issues (based on parameters)

Rating	Significance	Description
1-14	Very low	No action required.
15-29	Low	Impacts are within the acceptable range.
30-44	Medium-low	Impacts are within the acceptable range but should be mitigated to lower significance levels wherever possible.
45-59	Medium-high	Impacts are important and require attention; mitigation is required to reduce the negative impacts to acceptable levels.
60-80	High	Impacts are of great importance, mitigation is crucial.
81-100	Very high	Impacts are unacceptable.

- **Cumulative Impacts**: This refers to the combined, incremental effects of the impact. The possible cumulative impacts will also be considered.