Basic Assessment for a proposed extension of Wildebosch Road and the proposed upgrade of Trumali Road, Stellenbosch, Stellenbosch Municipality, Western Cape Province.

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Prepared for ZUTARI (Pty) Ltd

September 2024

National Legislation and Regulations governing this report.

This is a 'specialist report' and is compiled in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014.

Appointment of Specialist.

David J. McDonald and Adam Labuschagne of Bergwind Botanical Surveys & Tours CC were appointed by Zutari (Pty) Ltd to conduct a botanical survey as part of the Basic Assessment for a proposed small roads project.

Details of Specialist.

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Expertise.

Dr David J. McDonald:

- Qualifications: BSc. Hons. (Botany), MSc (Botany) and PhD (Botany)
- Botanical ecologist with over 40 years' experience in the field of Vegetation Science.
- Founded Bergwind Botanical Surveys & Tours CC in 2006
- Has conducted over 700 specialist botanical / ecological studies.
- Has published numerous scientific papers and attended numerous conferences both nationally and internationally (details available on request)

Curriculum Vitae – Appendix 3

Mr. Adam Labuschagne

- Qualifications: B. Sc. (Zoology), MSc (Ecology & Evolutionary Biology).
- Ecologist with experience in faunal and environmental surveying across a variety of terrestrial and freshwater environments.
- Experience with remote sensing, spatial ecology, and UAV/drone surveys.

Curriculum Vitae – Appendix 4

Independence

The views expressed in the document are the objective, independent views of Dr McDonald and Mr. Labuschagne, and the study was carried out under the aegis of Bergwind Botanical Surveys and Tours CC. Neither Dr McDonald nor Bergwind Botanical Surveys and Tours CC have any business, personal, financial or other interest in the proposed development apart from fair remuneration for the work performed.

Conditions relating to this report

The content of this report is based on the authors' best scientific and professional knowledge as well as available information. Bergwind Botanical Surveys & Tours CC, its staff and appointed associates, reserve the right to modify the report in any way deemed fit should new, relevant or previously unavailable or undisclosed information become known to the author from on-going research or further work in this field, or pertaining to this investigation.

This report must not be altered or added to without the prior written consent of the author. This also refers to electronic copies of the report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must refer to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

Declaration of independence:

We, David Jury McDonald, and Adam Edward Labuschagne, as the appointed Specialists hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that we:

- 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).

Dr David J. McDonald **Mr Adam Labuschagne**

Signature of the specialists:

Bergwind Botanical Surveys & Tours CC

Name of company:

1 December 2023

Date:

CONTENTS

1. Background and Brief

Bergwind Botanical Surveys & Tours CC was appointed by Zutari (Pty) Ltd ('The Client') to undertake a botanical assessment for a small road project that includes the extension of Wildebosch Road and the upgrade of Trumali Road, Stellenbosch.

The primary objective of the survey was to determine the current condition and sensitivity of the vegetation at the proposed site, and the level of impact of the proposed road construction on the plant communities present.

The survey was conducted in terms of the National Environmental Management Act (NEMA) (No.7 of 1998) as amended and the 2014 Environmental Regulations. The protocols pertaining to terrestrial ecological specialist assessments are applied (GN 320 of 2020). The survey complies with the Guidelines for Environmental Assessment in the Western Cape, laid out by the Fynbos Forum (De Villiers *et al.*, 2005, Cadman, 2016).

2. Terms of Reference

- Take cognizance of, and comply with, the substantive content requirements outlined within Appendix 6 of GN R982, as amended (i.e. GN 326), which outlines the legal minimum requirements for specialist studies in terms of the 2014 NEMA EIA Regulations, as amended;

- Adhere to the protocols applicable to specialists for environmental impact assessments (Government Gazette, 2020).

- Described the local and regional context of the vegetation communities and plant species within the affected areas.

- The ecosystem status and conservation value of the vegetation communities, including the whether the potentially affected areas comprise critically endangered or endangered ecosystem(s) listed in terms of Section 52 of the NEMBA;

- Record any rare or endangered species encountered or likely to be or have been present.

- The presence of and proximity of the proposed site to protected area(s) identified in terms of NEMPAA and proximity to a Biosphere Reserve (where relevant) (within, at least, a 20km radius of the site).

3. Survey Area

3.1 Locality

The survey area is located in the south-east of Stellenbosch, between the suburbs of Paradyskloof and Brandwacht (figure 1). The small roads project involves the extension of Wildebosch Road, a currently incomplete road connected to Paradyskloof Road, in a north-east direction to join Trumali Road. Trumali Road will also be upgraded as part of the project. The majority of the proposed road will traverse agricultural land currently being used to grow grapes, with a small section of the road crossing an unchanneled valley bottom wetland near the junction of Wildebosch and Paradyskloof Roads.

Figure 1. ESRI ™ Satellite image depicting the survey area. The survey line and sample waypoints are shown in yellow and blue respectively. The proposed extension of Wildebosch Road (Red) and upgrade to Trumali Road (green) area highlighted on the map.

3.2 Geology, topography, and soils

The topography of the site is characterized by a hill on which a vineyard is situated (figure 2, Photo A). This hill is flanked on its southern side by a narrow floodplain that drains east to west (figure 3, Photo A) into a small watercourse that flows along the southern boundary. Trumali Road runs east to west, down a moderate slope (figure 3, photo C). The underlying geology across the entire survey area belongs to the Tygerberg Formation (figure 3).

The Tygerberg Formation, a subset of rocks within the Malmesbury Group, consists of layers of greywacke, immature quartzite, and phyllite, laid down during the late Precambrian era (~ 1000 - 520 MYA) (Theron *et* al., 1993; Belcher, 2003). In terms of soils, the survey area is divided into two sections. The high ground, in the vineyard and along Trumali Road, has well drained red-yellow soils with little to no textural contrast whereas the soils located in the low-lying area to the south of the vineyard have a strong textural contrast with a marked accumulation of clay.

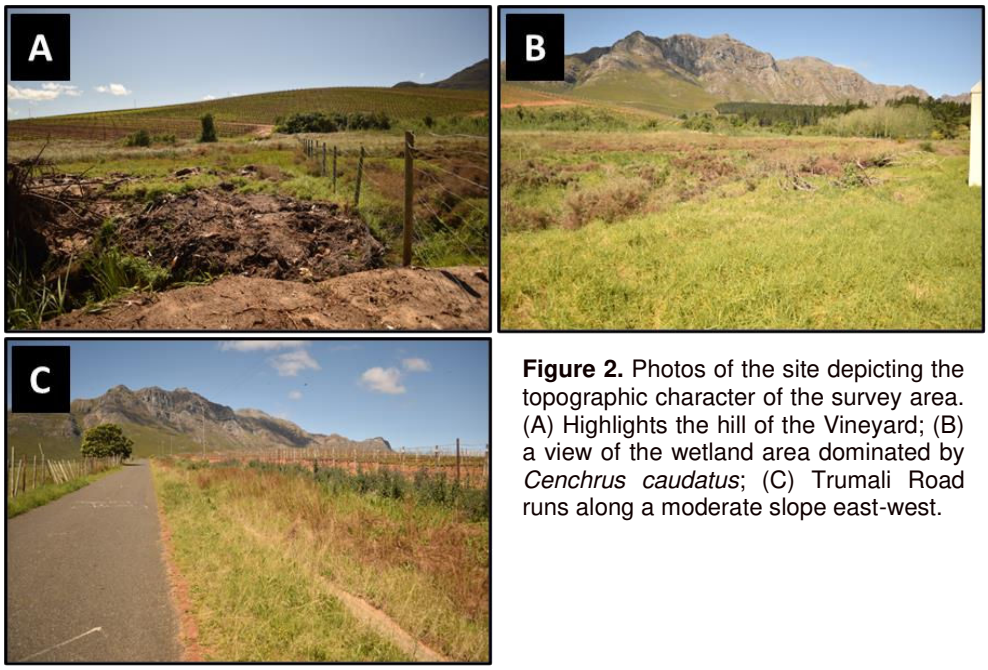


Figure 2. Photos of the site depicting the topographic character of the survey area. (A) Highlights the hill of the Vineyard; (B) a view of the wetland area dominated by *Cenchrus caudatus*; (C) Trumali Road runs along a moderate slope east-west.

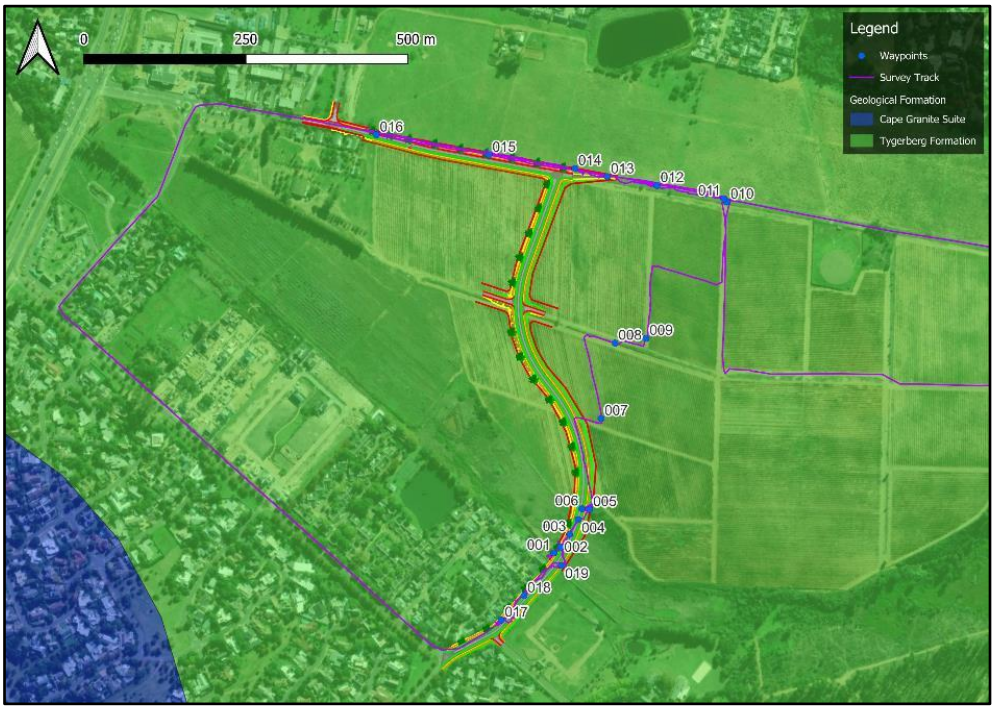


Figure 3. Geological map of the survey area, encompassing the proposed small roads project. The underlying geology of the site belongs entirely to the Tygerberg Formation (green).

3.3 Climate

The survey area is characterized by a winter-rainfall regime, with a mean annual precipitation of 430 mm (figure 4), however, the proximity of the site to the slopes of the Hottentots-Holland Mountains is likely to increase the level of precipitation to ~ 670 mm *per annum.* The climate of the survey area is classified as *Csb* or temperate Mediterranean, with dry warm summers and cool wet winters (Beck *et al*., 2017). Mist is common during winter. The warmest months of the year are January-February, with daily maximum temperatures of 29.6°C.

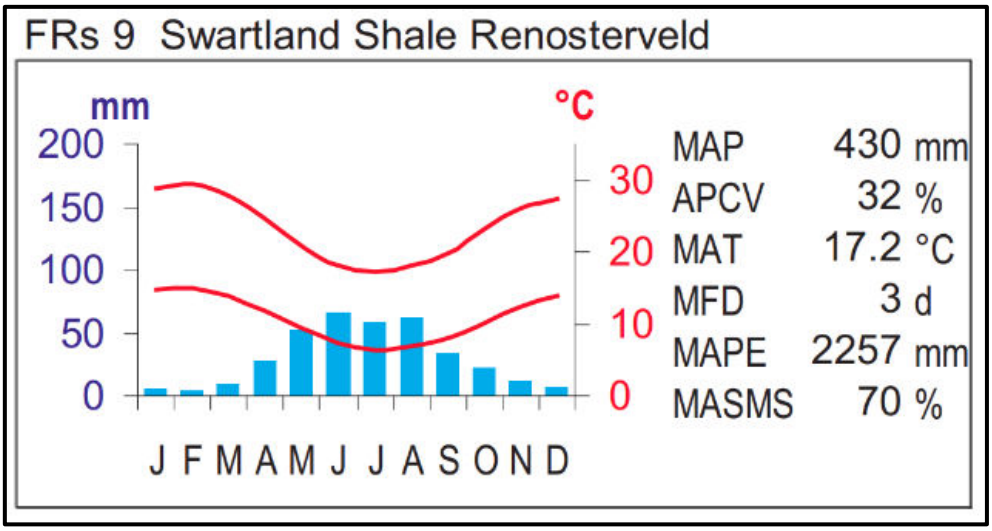


Figure 4. Climate diagram of Swartland Shale Renosterveld. MAP: Mean Annual Precipitation; APCV: Annual Precipitation Coefficient of Variation; MAT: Mean Annual Temperature; MFD: Mean Frost Days; MAPE: Mean Annual Potential Evaporation; MASMS: Mean Annual Soil Moisture Stress (Rebelo *et al.* 2006, In Mucina & Rutherford, 2006)

4. Methods

4.1 Desk-top analysis and reporting

Initial observations of the site were conducted using satellite imagery sourced from ESRI, with the expected vegetation at the site determined using the National Vegetation Map (VEGMAP) (SANBI, 2018). Thereafter the site was assessed using the National Web Based Screening Tool (https://screening.environment.gov.za/screeningtool) in order to determine the sensitivity of the site, and as a basis for comparison of the condition and sensitivity of the area determined by fieldwork.

4.2 Field Sampling

The fieldwork for the assessment of the site was carried out on 26th September 2023. The survey was completed in 5 hours. Weather at the site was fine, however the previous two days were subject to very high levels of precipitation (~100mm over two days) during a strong spring storm. Storm damage was evident in the low-lying areas of the proposed Wildebosch Road extension.

The survey area was accessed via Trumali Road and the Paradyskloof Water Treatment Facility and was surveyed on foot using a "Rapid-assessment Method", following the layout of the proposed small roads project (figure 1). It should be noted that due to the layout of the vineyard, it was not possible to follow the proposed road expansion exactly, however, the vegetation in this area was comprised primarily of agricultural weeds. Waypoints were recorded at several locations using a handheld Garmin eTrex 10®. The condition of the site at each waypoint, along with the species encountered, was recorded and photographs were taken to support the written observations. A total of 19 waypoints were sampled. The survey track and waypoints are shown in figure 1.

5. Limitations and Assumptions

As the optimal season to conduct floral surveys in the south-western Cape is during the spring flower season, the time of the survey was ideal for seeing both the spring annuals and geophytic components of the plant community at the site. This is of particular importance in renosterveld vegetation due to the high number of geophytes present in this vegetation type. It is therefore assumed that the plant community observed during this survey is an accurate representation of the plant species richness of the area.

6. Disturbance regime

The greater part of the survey area has been subject to some degree of historical disturbance. The area of the site currently occupied by a vineyard has been most severely altered, however the construction of Trumali Road has also resulted in significant alterations to the naturally occurring habitat. Additionally, the low-lying area in the southern part of the site has been subject to more recent disturbance in the form of a drainage trench, which may have affected the presence of species that inhabit seasonal wetland habitats (figure 5).

Figure 5. Photographs of the site showing recent disturbance in the low-lying areas of the proposed Wildebosch Road extension. Note previous clearing of *Cenchrus caudatus* and recent soil disturbance (left), and a drainage trench dug as a possible flood mitigation measure (right).

7. The Vegetation

7.1 The vegetation in context

The natural climatic and edaphic climax community expected in the greater part of the site is Swartland Shale Renosterveld (figure 6) (SANBI, 2018). The southern portion of the Wildebosch Road extension is situated in Swartland Granite Renosterveld.

Swartland Shale Renosterveld is characterized by low to moderately high shrubland, dominated by renosterbos (*Dicerothamnus rhinocerotis*) and other shrub species such as *Searsia angustifolia* and *Olea europaea subsp. cuspidata.* Heuweltjies are a common feature of the landscape and are often associated with patches of thicket.

Swartland Granite Renosterveld is characterized by a mosaic of herbaceous grassland and moderately dense shrublands dominated by *Dicerothamnus rhinocerotis*. As with Swartland Shale Renosterveld, thicket communities are often associated with heuweltjies.

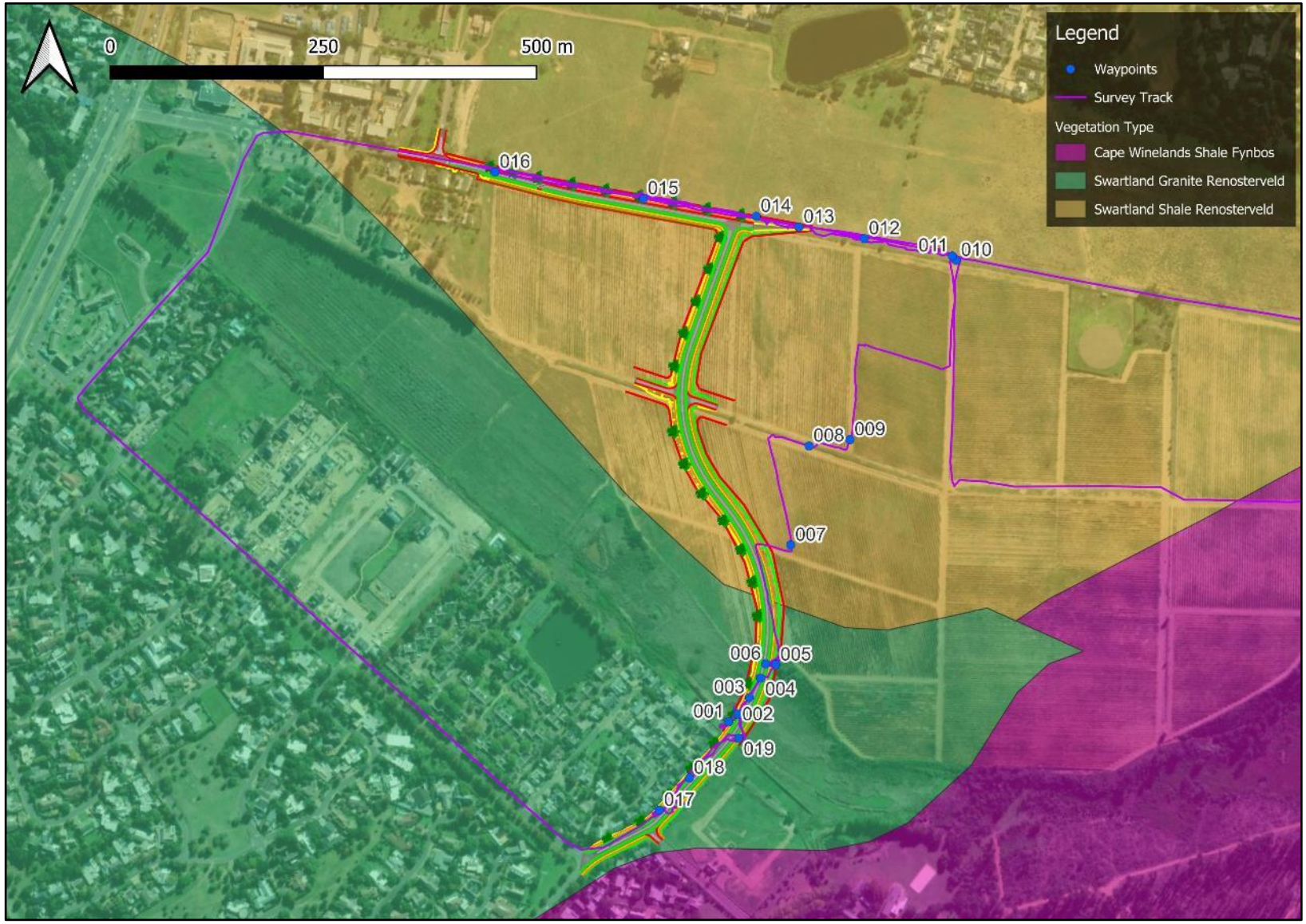


Figure 6. Portion of the *Vegetation map of South Africa, Lesotho, and Swaziland* (Mucina, Rutherford & Powrie 2006; SANBI, 2018) superimposed on a Google Earth ™ satellite image, showing the dominant vegetation types at the study area: Swartland Shale Renosterveld and Swartland Granite Renosterveld.

7.2 Vegetation recorded at sample waypoints.

The survey was started roughly halfway along the proposed extension of the Wildebosch Road. The site was accessed from the Paradyskloof Water Treatment Works, but a fence precluded access to the southernmost portion of the site. There was an entrance to this area via a gate at the end of Wildebosch Road. The co-ordinates of the waypoints and corresponding photographs and descriptions are presented in table 1.

Table 1. The vegetation and habitat found at the sample waypoints with accompanying photographic illustrations.

Waypoint	Co-ordinates	Notes	Illustration
STLN 001	*S 33°57'49.9", E 18°51'42.9"*	Waypoint STLN 001 is located near the fence line that runs north-south across the proposed Wildebosch Road extension. A small watercourse runs perpendicular to the proposed extension. There was significant recent storm damage consisting of bank erosion and a downed *Pinus pinea* tree **Species:** *Briza maxima, Erodium sp., Fumaria muralis, Helminthotheca echiodes, Lysimachia arvensis, Medicago polymorpha, Pennisetum clandestinum, Pterygodium orobanchoides, Seriphium plumosum, Typha capensis, Wachendorfia brachyandra, Zantedeschia aethiopica.*	  

STLN 002	*S 33°57'49.6", E 18°51'43.4"*	Waypoint STLN 002 is situated in an open vlei habitat with a significant population of *Wachendorfia brachyandra*. The substrate was highly saturated. **Species:** *Cenchrus caudatus, Disa bracteata, Moraea collina, Myosotis discolor, Oxalis purpurea, P. clandestinum, Plantago lanceolata, P. orobanchoides, Romulea rosea, Rumex acetosella, Senecio pterophorus, S. plumosum, Triglochin bulbosa, Vicia* sp., *W. brachyandra, Z. aethiopica.*	
STLN 003	*S 33°57'49.0", E 18°51'43.9"*	The vegetation at waypoint STLN 003 is dominated by *Cenchrus caudatus*, with a path cleared that roughly corresponds to the proposed extension of Wildebosch Road. There is also a moderate invasion by *Populus nigra c.f.* to the east of the waypoint. **Species:** *C. caudatus, L. arvensis, O. purpurea, P. lanceolata, S. plumosa, W. brachyandra, Z. aethiopica.*	

STLN 004	*S 33°57'48.3", E 18°51'44.5"*	The soil at waypoint STLN 004 is highly disturbed by a vehicle, with deep trenches dug by tyre tracks. The area around the waypoint is subsequently very muddy and occupied by rideral species. **Species:** *Buddleja saligna, C. caudatus, Cirsium vulgare, Echium plantagineum, F. muralis, H. echiodes, Isolepsis cernua, L. arvensis, M. polymorpha, P. lanceolata, Z aethiopica.*	
STLN 005	*S 33°57'47.8", E 18°51'45.2"*	Waypoint STLN 005 is located next to a patch of thicket vegetation. Whereas this patch of vegetation stands on the edge of the proposed road expansion, it has been included due to the refuge it offers to wildlife that may be displaced by the development. **Species:** *Laurus nobilis, Olea europaea subsp. cuspidata, Searsia angustifolia.*	

STLN 006	*S 33°57'47.8", E 18°51'44.8"*	The area in which waypoint STLN 006 is situated is highly transformed as the landscape is currently used for a vineyard. Other than *Vitis vinifera*, the only other plant species present are weedy or ruderal species. **Species:** *Avena fatua, C. vulgare, Dimorphotheca pluvialis, E. plantagineum, Erodium* sp., *H. echiodes, L. arvensis, Malva parviflora, P. clandestinum, Polygonum aviculare, Raphanus rugosum, Stachys arvensis.*	
STLN 007	*S 33°57'43.4", E 18°51'46.4"*	The vegetation at waypoint STLN 007 is a continuation of the vegetation found at the previous waypoint – a cultivated area dominated by *V. vinifera,* accompanied by ruderal species common to agricultural areas. The area is grassier than the previous waypoint. **Species:** *Avena fatua, C. vulgare, D. pluvialis, E. platagineum, Erodium* sp., *H. echiodes, L. arvensis, Malva parviflora, Melinis cf. natalensis, P. clandestinum, Polygonum aviculare, Raphanus rugosum, Stachys arvensis.*	

STLN 008	*S 33°57'39.7", E 18°51'47.5"*	Waypoint STLN 008 is located on a service road that runs through the vineyard. There is an overgrown embankment running along a drainage line, dominated by weedy species. **Species:** *A. fatua, , Cotula turbinata, Cynodon dactylon,D. pluvialis, E. platagineum, Erodium* sp., *Lactuca* sp., *L. arvensis, M. parviflora, M. polymorpha, P. aviculare, P. clandestinum. R. rugosum.*	
STLN 009	*S 33°57'39.6", E 18°51'49.4"*	Waypoint STLN 009 is located within the vineyard portion of the site and shares a species composition similar to that of the previous few waypoints. **Species:**. *fatua, C. dactylon, C. turbinata, C. vulgare, D. pluvialis, E. plantagineum, Erodium* sp., *H. echioides, L. arvensis, M. parviflora, Melinis cf. natalensis, P. clandestinum, P. aviculare, R. rugosum, S. arvensis.*	

STLN 010	*S 33°57'33.1", E 18°51'54.9"*	Waypoint STLN 010 is located at the proposed intersection between Trumali and Wildebosch Roads. The area is still located within the vineyard, with a fence separating the vineyard from the road. **Species:** *Briza maxima, Convolvulus sagittatus, C. dactylon, E. plantagineum, Erodium* sp., *Melinis cf. natalensis, P. aviculare, R. rugosum.*	
STLN 011	*S 33°57'33.0", E 18°51'54.7"*	Waypoint STLN 011 is situated along the existing Trumali Road. The vegetation along the verge is grassy, with several renosterveld elements that have likely re-established post disturbance. Note that the species composition on the northern verge (the narrowest verge) is relatively depleted. **Species:** *B. maxima, C. sagittatus, C. turbinata, C. dactylon, Dicerothamnus rhinocerotis, D. pluvialis, E. plantagineum, Erepsia bracteata, Hyparrhenia hirta, M. polymorpha, Leysera gnaphalodes, L. arvensis, M. natalensis, O. cuspidata, Oxalis pes-caprae, O. purpurea, Petrorhagia dubia, P. lanceolata, P. aviculare, R. rosea, Romulea flava, Trifolium angustifolium.*	

STLN 012	*S 33°57'32.0", E 18°51'50.8"*	Waypoint STLN 012 is a continuation of the vegetation found at Waypoint STLN 011 – a grassy verge containing several Renosterveld elements. **Species:** *B. maxima, Chrysocoma ciliata, C. sagittatus, C. turbinata, C. dactylon, D. rhinoceotis, D. pluvialis, E. platagineum, E. moschatum, H. hirta, M. polymorpha, L. gnaphalodes, L. arvensis, M. natalensis, O. cuspidata, Osteospermum monstrosum, O. pes-caprae, O. purpurea, Pelargonium myrrhifolium subsp. myrrhifolium, P. dubia, P. lanceolata, R. rosea, S. plumosum, T. angustifolium.*	
STLN 013	*S 33°57'31.4", E 18°51'47.9"*	The community around waypoint STLN 013 has a lower proportion of ruderal species than the vegetation at waypoints STLN 011 and STLN 012, with several other renosterveld species present in the area. **Species:** *Arctotis acaulis, C. turbinata, C. dactylon, D. rhinocerotis, E. plantagineum, Eriocephalus africanus, E. bracteata, E. moschatum, Gnidia* sp., *Helichrysum petiolare, H. hirta, L. gnaphalodes, L. arvensis, M. polymorpha, O. purpurea, O. pes-caprae, P. dubia, P. lanceolata, Polygala bracteolata, R. rosea, Silene gallica, T. angustifolium.*	

STLN 014	*S 33°57'30.9", E 18°51'46.0"*	The verge area in which waypoint STLN 014 is located is more disturbed than at the previous waypoint, with ruderal species showing greater dominance. **Species:** *Anthospermum aethiopicum, Anthospermum spathulatum, C. turbinata, C. dactylon, D. rhinocerotis, D pluvialis, E. plantagineum, E. africanus, E. bracteata, E. moschatum, H. petiolare, H. hirta, L. gnaphalodes, L. arvensis, M. polymorpha, Moraea miniata, O. purpurea, O. pes-caprae, P. dubia, P. lanceolata, P. bracteolata, R. rosea, T. angustifolium.*	
STLN 015	*S 33°57'29.9", E 18°51'40.9"*	The vegetation around waypoint STLN 015 is grass dominated, mainly by *Hyparrhenia hirta*, with *Echium plantagineum* growing densely along the fence line. A lone black wattle (*Acacia mearnsii*) was found growing on the north side of the verge. **Species:** *C. turbinata, C. dactylon, D. pluvialis, E. plantagineum, E. moschatum, H. hirta, L. gnaphalodes, L. arvensis, M. polymorpha, M. miniata, O. purpurea, O. pes-caprae, P. dubia, P. lanceolata, P. bracteolata, R. rosea, T. angustifolium.*	

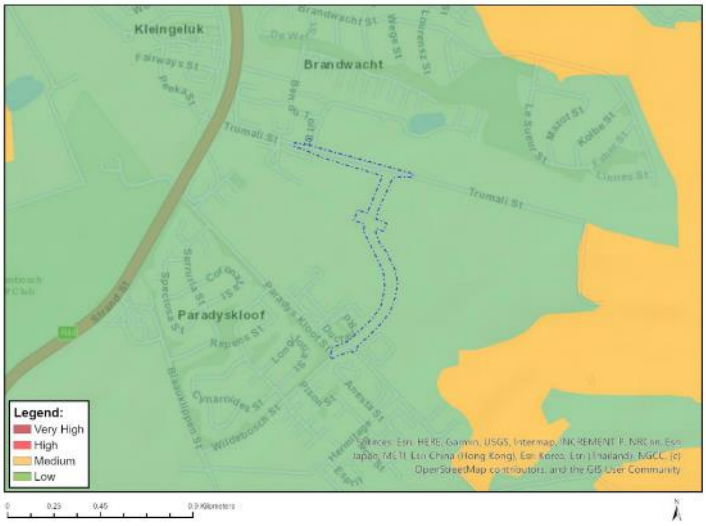
STLN 016	*S 33°57'28.4", E 18°51'34.3"*	Waypoint STLN 016 corresponds to the entrance to the Paradyskloof Water Treatment works. Along the southern side of the road is an avenue of Wild Olive (*Olea europaea subsp. cuspidata*). The rest of the verge is dominated by weedy ruderal species. **Species:** *A. fatua, C. turbinata, C. dactylon, D. pluvialis, E. plantagineum, E. moschatum, H. hirta, L. gnaphalodes, L. arvensis, M. polymorpha, M. miniata, O. purpurea, O. pes-caprae, P. dubia, P. lanceolata, R. rosea, T. angustifolium.*	
STLN 017	*S 33°57'53.0", E 18°51'39.5"*	Waypoint STLN 07 marks the start of the Wildebosch Road expansion. The vegetation is dominated by *Cenchrus caudatus*, interspersed with *Zantedeschia aethiopica*. A small stream runs east to west across the area. Kikuyu grass is prominent in the disturbed open areas around the waypoint. A large patch of greater periwinkle (*Vinca major*) is found near the walls of the houses at the west end of the site. A painted reed frog (*Hyperolius marmoratus*) was seen on an Arum Lily. **Species:** *C. caudatus, Cliffortia odorata, C. dactylon, Kniphofia* sp., *O. pes-caprae, O. purpurea, P. clandestinum, R. rosea, Vinca major, Z. aethiopica.*	

STLN 018	*S 33°57'51.9", E 18°51'40.9"*	The vegetation around waypoint STLN 018 is a continuation of that around waypoint STLN 019. It is dominated by *C. caudatus* with Kikuyu grass on the more disturbed land along the western portion of the site. A large drainage ditch has been recently dug, likely as a flood-mitigation measure. **Species:** *C. caudatus, C. dactylon, O. pes-caprae, O. purpurea, P. clandestinum, P. lanceolata, R. rosea, S. pterophorus, Z. aethiopica.*	
STLN 019	*S 33°57'50.5", E 18°51'43.3"*	Waypoint STLN 019 is located close to Waypoint STLN 001. The drainage ditch observed at waypoint STLN 018 joins a stream that runs east to west. A large concrete structure, likely a stormwater drain, is located at the confluence of the two water courses. The area is rather disturbed, dominated by *Penisetum clandestinum*, with *Cenchrus caudatus* in the larger watercourse. **Species:** *A. fatua, B. maxima*, *C. caudatus, C. dactylon, Lactuca* sp., *Nasturtium officinale, O. purpurea, P. clandestinum, Physalis peruviana, P. lanceolata, R. rosea, S. pterophorus, S. plumosa, T. bulbosa, Z. aethiopica.*	

8. Conservation status and Vegetation Sensitivity.

8.1 National Web Based Screening Tool

The National Web Based Screening Tool was applied to the area of the proposed small road at Wildebosch and Trumali Roads. The results of the Plant Species Sensitivity Screening (figure 7) indicate a **Low** level of plant sensitivity over the entire site. The results of the survey support this classification, as most of the site is located on a vineyard or disturbed roadsides.



Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
			X

Figure 7. The map for relative plant species theme sensitivity produced by the National Web-based Environmental Screening Tool. The area in which the site is located has been classified as having a **Low** plant species sensitivity.

The results produced by the web based environmental screening tool concerning Terrestrial Biodiversity describe the survey area as having a **VERY HIGH** sensitivity (figure8). Field observations do not support this designation. The majority of the survey area has undergone significant disturbance, either through road construction or agricultural activities, leading to a decline in biodiversity across most of the survey area. Some renosterveld elements are present at the site, however this is likely secondary vegetation that has re-established post disturbance. A more suitable sensitivity classification would be **Medium.**

Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
X			

Sensitivity	Feature(s)
Very High	Critical Biodiversity Area 1: Terrestrial
Very High	Ecological Support Area 1
Very High	Ecological Support Area 2: Restore from other land use
Very High	SWSA (SW) _ Boland
Very High	Endangered ecosystem: Swartland Shale Renosterveld
Very High	Endangered ecosystem: Swartland Granite Renosterveld

Figure 8. The map from the National Web-based Environmental Screening Tool for the Relative Terrestrial Biodiversity Theme Sensitivity indicating that on the area in which the site is located is classified as having **Very High Sensitivity.**

8.2 Threat Status

According to the National List of Threatened Terrestrial Ecosystems (Government Gazette, 2011; Government Gazette Vol. 689, 2022), Swartland Shale Renosterveld is classified as Critically Endangered (A3; A3alt) due to significant spatial decline. Swartland Granite Renosterveld is classified as Endangered (A2b; A3; A3alt; B1(i); B1(iii)), due to its narrow distribution, ongoing habitat loss, and biotic disruption by alien invasive species and overgrazing.

8.3 Red List Ecosystems (RLE)

The Red List of Ecosystems (2021) describes the extent of each of the 458 ecosystem types first identified in the National List of Threatened Terrestrial Ecosystems (2011), which was revised in 2021 (SANBI, 2021). A small area of the proposed project site is designated as an Endangered ecosystem type (figure 9), a remnant of Swartland Granite Renosterveld, located in the southern portion of the site. Note that this area also corresponds to the location of a population of *Wachendorfia brachyandra* (figure 11), a species of conservation concern.

Figure 9. The Red List of Ecosystems (2021) map overlaid on an ESRI ™ Satellite image of the proposed maintenance sites. Orange areas indicate habitat classified as Endangered.

8.4 Critical Biodiversity Areas and Ecological Support Areas

Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) from the Cape Nature Western Cape Biodiversity Spatial Plan (2017) were overlaid on a satellite image of the site (figure 10). Areas designated CBA1 are areas deemed likely to be in natural condition, whereas CBA2 areas are potentially degraded or represent secondary vegetation. Very small areas along Trumali Road have been mapped as CBA 1. Waypoints STLN 012 to STLN 015 are located within an area described as CBA1.

ESAs are areas intended to support the functionality of both Protected Areas and Critical Biodiversity areas. An area designated ESA1 is an area that is likely still functional (near natural or moderately degraded) whereas ESA2 denotes severely degraded areas. According to the Western Cape Biodiversity Spatial Plan, there are several parts of the study area that have been mapped as ESA 2, along the watercourse in the vicinity of Wildebosch Road.

There is one Protected Area in close proximity to the site, the Hottentots Holland Mountain Catchment Area, located approximately 2 kilometers to the east of the surveyed area. The site is located within the Cape Winelands Biosphere reserve.

Figure 10. The Critical Biodiversity Map (Cape Nature WCBSP, 2017) for the area of the proposed small roads project, overlaid on an ESRI ™ satellite image.

9. Plant Species of Conservation Concern.

One plant species of conservation concern, *Wachendorfia brachyandra,* was recorded in a vlei at waypoints STLN 002 and STLN 003 (figure 11) *W. brachyandra* is listed as **Vulnerable** due to habitat loss as a result of urban expansion; at least 40% of known locations have gone extinct since 1940.

Figure 11. Location of *Wachendorfia brachyandra* population (Purple), overlaid on an ESRI ™ satellite image.

10. Impact Assessment

The impacts on the vegetation and the terrestrial biodiversity of the survey area as a result of the proposed extension and upgrade to Wildebosch and Trumali Roads are assessed in this section of the report.

10.1 'No Go' Alternative

Under the "No Go" alternative, there would be no construction performed anywhere on the site, and the current vegetation would persist. The ongoing biotic disruption by invasive vegetation is likely to continue however the persistence of *Wachendorfia brachyandra* (classified as **Vulnerable**) at the site means that the 'No Go' alternative could result in a **Low positive** impact. The 'No Go' alternative is assessed in table 2.

10.2 Direct Impacts

When assessing the direct impacts, two scenarios have been considered. **Scenario 1** covers the original construction plan, involving the extension of Wildebosch Road and the upgrade of Trumali Road. Owing to the presence of a population of *Wachendorfia brachyandra* directly in the footprint of the proposed road extension of Wildebosch Road, the potential impacts and significance of these activities is estimated to be **High Negative**.

Scenario 2 involves altering the construction footprint of the Wildebosch Road expansion to avoid the wetland habitat in which *W. brachyandra* is located. Avoiding this habitat should yield a significant reduction in the estimated impact, with the significance estimated to be **Low Negative.** In both scenarios, the direct impacts of the alternative route have also been considered.

Table 2. Impact and Significance – Loss of natural vegetation and habitat as a result of extension of Wildebosch Road and upgrade of Trumali Road.

CRITERIA	'NO GO' Alternative	Scenario 1 (Original)		Scenario 2 (Alternative route)	
Nature of direct impact	**Loss of Remnant Swartland Shale Renosterveld and Swartland Granite Renosterveld**				
		WITHOUT MITIGATION	**WITH MITIGATION**	**WITHOUT MITIGATION**	**WITH MITIGATION**
Extent	Local	Regional	Local	Regional	Local
Duration	Long-term	Long-term	Long-term	Long-term	Long-term
Intensity	Medium	Medium	Low	Medium	Low
Probability of occurrence	Probable	Probable	Probable	Probable	Probable
Confidence	High	High	High	High	High
Significance	Low Positive	High Negative	Low Negative	Medium Negative	Very Low Negative
Nature of Cumulative impact	**Loss of Remnant Swartland Shale Renosterveld and Swartland Granite Renosterveld**				
Cumulative impact prior to mitigation	Low Negative				
Degree to which impact can be reversed	Irreversible				
Degree to which impact may cause irreplaceable loss of resources	Medium				
Degree to which impact can be mitigated	Medium				
Proposed mitigation	• Minimize construction footprint • Where possible revegetate disturbed areas • Search and Rescue of *Wachendorfia brachyandra* to be placed in suitable habitat nearby. • Alien clearing to prevent colonisation of disturbed areas				
Cumulative impact post mitigation	Very Low negative				
Significance of cumulative impact (broad scale) after mitigation	Very Low negative				

10.3 Mitigation

The following mitigation measures are recommended:

- The re-establishment of vegetation on watercourse banks and in areas disturbed by construction activities.
- Construction camp to be located in previously disturbed areas, such as agricultural fields.
- Search and Rescue of *Wachendorfia brachyandra* and other species likely to be affected by construction.
- Installation of culverts or a raised road way to allow for movement of water through the wetland.
- Removal of alien and invasive species in the vicinity of proposed construction sites must be carried out in order to prevent establishment of these species in any disturbed areas.
- Minimize the construction footprint, in particular in the vicinity of wetland habitat as these soils are highly sensitive to compaction and disturbance.

10.4 Indirect impacts

The indirect impacts of the proposed maintenance work are estimated to be of low significance.

10.5 Cumulative impacts

Swartland Shale Renosterveld and Swartland Granite Renosterveld are classified as **Critically Endangered** and **Endangered** vegetation types (Figure 7) and any loss of habitat should be avoided where possible. Given that most of the proposed site has seen significant disturbance and transformation, the cumulative impact of this proposed project is estimated to be Low Negative.

11. Conclusions

The vegetation across most of the proposed small roads project is classified as Swartland Shale Renosterveld, with Swartland Granite Renosterveld in the southern portion of the site (figure 7). The outcome of the assessment has determined that large portions of the site, in particular those areas utilized for grape cultivation, have undergone significant transformation and disturbance, preserving little to no original vegetation. One species of conservation concern, *Wachendorfia brachyandra*, was documented in a wetland habitat near waypoints STLN 002 - STLN 005 (figure 11). If the preferred scenario (**scenario 2**) is followed and the recommended mitigation measures are implemented, it is estimated that the proposed project should result in a **Low Negative** impact. Should the original scenario (**scenario 1**) be implemented alongside the recommended mitigation measures, it is estimated that the development should result in a **Moderate Negative** impact.

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Report submitted: 25 September 2024

Appendix 1: Impact Assessment Methodology

The assessment of impacts needs to include the determination of the following:

- The nature of the impact – see Table 1.1
- The magnitude (or severity) of the impact – see Table 1.2
- The likelihood of the impact occurring - see Table 1.2

The degree of confidence in the assessment must also be reflected.

Table 1.1 Impact assessment terminology

Term	Definition
Impact nature	
Positive	An impact that is considered to represent an improvement on the baseline or introduces a positive change.
Negative	An impact that is considered to represent an adverse change from the baseline, or introduces a new undesirable factor.
Direct impact	Impacts that result from a direct interaction between a planned project activity and the receiving environment/receptors (e.g. between occupation of a site and the pre-existing habitats or between an effluent discharge and receiving water quality).
Indirect impact	Impacts that result from other activities that are encouraged to happen as a consequence of the Project (e.g. in-migration for employment placing a demand on resources).
Cumulative impact	Impacts that act together with other impacts (including those from concurrent or planned future third party activities) to affect the same resources and/or receptors as the Project.

Assessing significance

There is no statutory definition of '*significance*' and its determination is, therefore, somewhat subjective. However, it is generally accepted that significance is a function of the magnitude of the impact and the likelihood of the impact occurring. The criteria used to determine significance are summarized in *Table 1.2*

Table 1.2 Significance criteria

Impact magnitude	
Extent	*On-site* – impacts that are limited to the boundaries of the rail reserve, yard or substation site. *Local* – impacts that affect an area in a radius of 20km around the development site. *Regional* – impacts that affect regionally important environmental resources or are experienced at a regional scale as determined by administrative boundaries, habitat type/ecosystem. *National* – impacts that affect nationally important environmental resources or affect an area that is nationally important/ or have macro-economic consequences.
Duration	*Temporary* – impacts are predicted to be of short duration and intermittent/occasional. *Short-term* – impacts that are predicted to last only for the duration of the construction period. *Long-term* – impacts that will continue for the life of the Project, but ceases when the Project stops operating. *Permanent* – impacts that cause a permanent change in the affected receptor or resource (e.g. removal or destruction of ecological habitat) that endures substantially beyond the Project lifetime.

Intensity	BIOPHYSICAL ENVIRONMENT: *Intensity can be considered in terms of the sensitivity of the biodiversity receptor (ie. habitats, species or communities).* **Negligible** – the impact on the environment is not detectable. **Low** – the impact affects the environment in such a way that natural functions and processes are not affected. **Medium** – where the affected environment is altered but natural functions and processes continue, albeit in a modified way. **High** – where natural functions or processes are altered to the extent that it will temporarily or permanently cease. ***Where appropriate, national and/or international standards are to be used as a measure of the impact.*** *Specialist studies should attempt to quantify the magnitude of impacts and outline the rationale used.* SOCIO-ECONOMIC ENVIRONMENT: *Intensity can be considered in terms of the ability of project affected people/communities to adapt to changes brought about by the Project.* **Negligible** – there is no perceptible change to people's livelihood **Low** - People/communities are able to adapt with relative ease and maintain pre-impact livelihoods. **Medium** - Able to adapt with some difficulty and maintain pre-impact livelihoods but only with a degree of support. **High** - Those affected will not be able to adapt to changes and continue to maintain-pre impact livelihoods.
Impact likelihood (Probability)	
Negligible	The impact does not occur.
Low	The impact may possibly occur.
Medium	Impact is likely to occur under most conditions.
High	Impact will definitely occur.

Once a rating is determined for magnitude and likelihood, the following matrix can be used to determine the impact significance.

Table 7.5 Example of significance rating matrix

SIGNIFICANCE RATING					
	LIKELIHOOD	**Negligible**	**Low**	**Medium**	**High**
MAGNITUDE	**Negligible**	**Negligible**	**Negligible**	**Low**	**Low**
	Low	**Negligible**	**Negligible**	**Low**	**Low**
	Medium	**Negligible**	**Low**	**Medium**	**Medium**
	High	**Low**	**Medium**	**High**	**High**

In *Table 7.6*, the various definitions for significance of an impact is given.

Table7.6 Significance definitions

Significance definitions	
Negligible significance	An impact of negligible significance (or an insignificant impact) is where a resource or receptor (including people) will not be affected in any way by a particular activity, or the predicted effect is deemed to be 'negligible' or 'imperceptible' or is indistinguishable from natural background variations.
Minor significance	An impact of minor significance is one where an effect will be experienced, but the impact magnitude is sufficiently small (with and without mitigation) and well within accepted standards, and/or the receptor is of low sensitivity/value.

Moderate significance	An impact of moderate significance is one within accepted limits and standards. The emphasis for moderate impacts is on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable (ALARP). This does not necessarily mean that 'moderate' impacts have to be reduced to 'minor' impacts, but that moderate impacts are being managed effectively and efficiently.
Major significance	An impact of major significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors. A goal of the EIA process is to get to a position where the Project does not have any major residual impacts, certainly not ones that would endure into the long term or extend over a large area. However, for some aspects there may be major residual impacts after all practicable mitigation options have been exhausted (i.e. ALARP has been applied). An example might be the visual impact of a development. It is then the function of regulators and stakeholders to weigh such negative factors against the positive factors such as employment, in coming to a decision on the Project.

Once the significance of the impact has been determined, it is important to qualify the **degree of confidence** in the assessment. Confidence in the prediction is associated with any uncertainties, for example, where information is insufficient to assess the impact. Degree of confidence can be expressed as low, medium or high.

Appendix 2 - Minimum Content Requirements for Botanical and Terrestrial Biodiversity Specialist Reports as per Protocol for the Specialist Assessment of Environmental Impacts on Terrestrial Biodiversity (GN 320 of 20 March 2020)

Protocol ref	Botanical and Terrestrial Biodiversity Specialist Assessment Report Content	Section / Page
3.1.1.	contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	Cover, Page 2, & Appendices 3-4
3.1.2.	a signed statement of independence by the specialist;	Pages 3 & 4
3.1.3.	a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	Pages 10-11
3.1.4.	a description of the methodology used to undertake the site verification and impact assessment and site inspection, including equipment and modelling used, where relevant;	Pages 10-11
3.1.5.	a description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations;	Page 11
3.1.6.	a location of the areas not suitable for development, which are to be avoided during construction and operation (where relevant);	28
3.1.7.	additional environmental impacts expected from the proposed development;	N/A
3.1.8.	any direct, indirect and cumulative impacts of the proposed development;	Pages 28-30
3.1.9.	the degree to which impacts and risks can be mitigated;	Pages 29-30
3.1.10.	the degree to which the impacts and risks can be reversed;	Pages 29-30
3.1.11.	the degree to which the impacts and risks can cause loss of irreplaceable resources;	Pages 29-30
3.1.12.	proposed impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	Pages 30-31
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;	N/A
3.1.14.	a substantiated statement, based on the findings of the specialist assessment, regarding the acceptability, or not, of the proposed development, if it should receive approval or not; and	Page 31
3.1.15.	any conditions to which this statement is subjected.	N/A

Appendix 3: Curriculum Vitae: Dr David Jury McDonald Pr.Sci.Nat.

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Profession: Botanist / Vegetation Ecologist / Consultant / Tour Guide

Date of Birth: 7 August 1956

Employment history:

- 19 years with National Botanical Institute (now SA National Biodiversity Institute) as researcher in vegetation ecology.
- Five years as Deputy Director / Director Botanical & Communication Programmes of the Botanical Society of South Africa
- 17 years as private independent Botanical Specialist consultant (Bergwind Botanical Surveys & Tours CC)

Nationality: South African (ID No. 560807 5018 080)
Languages: English (home language) – speak, read and write
Afrikaans – speak, read and write

Membership in Professional Societies:

- South Africa Association of Botanists
- International Association for Impact Assessment (SA)
- South African Council for Natural Scientific Professions (**Ecological Science, Registration No. 400094/06**)
- Field Guides Association of Southern Africa

Key Qualifications:

- Qualified with a M. Sc. (1983) in Botany and a PhD in Botany (Vegetation Ecology) (1995) at the University of Cape Town.
- Research in Cape fynbos ecosystems and more specifically mountain ecosystems.
- From 1995 to 2000 managed the Vegetation Map of South Africa Project (National Botanical Institute).
- Conducted botanical survey work for AfriDev Consultants for the Mohale and Katse Dam projects in Lesotho from 1995 to 2002. A large component of this work was the analysis of data collected by teams of botanists.
- **Director: Botanical & Communication Programmes** of the Botanical Society of South Africa (2000—2005), responsible for communications and publications; involved with conservation advocacy particularly with respect to impacts of development on centres of plant endemism.
- Further tasks involved the day-to-day management of a large non-profit environmental organisation.

- **Independent botanical consultant** (2005 – to present) over 600 projects have been completed related to environmental impact assessments in the Western, Southern and Northern Cape, Karoo and Lesotho. A list of reports (or selected reports for scrutiny) is available on request.

Higher Education

Degrees obtained
and major subjects passed:

B.Sc. (1977), University of Natal, Pietermaritzburg
Botany III
Entomology II (Third year course)

B.Sc. Hons. (1978) University of Natal, Pietermaritzburg
Botany (Ecology /Physiology)

M.Sc. - (Botany), University of Cape Town, 1983.
Thesis title: 'The vegetation of Swartboschkloof, Jonkershoek, Cape Province'.

PhD (Botany), University of Cape Town, 1995.
Thesis title: 'Phytogeography endemism and diversity of the fynbos of the southern Langeberg'.

Certificate of Tourism: Guiding (Culture: Local)
Level: 4 Code: TGC7 (Registered Tour Guide: WC 2969).

Employment Record:

January 2006 – present: Independent specialist botanical consultant and tour guide in own company: **Bergwind Botanical Surveys & Tours CC**
August 2000 - 2005 : Deputy Director, later Director Botanical & Communication Programmes, Botanical Society of South Africa
January 1981 – July 2000 : Research Scientist (Vegetation Ecology) at National Botanical Institute
January 1979—Dec 1980 : National Military Service

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Appendix 4: Curriculum Vitae: Mr Adam Labuschagne

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- 2 Years as Field Manager and Research Officer at Human Wildlife Solutions (HWS).
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Afrikaans (Basic)
Xhosa (Basic)

Membership in Professional Societies:

- South African Wildlife Management Association
- Zoological Society of Southern Africa
- Field Guides Association of Southern Africa
- South African Association of Botanists
- South African Council for Natural Scientific Professions (**Zoological Science & Ecological Science, Registration No. 133686**)

Key Qualifications:

- Qualified with a M. Sc. (2019) in Ecology and Evolutionary Biology at Queen Mary University.
- Botanical field research assisting PhD and Masters Students at University of Stellenbosch in Namaqualand and Cape Flats Sand Fynbos.
- UAV/RPAS License
- Proficiency in R and QGIS with a focus on spatial ecology.

Higher Education

Degrees obtained
and major subjects passed: B.Sc. (Zoology) University of Roehampton, London

M.Sc. - (Ecology and Evolutionary Biology), Queen Mary University, London
Thesis title: 'Using Satellite telemetry to understand the movement ecology and diving behaviour of *Caretta caretta* in the Cape Verde Archipelago'.