PB CONSULT
ENVIRONMENTAL MANAGEMENT SERVICES

BOTANICAL SCAN & TERRESTRIAL BIODIVERSITY COMPLIANCE STATEMENT

DARLING SOLAR PROJECT

THE PROPOSED ESTABLISHMENT OF A SOLAR PHOTOVOLTAIC FACILITY ON A PORTION OF ERF 551, DARLING
SWARTLAND MUNICIPALITY, WESTERN CAPE PROVINCE.

PREPARED FOR:
ENVIROAFRICA

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EXECUTIVE SUMMARY

The Swartland Municipality would like to establish a 19.9 MW solar photovoltaic facility on a portion of Erf 511, just west of the town of Darling (Western Cape Province), to reduce the impact of the energy crisis on the town. Erf 511 belongs to the Swartland Municipality and is surrounded by agricultural land to the north, west and south and residential development (the town of Darling) to the east. The proposed solar PV facility will be located on a small portion (about 54 ha) of the larger Erf 511 (371.36 ha). Erf 511 is zoned "Split Zoning: Commonage land", currently used for agriculture (dry land, commercial annual crops & grazing).

VEGETATION TYPE & STATUS

According to the South African vegetation map (2018) (Mucina & Rutherford, 2006), the study area would originally have been covered by the **endangered** Swartland Granite Renosterveld vegetation type (Figure 7).

LAND-USE

The property is Municipal land, zoned "Split Zoning: Commonage land" and has been used for agriculture (commercial annual crops & grazing) over a long period of time. At present it is used for grazing (lying fallow).

VEGETATION ENCOUNTERED

Swartland Granite Renosterveld is described as a mosaic of grasslands/herblands and medium dense, microphyllous shrublands dominated by renosterbos (with groups of small trees and tall shrubs associated with heuweltjies and rock outcrops). The site visit confirmed that the study area had been transformed as a result of cultivation over a long period of time. The indigenous vegetation had been transformed and reduced to a low herbaceous cover dominated by widespread weedy plants in combination with hardy pioneer species or (often disturbance indicator species). On the edges of the old fields, and occasionally within the study, a few hardy pioneer shrub were sometimes observed (all of them hardy species and often disturbance indicator species such as *Galenia africana*).

The study area does not contain any intact natural vegetation of any significance and had been cultivated over a long period of time (Photo 1 to Photo 8).

CONSERVATION PRIORITY AREAS

According to the 2017, Western Cape Biodiversity Spatial Plan (WCBSP) the study area might impact on ecological support areas (ESA 2) and critical biodiversity areas (CBA 1) associated with the small seasonal watercourse running to the north of the study area through Erf 511 (CapeNature, 2017) (Figure 3)**.**

However, the footprint for the proposed development area has been chosen to avoid this watercourse and the watercourse itself had been degraded (and was probably ploughed as part of the agricultural fields in the past).

PROTECTED PLANT SPECIES

No red-data or any protected plant species were observed within the proposed footprint (refer to Heading 4.4).

- According to the NEMA EIA screening tool report for this project (Refer to Appendix 1), the relative plant species sensitivity is considered "**High Sensitivity"**, because the original vegetation type is classified as endangered and specifically because of the potential that a number of sensitive plants is known to have a distribution range within the broader area or this vegetation type.

Unfortunately, Erf 511 had been under cultivation (dry-land commercial annual crops) over a long period of time and renosterveld, once cultivated, will not restore itself for many generations (if ever). Only a few hardy or indigenous pioneer species had managed to survive the continual impact of agriculture, grazing, and altered fire regimes. None of the species listed in the screening report were observed. Because of the degraded state

of the study area, it is considered unlikely that the proposed solar facility will result in any significant additional impact on sensitivity plants.

As a result, the Plant Species theme for this study area is rated as **Low Sensitive**.

FAUNA & AVI-FAUNA

Historically several large and small mammals would have been expected to occur within the Fynbos / Renosterveld vegetation of the Swartland area (although not in large numbers). Fynbos does not support a high number of birds , but all six bird species endemics to the south-west Cape are fynbos species. On the other hand, Fynbos supports large numbers of butterfly species, many of which, are now at risk, especially the myrmecophilous (ant associated) butterflies from the family Lycaenidae, because of ongoing disturbances to their preferred habitat (often small areas). Although fynbos is not particularly rich in reptiles and amphibians, many of the species living there are both endemic and threatened. The very rare geometric tortoise is found in only a few surviving fynbos areas and is regarded as the world's second rarest tortoise. The Cape has more than half of South Africa's frog species. Furthermore, of the 62 different frogs occurring here, 29 are endemic being found nowhere else on earth.

According to the **NEMA EIA Sensitivity** scan for the site (Appendix 1) the Animal Species Theme Sensitivity is **High Sensitive** because of the potential presence of several bird species (mostly vulnerable or endangered birds-of-prey), two butterfly species, one beetle and one grasshopper species listed in Table 8. Unfortunately, because of the long history of agriculture and the transformed nature of the veld (and other reasons listed in Table 8) it is considered highly unlikely that the proposed development will result in any significant additional impact on any of these species. Realistically, only the Lanner Falcon might still hunt over this area, and the bladder grasshopper might still be found in the small reserve to the south of the property (it is unlikely to have survived the ongoing cultivation periods – even though its hostplant was still encountered within the study area).

As a result, the animal species theme sensitivity for this project is considered to be **Low Sensitive**.

REHABILITATION OPTIONS

Because of the long history of cultivation and other associated farming practices on the property (and its immediate surroundings) it is considered highly unlikely that natural veld would ever be able to re-establish itself in this area without human intervention. It is well known that renosterveld is unlikely to restore itself, once cultivated. Rehabilitation would only be possible if the study area is actively replanted and re-seeded with indigenous vegetation from surrounding intact veld and then managed as a conservation area. In this case, rehabilitation and conservation of the site is not considered a viable option as there would be many other areas in better condition more worthy of conservation efforts.

TERRESTRIAL BIODIVERSITY

According to the **NEMA EIA Sensitivity** scan for the site (Appendix 1) the Terrestrial Biodiversity Theme Sensitivity is **VERY HIGH SENSITIVE** because of the potential impact on ecological support areas (ESA's), critical biodiversity areas (CBA's), endangered Swartland Granite Renosterveld vegetation type and sensitive fauna & flora species.

The Terrestrial biodiversity assessment (Table 9) aims to take all the discussion in this report into account, including the existing status of the study area. According, Table 9 the main impacts associated with the proposed development will be:

- A potential impact on a small non-perennial watercourse and its associated ESA and CBA corridors;
- A potential low impact on bird species (specifically the Lanner Falcon).

However, based on the Terrestrial Biodiversity Evaluation for this study (Table 9), the potential accumulative impact is considered to a **LOW negative** (even without mitigation).

It is considered highly unlikely that the development will contribute significantly to any of the following:

- Significant loss of vegetation type and associated habitat.
- Loss of ecological processes (e.g., migration patterns, pollinators, river function etc.) due to construction and operational activities.
- Loss of local biodiversity and threatened species.
- Loss of ecosystem connectivity.

As a result, the Terrestrial Biodiversity Theme Sensitivity for the proposed project is considered **LOW SENSITIVE**.

MAIN CONCLUSION

It is the opinion of the author that a full botanical assessment will not produce any significant additional information. Since there are not true sensitive areas in terms of vegetation remaining within the study area, the sensitivity map focuses on the protection of the already heavily degraded watercourse to the north of the site (with its associated CBA and ESA areas) (Refer to Figure 8).

WITH THE AVAILABLE INFORMATION IT IS RECOMMENDED THAT THE PROJECT BE APPROVED.

RECOMMENDATIONS

The study area is considered transformed with no intact or natural veld of any significance remaining. However, potential additional impacts on the watercourse to the north (even though degraded) should be minimised.

The following recommendations aims at the protection of seasonal watercourse (refer to Figure 8).

- The aquatic CBA area shown in the sensitivity map Figure 8, must be considered a no-go area (to be protected).
- Indiscriminate clearing of any area outside of the footprint must be avoided.

DETAILS OF THE AUTHOR

This is a specialist report compiled by Peet Botes from PB Consult.

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INDEPENDENCE & CONDITIONS

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

RELEVANT QUALIFICATIONS & EXPERIENCE OF THE AUTHOR

Mr. Peet Botes holds a BSc. (Hons.) degree in Plant Ecology from the University of Stellenbosch (Nature Conservation III & IV as extra subjects). Since qualifying with his degree, he had worked for more than 20 years in the environmental management field, first at the Overberg Test Range (a Division of Denel) managing the environmental department of OTR and being responsible for developing and implementing an ISO14001 environmental management system, ensuring environmental compliance, performing environmental risk assessments with regards to missile tests and planning the management of the 26 000 ha of natural veld, working closely with CapeNature (De Hoop Nature Reserve).

In 2005 he joined Enviroscientific, an independent environmental consultancy specializing in wastewater management, botanical and biodiversity assessments, developing environmental management plans and strategies, environmental control work as well as doing environmental compliance audits and was also responsible for helping develop the biodiversity part of the Farming for the Future audit system implemented by Woolworths. During his time with Enviroscientific he performed more than 400 biodiversity and environmental legal compliance audits.

During 2010 he joined EnviroAfrica in order to move back to the biodiversity aspects of environmental management. Experience with EnviroAfrica includes NEMA EIA applications, environmental management plans for various industries, environmental compliance audits, environmental control work as well as more than 70 biodiversity & botanical specialist studies.

Towards the end of 2017, Mr Botes started his own small environmental consulting business focusing on biodiversity & botanical assessments, biodiversity management plans and environmental compliance audits.

Mr. Botes is a registered Professional Botanical, Environmental and Ecological Scientists at SACNASP (South African Council for Natural Scientific Professions) as required in terms of Section 18(1)(a) of the Natural Scientific Professions Act, 2003, since 2005.

DECLARATION OF INDEPENDENCE

THE INDEPENDENT PERSON WHO COMPILED A SPECIALIST REPORT OR UNDERTOOK A SPECIALIST PROCESS

I Petrus, Jacobus, Johannes Botes, as the appointed independent specialist hereby declare that I:

- act/ed as the independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014, as amended, and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2014 (specifically in terms of regulation 13 of GN No. R. 326) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- have ensured that the names of all interested and affected parties that participated in terms of the specialist input/study were recorded in the register of interested and affected parties who participated in the public participation process;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; and
- am aware that a false declaration is an offence in terms of regulation 13 of GN No. R. 326.

Note: The terms of reference must be attached.

Signature of the specialist:

PB Consult (Sole Proprietor)

Name of company:

19 October 2023

Date:

CONTENTS

LIST OF FIGURES

LIST OF PHOTOS

ABBREVIATIONS

BAR	Basic Assessment Report
CBA	Critical biodiversity area (in terms of the 2017 City of Cape Town Biodiversity Network)
DENC	Department of Environment and Nature Conservation
EA	Environmental Authorization (Record of Decision)
EAP	Environmental assessment practitioner
ECO	Environmental Control Officer
EIA	Environmental impact assessment
EMP	Environmental Management Plan or Program
EMS	Environmental management system
EN	Endangered
ESA	Ecological support area (in terms of the 2017 City of Cape Town Biodiversity Network)
LT	Least Threatened
NEMA	National Environmental Management Act, 1998 (Act no. 107 of 1998)
VU	Vulnerable

1. INTRODUCTION

The Swartland Municipality would like to establish a 19.9 MW solar photovoltaic facility on a portion of Erf 511, just west of the town of Darling (Western Cape Province), to reduce the impact of the energy crisis on the town. Erf 511 belongs to the Swartland Municipality and is surrounded by agricultural land to the north, west and south and residential development (the town of Darling) to the east. The proposed solar PV facility will be located on a small portion (about 54 ha) of the larger Erf 511 (371.36 ha). Erf 511 is zoned "Split Zoning: Commonage land", currently used for agriculture (dry land, commercial annual crops & grazing).

According to the vegetation map of South Africa (2018), the study area overlaps an area that used to be covered by Swartland Granite Renosterveld (Figure 7), a vegetation type that has been classified as **endangered** in terms of the revised national list of ecosystems that are threatened and in need of protection (2022). A small (degraded) seasonal watercourse runs through the property, but to the north of the proposed footprint area. The development might impact on ecological support areas (ESA 2) and critical biodiversity areas (CBA 1) associated with this small watercourse (Western Cape Biodiversity Spatial Plan, 2017). Historical Google images shows that the site had already been cultivated (ploughed) during 2003 and is still used for agriculture (commercial crops & grazing). At present it is used for grazing (lying fallow).

The site visit confirmed that the study area had been transformed in terms of remaining natural veld. The vegetation on site had been reduced to a low cover of weedy herbaceous species and hardy bulbs with the occasional hardy shrub scattered throughout the site. The remaining vegetation is typical of previously ploughed fields with a long history of agriculture (which is not surprising considering that this area had been subject to European settlement, agriculture, alien infestation and changes in fire regime, for more than 200 years).

The DFFE screening report for the proposed site, compiled by Mr Bernard de Witt from EnviroAfrica on the 10th of July 2023 (Appendix 1), identifies the following potential environmental sensitivities:

- The relative Animal species theme sensitivity is considered of **High Sensitivity**;
- The relative Plant species theme sensitivity is considered of **High Sensitivity**;
- The relative Terrestrial Biodiversity theme sensitivity is considered of **Very High Sensitivity**.

A freshwater specialist had been appointed to evaluate the aquatic biodiversity theme (which is also considered **Very Hight Sensitive**).

1.1. LEGISLATION GOVERNING THIS STUDY

This is a specialist report, compiled in terms of:

- The National Environmental Management Act, Ac. 107 of 1998 (NEMA);
- The "Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes" in terms of Sections 24(5)(a) and (h) and 44 of the NEMA (Government Notice No. 320 of 20 March 2020).
- The National Environmental Management: Biodiversity Act, Act 10 of 2004, which allows for the conservation of endangered ecosystems and restriction of activities according to the status of the ecosystem;

- The National Forest Act, Act 84 of 1998, which provide a list of protected trees species in SA.

1.2. TERMS OF REFERENCE

Since the study area used to be covered by a vegetation type now considered endangered and might impact on a CBA and EAS, the EAP advised a pre-cautionary approach to the application. As a result, PB Consult was appointed by EnviroAfrica to perform a botanical scan of the study area to evaluate the site in terms of botanical significance.

The terms of reference for this appointment were to:

- Perform a site visit and evaluate and verify the site sensitivity in terms of the Biodiversity Protocol for specialist assessment.
- Determine and record the position of any plant species of special significance (e.g., protected species, or rare or endangered species) that should be avoided or that may require "search & rescue" intervention.
- Locate and record sensitive areas from a terrestrial biodiversity perspective within the proposed development footprint that may be interpreted as obstacles to the proposed development.
- Map a sensitive areas and make recommendations on optimal placement (in terms of minimum environmental impact) of the proposed sand mine.
- Make recommendations on impact minimization where applicable

1.3. ACTIVITY DESCRIPTION

The Swartland Municipality would like to establish a 19.9 MW Photovoltaic (PV) Solar facility on a 54 ha portion of Erf 511, Darling. The proposed development is likely to result in further earthworks (levelling) within the 54 ha area.

2. STUDY AREA

2.1. LOCATION & LAYOUT

Darling is a small town within the Swartland Municipal area, to the west of Malmesbury and the north of Atlantis (within the Western Cape Province) (Figure 1). The western portion of Erf 551 is located, just west of the urban edge of Darling. The property is municipal land which falls within the Darling urban edge as defined by the Local Municipality. The remainder of Erf 551 is about 371.36 ha in size. The proposed development will impact on a 54 ha portion of the property.

The study area refers to an area of about 60 ha, which had been evaluated as part of this study (Refer to the red area in Figure 2). Figure 2 gives an overview of the study area (red) in relation to the town of Darling. It also shows the location of watercourses in close proximity to the proposed development. A small seasonal drainage line runs just north of the proposed PV Solar site.

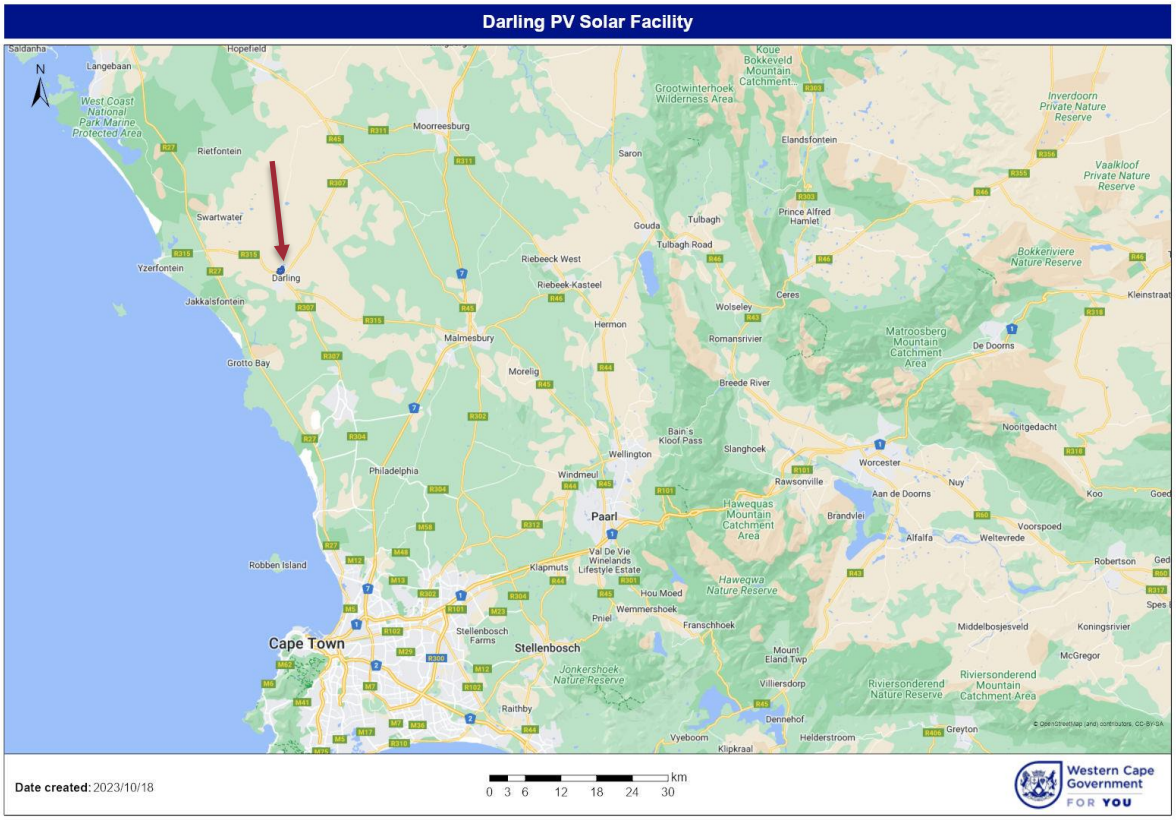

Figure 1: A map showing the location of the town of Darling in the Western Cape Province

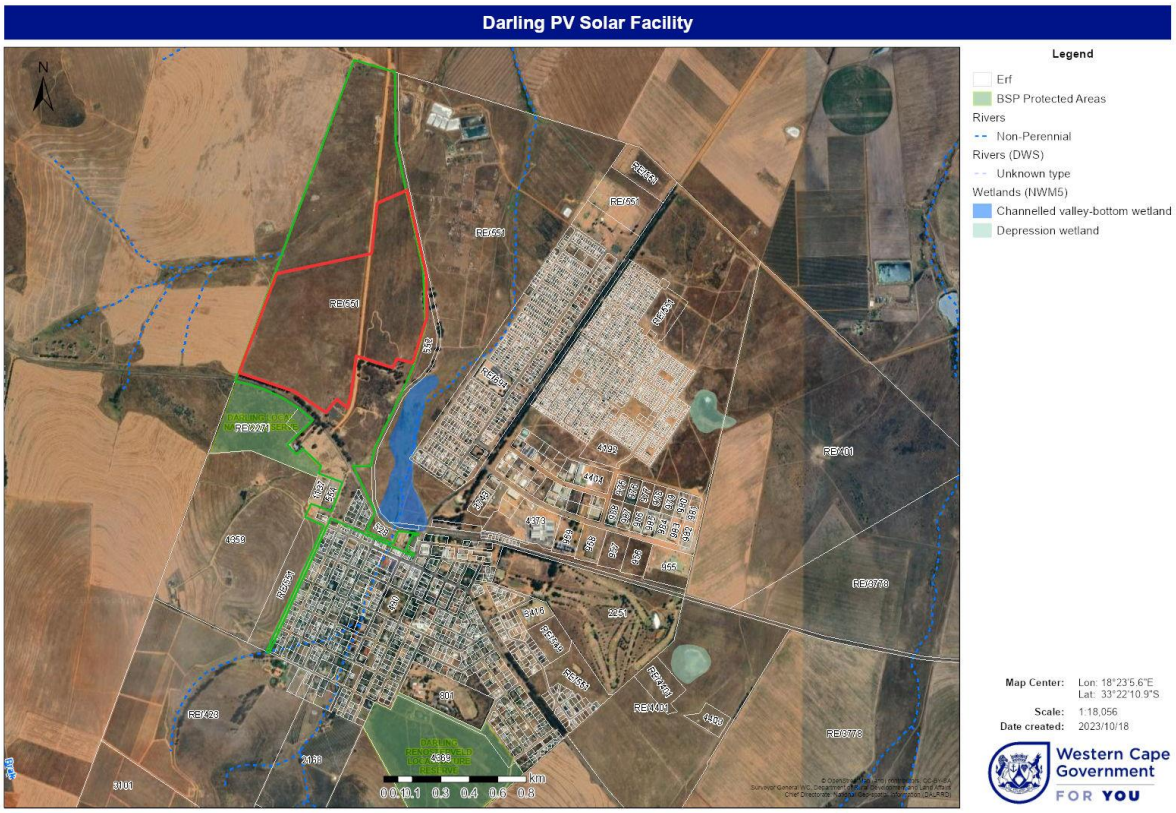

Figure 2: CapeFarmMapper image showing the location of the study area (red) in western portion of Erf 551 (green).

2.2. CRITICAL BIODIVERSITY AREAS MAPS

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

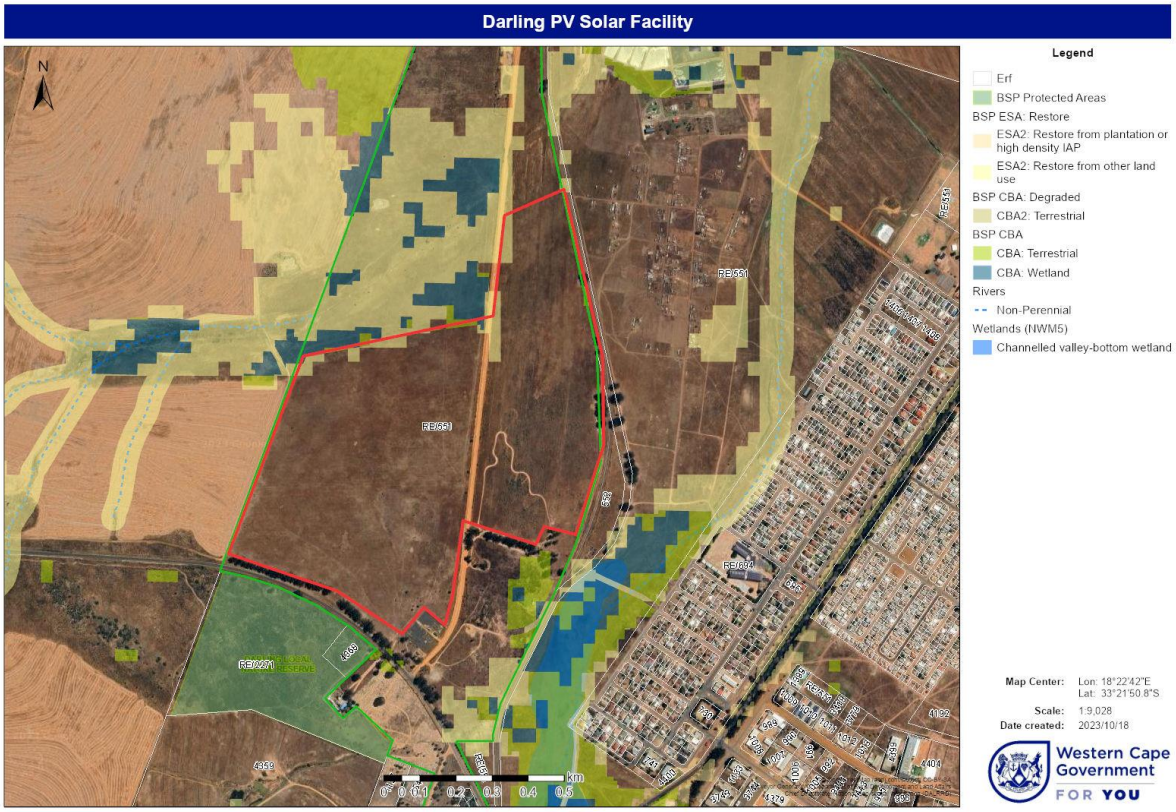

Figure 3: Western Cape Biodiversity Spatial Plan (2017) showing the study area and associated critical biodiversity areas.

According to the 2017, Western Cape Biodiversity Spatial Plan (WCBSP) the study area might impact on ecological support areas (ESA 2) and critical biodiversity areas (CBA 1) associated with the small seasonal watercourse running to the north of the study area through Erf 511 (CapeNature, 2017) (Figure 3).

2.3. LANDUSE

According to the 2020, DEA Land Cover (9-class) map of South Africa, the study area is considered cultivated land used for the cultivation of commercial annual crops on drylands (Refer to Figure 4). This was confirmed by the site visit. It also confirmed that the study area (and its immediate surroundings) does not support any remaining natural veld of any consequence.

Historical Google images (Figure 5) show that the site was already cultivated during 2003 (the earliest historical Google image covering the terrain) and were physically cultivated (ploughed) until recently.

At present it is used for livestock grazing (lying fallow). At the time of the site visit the western portion of the site was grazed by horses.

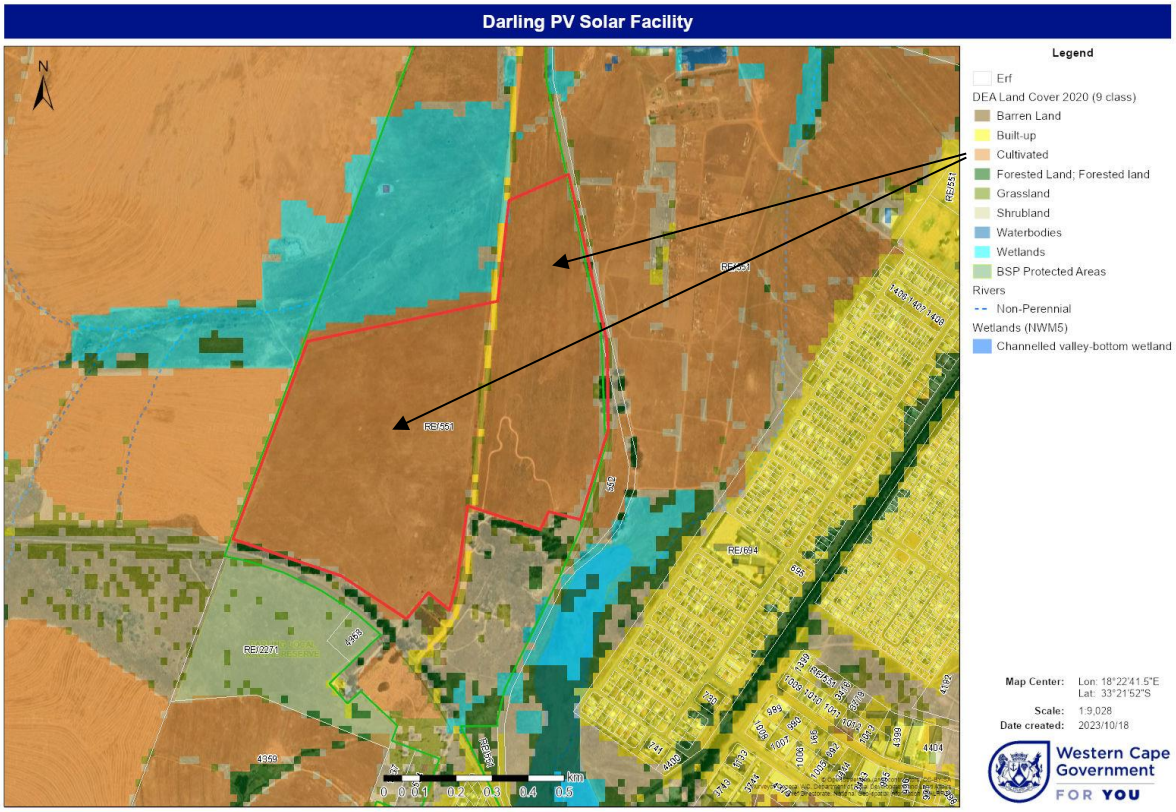

Figure 4: Land Cover 9-class (DEA, 2020) showing the expected land cover within the study area.

Figure 5: Historical Google Image (2003), showing the cultivated and degraded status of the study area at that time.

3. APPROACH & METHODOLOGY

3.1. DESKTOP ANALYSIS

The first step of the study was to conduct a desktop analysis of the study area and its immediate surroundings. Using the DFFE screening tool report as basis, spatial information from online databases such as SANBI BGIS and Google Earth were used to evaluate the site in terms of vegetation, obvious differences in landscape (e.g., variations in soil type, rocky outcrops etc.) or vegetation densities , which might indicate differences in plant community or species composition, critical biodiversity areas and other terrestrial biodiversity features as identified in the screening tool.

This information was used to prepare a study area map, which is used as a reference during the physical site visit. Plant species lists were prepared, and species of special significance were flagged.

3.2. SITE SENSITIVITY VERIFICATION

The fieldwork for project was carried out on the 21st of September 2023. The site survey was conducted over a 4-hour period, by walking the site and sampling the vegetation, using a modified approach, based on the Braun-Blanquet vegetation survey method (Werger, 1974).

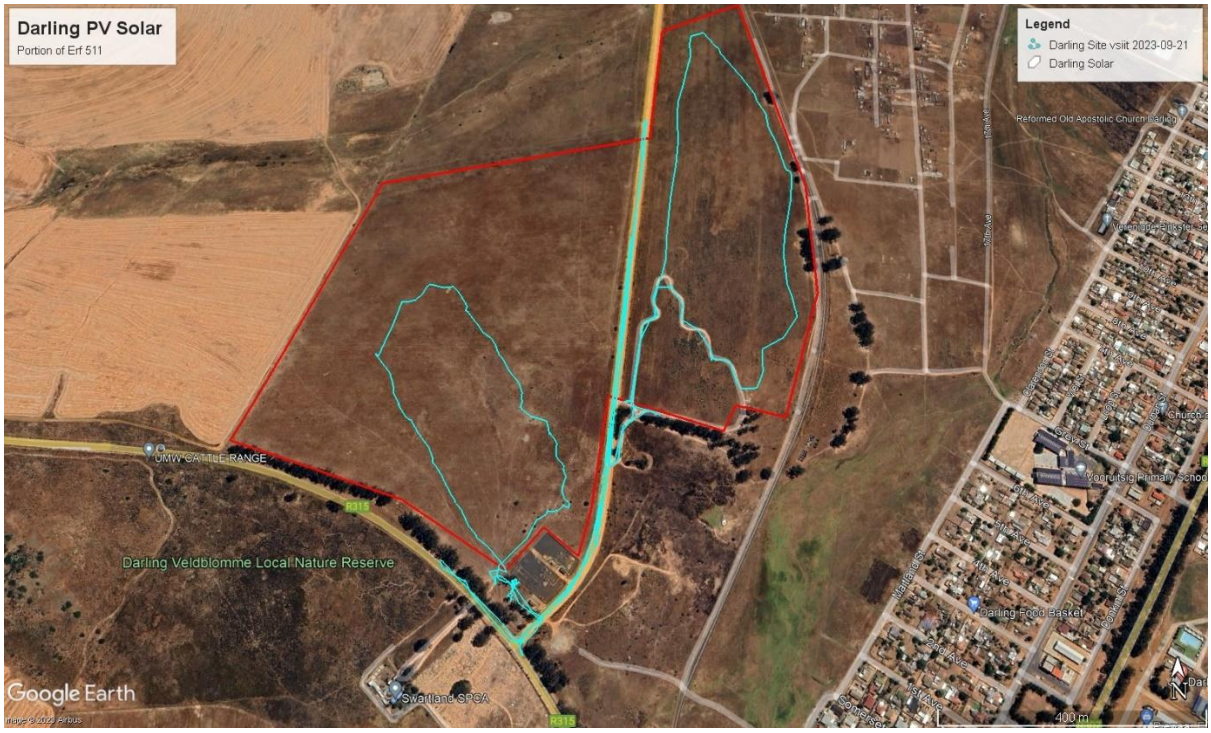

Figure 6: Google overview, showing the study area and the routes walked during the site visit.

Protected or other special plants and any terrestrial feature of significance was, marked by waypoints and/or on the study map, and photographed (Figure 6). A hand-held Garmin GPSMAP 62s was used to track the sampling route and for recording waypoints. During the survey notes, and photographic records were collected. All efforts were made to ensure that any variation in vegetation or soil

condition, which might indicate special botanical features (e.g., rocky outcrops, watercourses or heuweltjies), were visited. Efforts was also made to ensure that the plant species list was as complete as possible.

3.3. LIMITATIONS, ASSUMPTIONS AND UNCERTAINTIES

The findings are based on a one-day site visit (not long-term repetitive sampling), which means that it is likely that some plant species might have been missed. However, the timing of the site visit was chosen specifically to overlap the spring flowering season for Renosterveld (which is known for its rich bulb diversity). The Swartland (including the study area) also received excellent winter rains with regular follow-ups, which would have improved the conditions of any remaining natural veld and would have prompted seasonal annuals and bulbs. However, it was still very clear that in terms of botanical status, the study area had been severely degraded (basically transformed). Essentially all perennial plants were identifiable and a good understanding of the status of the vegetation and plant species in the study areas were obtained and confidence in the findings are high. There should be no limiting factors which could significantly alter the outcome of this study (especially since the site is basically transformed). It is unlikely that a full botanical assessment will result in any additional findings that would have a significant impact on the outcome.

3.4. IMPACT ASSESSMENT METHOD

The concept of environmental impact assessment in terms of the National Environmental Management Act, Act 107 of 1998 (NEMA) and the Environmental Impact Assessment (EIA) was developed to identify and evaluate the nature of potential impact to determine whether an activity is likely to cause significant environmental impact on the environment. The concept of significance is at the core of impact identification, evaluation and decision making, but despite this the concept of significance and the method used for determining significance remains largely undefined and open to interpretation (DEAT, 2002).

The objective of this study was to evaluate the remaining biodiversity of the study area to identify significant environmental features which might be impacted by of the proposed activity. The Ecosystem Guidelines for Environmental Assessment (De Villiers *et. al*., 2005), were used to evaluate the botanical significance of the property with emphasis on:

- Significant ecosystems
    - Threatened or protected ecosystems
    - Special habitats
    - Corridors and or conservancy networks
- Significant species
    - Threatened or endangered species
    - Protected species.

3.4.1. DETERMINING SIGNIFICANCE

Determining impact significance from predictions of the nature of the impact has been a source of debate and will remain a source of debate. The author used a combination of scaling and weighting methods to determine significance based on a simple formula. The formula used is based on the method proposed by Edwards (2011). However, the criteria used were adjusted to suite its use for botanical assessment. In this document significance rating was evaluated using the following criteria.

Significance = Conservation Value x (Likelihood + Duration + Extent + Severity) (Edwards 2011)

3.4.2. CRITERIA USED

***Conservation value*:** Conservation value refers to the intrinsic value of an attribute (e.g., an ecosystem, a vegetation type, a natural feature or a species) or its relative importance towards the conservation of an ecosystem or species or even natural aesthetics. Conservation status is based on habitat function, its vulnerability to loss and fragmentation or its value in terms of the protection of habitat or species (Refer to Table 1 for categories used).

Likelihood refers to the probability of the specific impact occurring because of the proposed activity (Refer to Table 2, for categories used).

Duration refers to the length in time during which the activity is expected to impact on the environment (Refer to Table 3).

Extent refers to the spatial area that is likely to be impacted or over which the impact will have influence, should it occur (Refer to Table 4).

Severity refers to the direct physical or biophysical impact of the activity on the surrounding environment should it occur (Refer to Table 5).

Table 1: Categories used for evaluating conservation status.

CONSERVATION VALUE	
Low (1)	The attribute is transformed, degraded not sensitive (e.g. Least threatened), with unlikely possibility of species loss.
Medium/low (2)	The attribute is in good condition but not sensitive (e.g. Least threatened), with unlikely possibility of species loss.
Medium (3)	The attribute is in good condition, considered vulnerable (threatened), or falls within an ecological support area or a critical biodiversity area, but with unlikely possibility of species loss.
Medium/high (4)	The attribute is considered endangered or, falls within an ecological support area or a critical biodiversity area, or provides core habitat for endemic or rare & endangered species.
High (5)	The attribute is considered critically endangered or is part of a proclaimed provincial or national protected area.

Table 2: Categories used for evaluating likelihood.

LIKELIHOOD	
Highly Unlikely (1)	Under normal circumstances it is almost certain that the impact will not occur.
Unlikely (2)	The possibility of the impact occurring is very low, but there is a small likelihood under normal circumstances.
Possible (3)	The likelihood of the impact occurring, under normal circumstances is 50/50, it may or it may not occur.
Probable (4)	It is very likely that the impact will occur under normal circumstances.
Certain (5)	The proposed activity is of such a nature that it is certain that the impact will occur under normal circumstances.

Table 3: Categories used for evaluating duration.

DURATION	
Short (1)	Impact is temporary and easily reversible through natural process or with mitigation. Rehabilitation time is expected to be short (1-2 years).
Medium/short (2)	Impact is temporary and reversible through natural process or with mitigation. Rehabilitation time is expected to be relative short (2-5 years).
Medium (3)	Impact is medium-term and reversible with mitigation but will last for some time after construction and may require ongoing mitigation. Rehabilitation time is expected to be longer (5-15 years).
Long (4)	Impact is long-term and reversible but only with long term mitigation. It will last for a long time after construction and is likely to require ongoing mitigation. Rehabilitation time is expected to be longer (15-50 years).
Permanent (5)	The impact is expected to be permanent.

Table 4: Categories used for evaluating extent.

EXTENT	
Site (1)	Under normal circumstances the impact will be contained within the construction footprint.
Property (2)	Under normal circumstances the impact might extent outside of the construction site (e.g., within a 2 km radius), but will not affect surrounding properties.
Surrounding properties (3)	Under normal circumstances the impact might extent outside of the property boundaries and will affect surrounding landowners or –users, but still within the local area (e.g., within a 50 km radius).
Regional (4)	Under normal circumstances the impact might extent to the surrounding region (e.g., within a 200 km radius), and will impact on landowners in the larger region (not only surrounding the site).
Provincial (5)	Under normal circumstances the effects of the impact might extent to a large geographical area (>200 km radius).

Table 5: Categories used for evaluating severity.

SEVERITY	
Low (1)	It is expected that the impact will have little or no affect (barely perceptible) on the integrity of the surrounding environment. Rehabilitation not needed or easily achieved.
Medium/low (2)	It is expected that the impact will have a perceptible impact on the surrounding environment, but it will maintain its function, even if slightly modified (overall integrity not compromised). Rehabilitation easily achieved.
Medium (3)	It is expected that the impact will have an impact on the surrounding environment, but it will maintain its function, even if moderately modified (overall integrity not compromised). Rehabilitation easily achieved.
Medium/high (4)	It is expected that the impact will have a severe impact on the surrounding environment. Functioning may be severely impaired and may temporarily cease. Rehabilitation will be needed to restore system integrity.
High (5)	It is expected that the impact will have a very severe to permanent impact on the surrounding environment. Functioning irreversibly impaired. Rehabilitation often impossible or unfeasible due to cost.

3.4.3. SIGNIFICANCE CATEGORIES

The formal NEMA EIA application process was developed to assess the significance of impacts on the surrounding environment (including socio-economic factors), associated with any specific development proposal to allow the competent authority to make informed decisions. Specialist studies must advise the environmental assessment practitioner (EAP) on the significance of impacts in his field of specialty. To do this, the specialist must identify all potentially significant environmental impacts, predict the nature of the impact, and evaluate the significance of that impact should it occur.

Potential significant impacts are evaluated, using the method described above, to determine its potential significance. The potential significance is then described in terms of the categories given in Table 6. Mitigation options are evaluated, and comparison is then made (using the same method) of potential significance before mitigation and potential significance after mitigation (to advise the EAP).

Table 6: Categories used to describe significance rating (adjusted from DEAT, 2002)

SIGNIFICANCE	DESCRIPTION
Insignificant or Positive (4-22)	There is no impact, or the impact is insignificant in scale or magnitude because of low sensitivity to change or low intrinsic value of the site, or the impact may be positive.
Low (23-36)	An impact barely noticeable in scale or magnitude because of low sensitivity to change or low intrinsic value of the site or will be of very short-term or is unlikely to occur. Impact is unlikely to have any real effect and no or little mitigation is required.
Medium Low (37-45)	Impact is of a low order and therefore likely to have little real effect. Mitigation is easily achieved. Social, cultural, and economic activities can continue unchanged, or impacts may have medium to short term effects on the social and/or natural environment within site boundaries.
Medium (46-55)	Impact is real, but not substantial. Mitigation is both feasible and easily possible but may require modification of the project design or layout. Social, cultural, and economic activities of communities may be impacted, but can continue (albeit in a different form). These impacts will usually result in medium to long term effect on the social and/or natural environment, within site boundary.
Medium high (56-63)	Impact is real, substantial, and undesirable, but mitigation is feasible. Modification of the project design or layout may be required. Social, cultural, and economic activities may be impacted, but can continue (albeit in a different form). These impacts will usually result in medium to long-term effect on the social and/or natural environment, beyond site boundary within local area.
High (64-79)	An impact of high order. Mitigation is difficult, expensive, time-consuming or some combination of these. Social, cultural, and economic activities of communities are disrupted and may come to a halt. These impacts will usually result in long-term change to the social and/or natural environment, beyond site boundaries, regional or widespread.
Unacceptable (80-100)	An impact of the highest order possible. There is no possible mitigation that could offset the impact. Social, cultural, and economic activities of communities are disrupted to such an extent that these come to a halt. The impact will result in permanent change. Very often these impacts are un-mitigatable and usually result in very severe effects, beyond site boundaries, national or international.

4. THE VEGETATION

According to the South African vegetation map (2018) (Mucina & Rutherford, 2006), the study area would originally have been covered by Swartland Granite Renosterveld (Figure 7). **Swartland Granite Renosterveld** is considered "**endangered**" (having experienced extensive spatial decline of approximately 83% since 1750, with high rates of habitat loss since 1990, with ongoing biotic disruption from invasive species and overgrazing), in terms of the "*Revised List of ecosystems that are threatened and in need of protection*" (GN 2747 of 18 November 2022), promulgated in terms of the National Environmental Management Biodiversity Act, Act 10 of 2004.

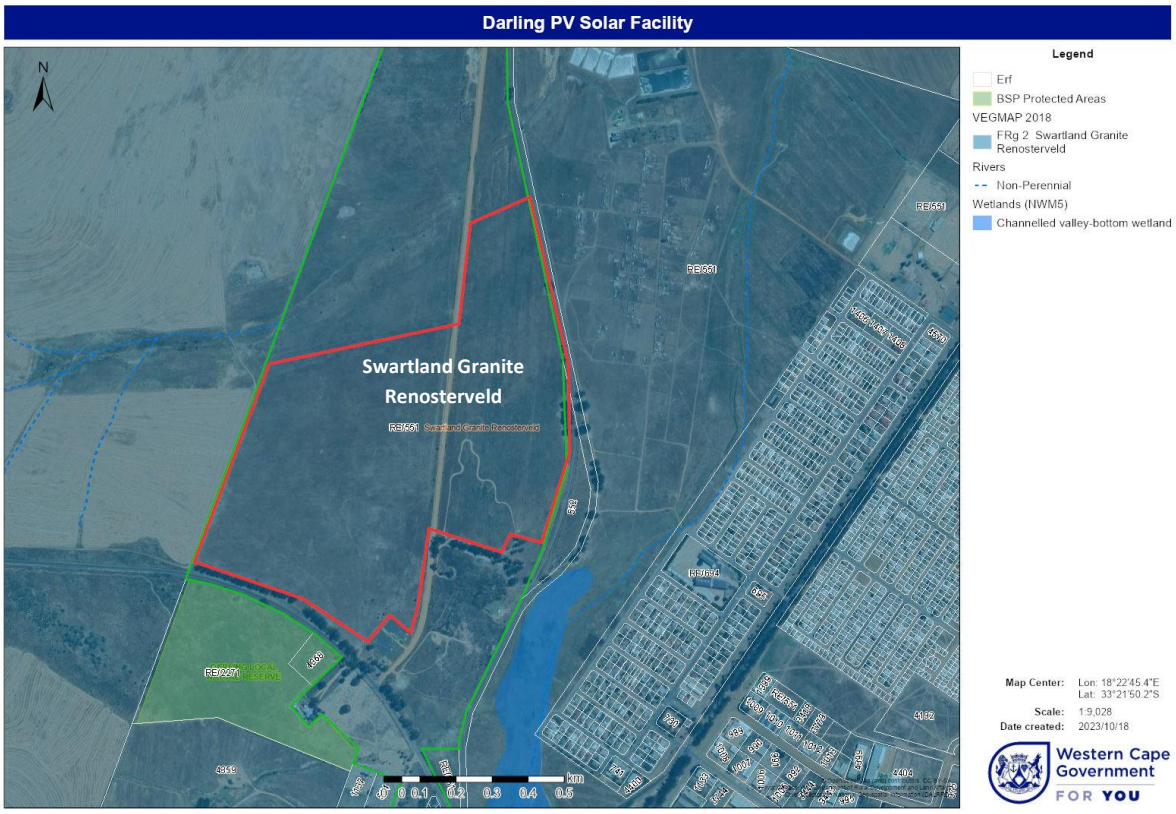

Figure 7: Vegetation map of South Africa (2018), showing the expected vegetation in the vicinity of the footprint.

Mucina & Rutherford (2006) describe Swartland Granite Renosterveld as a mosaic of grasslands/herblands and medium dense, microphyllous shrublands dominated by renosterbos, with groups of small trees and tall shrubs associated with heuweltjies and rock outcrops, occurring on undulating plains and moderate foot slopes of the mountains.

4.1. THE VEGETATION IN CONTEXT

Due to its relatively flat topography, fertile soils, and proximity to Cape Town, the Swartland became established as a wheat-growing area around the mid-1700s. In the late 1800s, when gold and diamonds were discovered upcountry, farming in the region expanded significantly. During this time the Swartland became an almost uninterrupted agricultural area. Renosterveld is a part of the Fynbos Biome but does not include the three major families that typify Fynbos. Proteaceae, Ericaceae and

Restionaceae are rarely present or entirely absent.

Renosterveld has long been the least understood component of the Fynbos Biome, with very little known of its functioning and ecological requirements. It is, however becoming increasingly appreciated for its uniqueness and high species diversity, especially geophytes (Jacobs & Jangle, 2008). Four of the 30 recognized types of renosterveld occur in the Swartland, namely Swartland Shale, Granite, Silcrete and Alluvium Renosterveld. Three of these types are classified as Critically Endangered and the fourth as Vulnerable. The South African Red List (2020) states that Swartland Shale Renosterveld contains the highest concentration of threatened plant species: 214 species in total, 25 of which are endemic to this vegetation type. Historically, Swartland Granite Renosterveld was next most widespread vegetation type in the Swartland. A very prominent feature of Swartland renosterveld is its heuweltjies (earth mounds). These are the distinctive circular patches or 'spots' in the veld that give the Tygerberg its name (Mucina & Rutherford, 2006). The formation these *heuweltjies* is attributed to harvester termites (Van Wyk & Smith, 2001). . These patches are subject to constant disturbance by termites and their predators, and the on-going transportation of plant material by termites to the *heuweltjies* results in nutrient enrichment mounds (Mucina & Rutherford, 2006).

Swartland Granite Renosterveld occurs on sandy to loamy soils delivered from Cape Granite and can retain a considerable amount of moisture during the winter and spring. Almost 80% of this vegetation type had been transformed due to agriculture (it being prime quality land) and by urban sprawl. Hence the conservation target of 26% remains unattainable. Only very small portions (0.5%) enjoy statutory protection. Alien grasses are particularly pervasive, the most important being *Lolium multiflorum*, *Avena fatua* and *Bromus diandrus*. Alien woody species include *Acacia saligna*, *Pinus pinaster* as well as various species of *Eucalyptus* (Cape E-news, 10-07-2018).

A further important threat to biodiversity conservation in lowland vegetation is invasive alien species. The Core Cape Floristic Subregion is particularly susceptible to invasion by alien trees, mostly species of Australian *Acacia*, Hakea and *Eucalyptus*, and pines from the Northern Hemisphere. Many of these trees are considered ecosystem transformers as they out-compete the indigenous vegetation and alter ecosystem processes, such as nutrient cycling, fire, and the hydrological regime.

4.2. VEGETATION ENCOUNTERED

The site visit confirmed that the study area had been transformed as a result of historical cultivation practices over a long period of time. No remaining natural veld of any significance remains anywhere within the study area (Photo 1 to Photo 8). Even though the veld had been lying fallow for the last couple of years the only indigenous plant species observed where a few hardy pioneer shrubs and bulb species, species often associated with disturbed renosterveld (Photo 3 & Photo 4).

It is common knowledge that Renosterveld, once cultivated, will not restore itself for many generations (if ever). In this case the indigenous vegetation had been transformed into a low weedy herbaceous landscape as a result of agriculture and associated activities. In addition, the only remaining natural veld in close proximity is small patch of veld to the south of the property (across the R315), protected as part of the Darling Local Nature Reserve. Even the small seasonal drainage line to the north of the property had been severely degraded (probably ploughed and planted during times past) over time and does not support any clear riparian vegetation (Photo 1).

Photo 1: A typical view of the vegetation encountered within the western portion of the study area (looking from the middle of the site to the north). The location of the small seasonal watercourse can just be seen in the depression to the north of the site (indicated by the arrows). The watercourse was most likely ploughed as part of the agricultural land in times past.

Photo 2: Another typical view of the vegetation encountered within the western section of the study area (looking from north to south from the midpoint of the site). Note the degraded status of the veld.

Photo 3: Patches of Chincherinchee (*Ornithogalum thyrsoides*) was commonly observed in some areas. This plant is extremely poisonous to livestock and is often one of a few hardy bulb species remaining in disturbed renosterveld.

The remaining vegetation throughout the study area, was reduced to a weedy herbaceous bottom layer dominated by weedy widespread species or disturbance indicator species such as *Trifolium repens* (white clover), weedy asteraceous species (e.g., *Cotula turbinate, Chrysocoma ciliata* etc.) and other weedy herbs such as *Indigofera* cf. digitata, *Echium vulgare, Limonium sinuatum*, *Rumex* cf. *acetosella* (Boksuring), *Silene gallica* and *Trachyandra flexifolia*. A few hardy bulb species were observed, such as *Ornithogalum thyrsoides* (sometimes forming patches as seen in Photo 3), *Albuca* cf. *flaccida, Oxalis* species *Pterygodium orobanchoides* and *Moraea flaccida* (tulp).

Photo 4: A patch larger shrubs encountered just above the existing Eskom Substation (southeastern corner of the western portion of the study area). These shrubs consisted mostly of disturbance indicator species and was often dominated by Kraalbos (*Galenia africana*).

Photo 5: The same watercourse slightly north of the previous picture. Again, the lack of natural riparian vegetation is evident of the disturbance within the site. In the background some Phragmites australis reeds can be seen growing within the stream.

On the edges of the study area, and scattered throughout the site, a number of hardy pioneer shrub species and disturbance indicator species were occasionally observed. They were usually dominated by *Galenia africana* (Kraalbos), but also included other hardy species such as *Aspalathus acuminata* (occasional large bushes observed), *Aspalathus hispida* (rarely observed), *Asparagus rubicundus*, *Eriocephalus africanus*, *Lycium ferocissimum,* the climber *Cissampelos capensis* and *Searsia laevigata.*

Photo 6: Typical vegetation encountered within the eastern portion of the study area (looking from north to south, from the middle of the site).

Photo 7: An old excavated area, filled with rainwater after the recent heavy rains, observed in the northwestern boundary of the eastern portion of the site.

Photo 8: Another view of the eastern portion of the study area (looking from north to south, with the railway showing to the left of picture). Note the large *Eucalyptus* trees, that was often observed on the borders of the study area.

4.3. FLORA ENCOUNTERED

Table 7 gives a list of the plant species encountered in the study area. It is important to note that the species list is based on a one-day site visit, and the focus was on the evaluation of the vegetation status more than a full botanical assessment. However, the author took care to look for potential significant species (e.g., protected- and rare or endangered species) that might be located within this vegetation type. No red-listed plants or any other protected plant species were observed.

Table 7: List of plant species observed within the proposed development footprint.

NO.	SPECIES NAME	FAMILY	STATUS	LOCATION
1.	*Albuca* cf. *flaccida*	HYACINTHACEAE	LC	Medium /small bulb - occasionally observed.
2.	*Aspalathus acuminata*	FABACEAE	LC	Medium/Large thorny shrub - occasionally observed.
3.	*Aspalathus hispida*	FABACEAE	LC	Small shrub – rarely observed.
4.	Asparagus rubicundus	ASPARAGACEAE	LC	Hardy woody climber.
5.	*Chrysocoma ciliata*	ASTERACEAE	LC	Herbaceous shrub – occasionally observed
6.	*Cissampelos capensis*	MENISPERMACEAE	LC	A climber occasionally observed within *Lycium* shrubs.

NO.	SPECIES NAME	FAMILY	STATUS	LOCATION
7.	*Cotula turbinate*	ASTERACEAE	LC	Gansogies – common weedy herb in the bottom layer.
8.	*Echium vulgare*	BORAGINACEAE	Naturalised weed	Occasionally observed.
9.	*Eriocephalus africanus*	ASTERACEAE	LC	A few individuals observed (mostly to the south outside of the footprint area).
10.	*Galenia africana*	AIZOACEAE	LC	A weedy herb, often used as a disturbance indicator species.
11.	*Limonium sinuatum*	PLUMBAGINACEAE	Naturalised week	Sea lavender – common within the herbaceous bottom layer.
12.	*Lycium ferocissimum*	SOLANACEAE	LC	Hardy shrub occasionally observed.
13.	*Moraea flaccida*	IRIDACEAE	LC	Occasional patches observed.
14.	*Ornithogalum thyrsoides*	HYACINTHACEAE	LC	Common throughout -often forming patches.
15.	*Oxalis* cf. *purpurea*	OXALIDACEAE	LC	Occasionally observed
16.	*Oxalis pes-caprae*	OXALIDACEAE	LC	Cape sorrel - occasionally observed.
17.	*Pterygodium orobanchoides*	ORCHIDACEAE	LC	Occasionally observed within the herbaceous bottom layer.
18.	*Rumex* cf. *acetosella*	POLYGONACEAE	Naturalised week	Boksuring:
19.	*Searsia laevigata*	ANACARDACEAE	LC	A medium to large shrub, occasionally observed.
20.	*Silene gallica*	CARYOPHYLLACEAE	Naturalised weed	Occasionally observed within the herbaceous bottom layer.
21.	*Trachyandra flexifolia*	ASPHODELACEAE	LC	Patches observed in the open, veld to the northeast.
22.	*Trifolium repens*		Naturalised weed	Dominating the herbaceous bottom layer.

4.4. THREATENED AND PROTECTED PLANT SPECIES

South Africa has become the first country to fully assess the status of its entire flora. Major threats to the South African flora are identified in terms of the number of plant taxa Red-Listed as threatened with extinction as a result of threats like, habitat loss (e.g. infrastructure development, urban expansion, crop cultivation and mines), invasive alien plant infestation (e.g. outcompeting indigenous plant species), habitat degradation (e.g. overgrazing, inappropriate fire management etc.), unsustainable harvesting, demographic factors, pollution, loss of pollinators or dispersers, climate change and natural disasters (e.g. such as droughts and floods). South Africa uses the internationally endorsed IUCN Red List Categories and Criteria in the Red List of South African plants. However, due to its strong focus on determining risk of extinction, the IUCN system does not highlight species that are at low risk of extinction but may nonetheless be of high conservation importance. As a result, a SANBI uses an amended system of categories to highlight species that may be of low risk of extinction but are still of conservation concern (SANBI, 2015).

Red list of South African plant species: The Red List of South African Plants online provides up to date information on the national conservation status of South Africa's indigenous plants (SANBI, 2020).

- No red-listed species was observed during the study.

NEM:BA protected plant species: The National Environmental Management: Biodiversity Act, Act 10 of 2004, provides for the protection of species through the "Lists of endangered, endangered, vulnerable and protected species" (GN. R. 152 of 23 February 2007).

- No species protected in terms of NEM: BA was observed.

NFA Protected plant species: The National Forests Act (NFA) of 1998 (Act 84 of 1998) provides for the protection of forests as well as specific tree species (as updated).

- No species protected in terms of the NFA was observed.

4.5. PLANT SPECIES SENSITIVITY THEME

According to the NEMA EIA screening tool report for this project (Refer to Appendix 1) compiled by EnviroAfrica on the 3rd of March 2023, the relative plant species sensitivity is considered as of High Sensitivity, because the original vegetation type is classified as endangered and specifically because of the potential that quite an extensive number of sensitive plants might occur in this area (or is known to have a distribution within the broader area or this vegetation type).

A list of these plants is given within the screening report from Page 17 to 19 (Appendix 1). The list includes 20 Sensitive species (not named in the screening report). The names of these species were requested through a Eiadatarequest (email eiadatarequests@sanbi.org.za). The list includes several plants from the following plant taxa: *Babiana*, *Gladiolus*, *Moraea*, *Pelargonium*, *Eriospermum*, *Disa Othonna* and *Lachenalia*.

Unfortunately, Erf 511 had been under cultivation (dry-land commercial annual crops) over a long period of time. It is common knowledge that Renosterveld, once cultivated, will not restore itself for many generations (if ever). In this case the indigenous vegetation had been transformed into a low weedy herbaceous landscape as a result of agriculture and associated activities. Only a few hardy or indigenous pioneer species had managed to survive the continual impact of agriculture, altered fire regimes. None of the species listed in the screening report were observed.

Because of the degraded state of the study area, it is considered unlikely that the proposed solar facility will result in any significant additional impact on the plant species sensitivity theme. Also because of the degraded status of the site the Plant Species theme for this study area should be rated as **low sensitive**.

5. FAUNA AND AVI-FAUNA

No fauna or avi-fauna screening was done as part of this study, but observations were made during the site visit. The property has been under intensively cultivation (dry-land commercial crops & livestock grazing) over a long period of time and also falls within an area with a long history of intensive cultivation. Even the watercourse to the north of the study area had been degraded (and was probably ploughed as part of the agricultural fields in the past).

5.1. ANIMAL SPECIES THEME SENSITIVITY

Historically it is expected that large mammals such as Mountain Zebra, Quagga, Bluebuck, Red Hartebeest, Eland, Bontebok, Elephant, Black Rhino, Buffalo, Lion, Cheetah, Wild Dog, Spotted Hyena and Leopard were common in the Western Cape (although probably not in large numbers). Of these large mammals, only the Mountain Zebra and Leopard survived (by fleeing to the mountains), with the Bontebok just surviving near Bredasdorp. All the other species became extinct in the Fynbos Biome, although many have been re-introduced into conservation areas from outside the region. The Quagga and Bluebuck are now extinct (www.inaturalist.org/posts/13033-renosterveld).

Smaller mammals common to the Western Cape are chacma baboons, klipspringers, grysbok, dassies, mongooses, cape dune mule-rat and the striped mouse. Fynbos also does not support high numbers of birds, but all six bird species endemic to the south-west Cape are fynbos species, e.g. the Cape sugarbird and orange breasted sunbird. These two birds are found only in fynbos and play an important role in pollinating flowers, including those of heaths (erica's) and proteas. Another very common sunbird frequenting the fynbos biome, is the lesser double collared sunbird. On the other hand, Fynbos supports large numbers of butterfly species, many of which, are now at risk, especially the myrmecophilous (ant associated) butterflies from the family Lycaenidae. The early stages (larvae) of many of these butterfly species are entirely carnivorous and live on a diet of ant brood. The butterfly larvae live inside the nest of their host ant. Myrmecophilous butterflies require the presence of both host ant and host plant as well as optimal climatic conditions. The disturbance of their preferred habitat (often small areas) could lead to the extinction of a rare species confined to a single location. Although fynbos is not particularly rich in reptiles and amphibians, many of the species living there are both endemic and threatened. The very rare geometric tortoise is found in only a few surviving fynbos areas and is regarded as the world's second rarest tortoise. The Cape has more than half of South Africa's frog species. Furthermore, of the 62 different frogs occurring here, 29 are endemic being found nowhere else on earth. The Table Mountain ghost frog lives only in the mountain's fast-flowing rocky streams. The tiny micro frog and Cape platanna are restricted to a few surviving vleis in the south-west Cape (https://whalecoast.info/attraction/animals-living-in-fynbos/).

According to the **NEMA EIA Sensitivity** scan for the site (Appendix 1) the Animal Species Theme Sensitivity is **High Sensitive** because of the potential presence of the species listed in the Table below (Table 8).

Table 8: Animal species theme according to the NEMA EIA Sensitivity Scan results.

FEATURES	MOTIVATION
Aves – **High** *Circus maurus* (Black Harrier)	The Black harrier is an **endangered** bird and one of southern Africa's rarest endemic raptors. It favors Renosterveld, short Fynbos and Karoo habitat, where it breeds in shallow nests on the ground. These birds are mostly associated with larger, well-connected, and more pristine patches of veld and is often considered an indicator of well-preserved natural veld (Curtis-Scott *et. al.*, 2020). The proposed project will impact on a small portion of degraded veld (transformed) that had been subject to constant disturbance over a long period of time. The natural vegetation had been transformed and the renosterveld replaced by a low growing herbaceous ground cover (dominated by exotic weeds and disturbance indicator species). The disturbed veld and the proximity to constant anthropogenic activities

FEATURES	MOTIVATION
	will not be favored as nesting sites as it will not provide protection and camouflage for its young. The black harrier might hunt over this area (although even this is unlikely, since most of the area is characterized by intensive cultivation), but it is unlikely to roost or breed in this area. As a result, it is considered highly unlikely that the proposed development will result in any significant additional impact on the breeding or feeding patterns of these birds. With regards to the is project the sensitivity rating is considered **low sensitive**.
Aves – **High** *Falco biarmicus* (Lanner Falcon)	Lanner Falcon numbers appears to be decreasing and has been classified as **vulnerable**. The falcon is widespread across Africa, the Arabian Peninsula and the Western Palearctic (Ferguson-Lees and Christie 2001). It occurs widely but sparsely throughout South Africa, Lesotho and Swaziland, with the highest densities recorded in Western Cape and KwaZulu-Natal. The species is a partial seasonal migrant, and there is a post-breeding exodus from the core breeding range in the eastern sour grasslands (December-January), with apparent movements westwards in the non-breeding season into Fynbos, Nama Karoo and southern Kalahari, returning May-June (Van Zyl et al. 1994). Movements may be more variable and nomadic in character and are probably related to rainfall and consequently prey abundance. In the Overberg their presence are linked to agricultural cultivation and resultant high density of rodents, peaking during cereal and crop harvests periods. There is even evidence that this species may benefit from agricultural development. Habitat: the bird is generally a cliff-nester, and its breeding distribution is closely associated with these cliffs, but they are able to breed on lower rock-faces and disused nests of other birds (e.g., in the Karoo it may take advantage of existing corvid nests on transmission poles, enabling it to inhabit large expanses of otherwise treeless habitat) (Barnes & Jenkins 2000). It generally favours open grassland, cleared or open woodland and agricultural land and hunts mainly birds, especially doves, pigeons and chickens (Birdlife International, 2023). It is thus not unlikely that the Lanner Falcon may hunt over the study area (and surroundings). There is even a number of huge *Eucalyptus* trees next to the proposed development, which can be used for roosting or nesting. However, the proposed development will impact mainly on existing agricultural, which may result in a small impact on its hunting area but is unlikely to impact on roosting or nesting areas. As a result, with regards to this project the sensitivity rating is considered **Low Sensitive**.
Aves – **High** *Afrotis afra* (Black Korhaan)	The southern black korhaan is suspected of undergoing rapid population decline owning to habitat fragmentation and has been listed as **vulnerable**. This bird is endemic to southwestern South Africa. It prefers semi-arid habitats such as grasslands, shrublands and savannas, where it feeds mainly on insects, such as termites, grasshoppers, and beetles, but it also small reptiles and plant products such as seeds, foraging on the ground and picking up food items with its bill. In the Western Cape it is uncommon to common in the remnants of renosterveld and Strandveld. Southern Black Korhaan is adversely affected by the loss of, especially, its fynbos habitat to crop agriculture (Evans, 2023). The Korhaan is mainly restricted to natural veld. Since the study area has been under cultivation over a long period of time, it is considered highly unlikely that the proposed development will have any significant additional impact on the breeding or feeding habits of this bird. With regards to the is project the sensitivity rating should be **Low Sensitive**.
Insecta – **Medium** *Stygionympha dicksoni* (Dickson's hillside brown butterfly)	The Dickson's Brown is a butterfly of the family Nymphalidae. It is an endemic range-restricted taxon from the Western Cape Province but had not been observed for 32 years in areas close to Cape Town. It is considered **critically endangered** (possibly extinct) as a result of habitat destruction and degradation. For example, the type

FEATURES	MOTIVATION
	locality on the Tygerberg Hills, is now a large quarry site (Ball, 2018). Although potentially extinct, continued search for further subpopulations is still required before it is formally listed as extinct (last observed in 1985). Its habitat is described as renosterveld type fynbos on western and southern slopes of the low hills south of Darling and near Malmesbury (it used to occur in the Tygerberg Hills, near Cape Town in the south). The Renosterveld in which this taxon occurred is itself one of the most endangered Vegetation Types (Cowling and Richardson, 1995). The vegetation within the study area had been transformed over time as a result of agriculture and the renosterveld had been replaced by a low growing herbaceous ground cover (dominated by exotic weeds and disturbance indicator species). The study area does not overlap any hilly areas (and can be described as located on rolling planes). It is considered highly unlikely that the proposed development will have any significant additional impact on habitat for this species. With regards to the is project the sensitivity rating is considered **Low Sensitive**.
Insecta – **Medium** *Trimenia wallengrenii wallengrenii* (Wallengren's copper)	Wallengren's copper or Wallengren's silver-spotted copper, is a species of butterfly in the family Lycaenidae, endemic to South Africa. Is also considered **critically endangered** and has not been observed since 2003 at its last-known location (despite regular surveys). The last two subpopulations were on privately owned farms. Monitoring of this taxon has not revealed any specimens in 14 years. This taxon is thus presumed to be extinct (Ball(c), 2018). It was once widespread on hills between Darling in the west to Mamre in the east (and historically near Stellenbosch). The reason for its decline is considered to be the effects of habitat fragmentation due to farming, degradation, invasive alien vegetation and changed fire regimes. This butterfly used to be found near the summits and on the western slopes of low hills in renosterveld vegetation at an altitude of 350 m to 450 m (Ball, 2018). The vegetation within the study area had been transformed over time as a result of agriculture and the renosterveld had been replaced by a low growing herbaceous ground cover (dominated by exotic weeds and disturbance indicator species). The study area does not overlap any hilly areas (and can be described as located on rolling planes). It is considered highly unlikely that the proposed development will have any significant additional impact on habitat for this species. With regards to the is project the sensitivity rating is considered **Low Sensitive**.
Invertebrate – Medium *Pachysoma aesculapius* (Scarab dung beetle)	This beetle is part of the scarab beetle family and is listed as **vulnerable** by IUCN (Davis, 2013). However, as most of the historical distribution range of this species is within modified or developing coastline. Since it is unsure if this species is present in the in the West Coast National Park it must be regarded as the most threatened South African Pachysoma species (Harrison et.al., 2003). According to Harrison et. al., 2003, this beetle, historically, could be found from Cape Town to the mouth of the Olifants River (which might be the barrier to the northwards extension of its distribution. The southern populations (Somerset West, Cape Flats, Salt River) material only dated from between 1882 to 1886 and are possibly now extinct (the most recent collection in the south is from the Modder River in 1987, which runs to the north of Grotto Bay). The West Coast National Park is the closest conservation area for this species, with a single record from the 1960's (which remains unconfirmed). This species of beetle appears to prefer firm sands on coastal hummocks, riverbanks and vegetated dunes (Harrison *et. al.,* 2003). According to the IUCN red list database's geographical range, the study area might fall within the potential historical distribution range for this species. The most recent southern observation of this species was made at the Modder River, which is far to

FEATURES	MOTIVATION
	the northwest and nearer to the coast. The study area is not near the coastal domain and the site itself is significantly degraded/transformed. According to Davis (2013) it is presumed locally extinct in the southernmost part of its known range. As a result, is considered highly unlikely that the proposed project will have any significant additional impact on the survival or distribution of this species. With regards to this project the sensitivity rating is considered to be **Low sensitive**.
Invertebrate – Medium *Bullacris obliqua* (Bladder grasshopper)	The bladder grasshopper is is endemic to the west coast of South Africa, occurring both in the Western Cape and Northern Cape Provinces, where it inhabits the Fynbos biome. It is listed as **vulnerable**, because of habitat destruction due to extensive urban development and agricultural across its geographic range. *Bullacris obliqua* emerges seasonally and has been observed from August to November. The species is not commonly encountered in the field, despite fairly extensive surveys within its geographical range. It also appears to be absent from some areas where it was historically recorded to occur. It has a discontinuous distribution with very small subpopulations, and there is unlikely to be much gene flow between geographically separated subpopulations as females are flightless. Therefore, the population is considered severely fragmented. *Eriocephalus africanus* is currently the only confirmed host plant for this species (Couldridge & Bazelet, 2018). This species tends to inhabit indigenous veld within the Fynbos Biome along the West Coast of South Africa with *Eriocephalus africanus* the only confirmed host plant. The study area itself is basically transformed in terms of remaining natural veld, but several *Eriocephalus africanus* plants were observed, scattered throughout the site. However, the long-term impact of agriculture within the study area and its immediate surroundings would most likely have led to the demise of this species within the study area (if it ever occurred within the site). In its current state it is considered highly unlikely that the proposed development will have any significant additional impact on the habitat or distribution of this species. With regards to the is project the sensitivity rating is considered **Low Sensitive**.

6. TERRESTRIAL BIODIVERSITY THEME SENSITIVITY

The proposed project entails the establishment of a Solar PV facility (approximately 54 ha in size) within an area that used to be covered by Swartland Granite Renosterveld (Figure 7), which is considered an **endangered** vegetation type. Desktop studies together with the site visit confirm that the whole of the western portion of Erf 551 had been subject to agriculture (dry-land commercial annual crops) over a long period of time. The vegetation within the study area can now be described as transformed in terms of botanical sensitivity (renosterveld does not restore easily, once cultivated).

A small degraded seasonal watercourse or drainage line, runs to the north of the property, but should not be impacted directly by the proposed solar facility. However, the study area might impact on ecological support areas (ESA 2) and critical biodiversity areas (CBA 1) associated with this small seasonal watercourse (Figure 3).

6.1. HABITAT CONDITIONS AND DIVERSITY

The study area falls within an area characterized by intensive cultivation over a long period of time.

Historic Google Images shows that the site was already cultivated (ploughed) during 2003 and that it was intensively farmed (commercial annual crops) until recently. At present it is used for livestock grazing (lying fallow). As a result, the site itself have been degraded to the point of being transformed in terms of botanical significance. At the time of the site visit the site the site was grazed by horses. No special habitats (e.g., true quartz, granite outcrops or "heuweltjies") were observed in the study area or its immediate surroundings.

6.2. LAND-USE

The property is Municipal land, zoned "Split Zoning: Commonage land" and has been used for agriculture (commercial annual crops & grazing) over a long period of time. At present it is used for grazing (lying fallow).

6.3. VEGETATION ENCOUNTERED

Swartland Granite Renosterveld is described as a mosaic of grasslands/herblands and medium dense, microphyllous shrublands dominated by renosterbos (with groups of small trees and tall shrubs associated with heuweltjies and rock outcrops). The site visit confirmed that the study area had been transformed as a result of cultivation over a long period of time. The indigenous vegetation had been transformed and reduced to a low herbaceous cover dominated by widespread weedy plants in combination with hardy pioneer species or (often disturbance indicator species). On the edges of the old fields, and occasionally within the study, a few hardy pioneer shrub were sometimes observed (all of them hardy species and often disturbance indicator species such as *Galenia africana*). The study area does not contain any intact natural vegetation of any significance and had been cultivated over a long period of time (Photo 1 to Photo 8).

It is important to consider that renosterveld, once cultivated, is unlikely to restore itself (for many generations, if ever), even with active rehabilitation. In this case, rehabilitation and conservation of the site is not considered a viable option as there would be many other areas in better condition more worthy of conservation efforts.

6.4. THREATENED AND PROTECTED PLANT SPECIES

No red-data or any protected plant species were observed within the proposed footprint (refer to Heading 4.4).

- According to the NEMA EIA screening tool report for this project (Refer to Appendix 1), the relative plant species sensitivity is considered "**High Sensitivity"**, because the original vegetation type is classified as endangered and specifically because of the potential that a number of sensitive plants is known to have a distribution range within the broader area or this vegetation type.

Unfortunately, Erf 511 had been under cultivation (dry-land commercial annual crops) over a long period of time and renosterveld, once cultivated, will not restore itself for many generations (if ever). Only a few hardy or indigenous pioneer species had managed to survive the continual impact of

agriculture, grazing, and altered fire regimes. None of the species listed in the screening report were observed. Because of the degraded state of the study area, it is considered unlikely that the proposed solar facility will result in any significant additional impact on sensitivity plants.

As a result, the Plant Species theme for this study area is rated as **Low Sensitive**.

6.5. FAUNA AND AVI-FAUNA

Historically several large and small mammals would have been expected to occur within the Fynbos / Renosterveld vegetation of the Swartland area (although not in large numbers). Fynbos does not support a high number of birds , but all six bird species endemics to the south-west Cape are fynbos species. On the other hand, Fynbos supports large numbers of butterfly species, many of which, are now at risk, especially the myrmecophilous (ant associated) butterflies from the family Lycaenidae, because of ongoing disturbances to their preferred habitat (often small areas). Although fynbos is not particularly rich in reptiles and amphibians, many of the species living there are both endemic and threatened. The very rare geometric tortoise is found in only a few surviving fynbos areas and is regarded as the world's second rarest tortoise. The Cape has more than half of South Africa's frog species. Furthermore, of the 62 different frogs occurring here, 29 are endemic being found nowhere else on earth.

According to the **NEMA EIA Sensitivity** scan for the site (Appendix 1) the Animal Species Theme Sensitivity is **High Sensitive** because of the potential presence of several bird species (mostly vulnerable or endangered birds-of-prey), two butterfly species, one beetle and one grasshopper species listed in Table 8. Unfortunately, because of the long history of agriculture and the transformed nature of the veld (and other reasons listed in Table 8) it is considered highly unlikely that the proposed development will result in any significant additional impact on any of these species. Realistically, only the Lanner Falcon might still hunt over this area, and the bladder grasshopper might still be found in the small reserve to the south of the property (it is unlikely to have survived the ongoing cultivation periods – even though its hostplant was still encountered within the study area).

As a result, the animal species theme sensitivity for this project is considered to be **Low Sensitive**.

6.6. CONSERVATION PRIORITY AREAS (CBA'S & ESA'S)

According to the 2017, Western Cape Biodiversity Spatial Plan (WCBSP) the study area might impact on ecological support areas (ESA 2) and critical biodiversity areas (CBA 1) associated with the small seasonal watercourse running to the north of the study area through Erf 511 (CapeNature, 2017) (Figure 3)**.**

However, the footprint for the proposed development area has been chosen to avoid this watercourse and the watercourse itself had been degraded (and was probably ploughed as part of the agricultural fields in the past).

6.7. TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT

The following table rates the significance of environmental impacts associated with the proposed development (using the methods described under Heading 3.4). It also evaluates the expected accumulative effect of the proposed development as well as the No-Go option.

Table 9: Impact assessment associated with the proposed activity.

Impact assessment								
Aspect	**Mitigation**	**CV**	**Lik**	**Dur**	**Ext**	**Sev**	**Significance**	Short discussion
Special habitats: Potential impact on special habitats (e.g. true quartz or "heuweltjies")	Without mitigation	1	1	3	1	1	6	The proposed solar facility will impact on historical agricultural land. The original vegetation type is considered endangered.
	With mitigation	1	1	3	1	1	6	Ensure that the solar facility does not have any additional impact on the watercourse (to the north of the site).
Watercourses & Wetlands: Potential impact on natural water resources and it's ecological support areas.	Without mitigation						0	The proposed footprint area was chosen to avoid the watercourse within Erf 551.
	With mitigation						0	Ensure that the solar facility does not have any additional impact on the watercourse (to the north of the site).
Vegetation status: Loss of vulnerable or endangered vegetation and associated habitat.	Without mitigation	1	2	3	1	1	7	The proposed solar facility will impact on historical agricultural land. The original vegetation type is considered endangered.
	With mitigation	1	2	3	1	1	7	Ensure that the solar facility does not have any additional impact on the watercourse (to the north of the site).
Conservation priority: Potential impact on protected areas, CBA's, ESA's or Centre's of Endemism.	Without mitigation	3	2	3	1	2	24	The proposed mining activities may impact on identified CBA1 & ESA associated with the small watercourse to the north.
	With mitigation	3	1	3	1	1	18	Ensure that the solar facility does not have any additional impact on the watercourse (to the north of the site).
Connectivity: Potential loss of ecological migration corridors.	Without mitigation	1	1	3	1	1	6	The study area is located within an intensively cultivated landscape and had been transformed as a result of past agricultural practices.
	With mitigation	1	1	3	1	1	6	Ensure that the solar facility does not have any additional impact on the watercourse (to the north of the site).
Protected & endangered plant species: Potential impact on threatened or protected plant species.	Without mitigation	1	2	3	1	1	7	No red-data-, protected plants or sensitive species listed in the DFFE screening report were observed within the study area.
	With mitigation	1	2	3	1	1	7	Ensure that the solar facility does not have any additional impact on the watercourse (to the north of the site).
Fauna: Potential impact on mammals, reptiles & amphibians.	Without mitigation	2	2	3	1	2	16	The DFFE screening report lists sensitive Insecta & invertebrate species that might be impacted. The potential impact is rated as Low Sensitive. Refer to Table 8.
	With mitigation	2	2	3	1	1	14	The sensitivity assessment (Table 8) suggests that it is highly unlikely that any of these species will be encountered or frequent the study area.

Impact assessment								
Aspect	**Mitigation**	**CV**	**Lik**	**Dur**	**Ext**	**Sev**	**Significance**	Short discussion
Avi-fauna: Potential impact on threatened or protected bird species.	Without mitigation	3	2	3	1	2	24	The DFFE screening report lists sensitive bird species that might be impacted. The potential impact is rated as Low Sensitive. Refer to Table 8.
	With mitigation	3	1	3	1	1	18	The sensitivity assessment suggests that it is highly unlikely that this species will be encountered or frequent the study area.
Cumulative impacts: Cumulative impact associated with proposed activity.	Without mitigation	3	2	3	1	2	24	Potential impact on historical agricultural land, vulnerable fauna and avi-fauna, a small watercourse and a CBA & ESA.
	With mitigation	3	2	3	1	1	21	Ensure that the solar facility does not have any additional impact on the watercourse (to the north of the site).
The "No-Go" option: Potential impact associated with the No-Go alternative.	Without mitigation	1	2	3	1	1	7	Erf 511 is municipal commonage used for agriculture. These agricultural activities is likely to be ongoing, which mean that agricultural impacts will continue. Renosterveld is unlikely to restored itself, even with active rehabilitation.
	With mitigation							

According to the **NEMA EIA Sensitivity** scan for the site (Appendix 1) the Terrestrial Biodiversity Theme Sensitivity is **VERY HIGH SENSITIVE** because of the potential impact on ecological support areas (ESA's), critical biodiversity areas (CBA's), endangered Swartland Granite Renosterveld vegetation type and sensitive fauna & flora species.

The Terrestrial biodiversity assessment (Table 9) aims to take all the discussion in this report into account, including the existing status of the study area. According, Table 9 the main impacts associated with the proposed development will be:

- A potential impact on a small non-perennial watercourse and its associated ESA and CBA corridors;
- A potential low impact on bird species (specifically the Lanner Falcon).

However, based on the Terrestrial Biodiversity Evaluation for this study (Table 9), the potential accumulative impact is considered to a **LOW negative** (even without mitigation).

With mitigation it is considered highly unlikely that the development will contribute significantly to any of the following:

- Significant loss of vegetation type and associated habitat.
- Loss of ecological processes (e.g., migration patterns, pollinators, river function etc.) due to construction and operational activities.
- Loss of local biodiversity and threatened plant species.
- Loss of ecosystem connectivity.

As a result, the Terrestrial Biodiversity Theme Sensitivity for the proposed project is considered **LOW SENSITIVE**.

6.8. CONCLUSIONS

The status of the vegetation within the study area is considered transformed (old agricultural land) and reduced to a weedy herbaceous bottom layer dominated by weeds or widespread species or disturbance indicator species. On the edges of the study area, and scattered throughout the site, a number of hardy pioneer shrubs species were occasionally observed (usually dominated by disturbance indicator species such as *Galenia africana*).

The study area does not contain any intact natural vegetation of any significance and had been cultivated over a long period of time. Renosterveld is unlikely to restore itself (for many generations, if ever), even with active rehabilitation. Rehabilitation would only be possible if the study area is actively replanted and re-seeded with indigenous vegetation from surrounding intact veld and then protected as a conservation area. In this case, rehabilitation and conservation of the site is not considered a viable option as there would be many other areas in better condition more worthy of conservation efforts.

There are no specific sensitive areas within the study area. The Sensitivity map (Figure 8) focuses on the protection of the aquatic CBA identified in association with the small seasonal watercourse (Blue in Figure 8) to the north of the study area (but still within Erf 551). It also shows the location of the Darling Veldblomme Local Nature Reserve (Green in Figure 8).

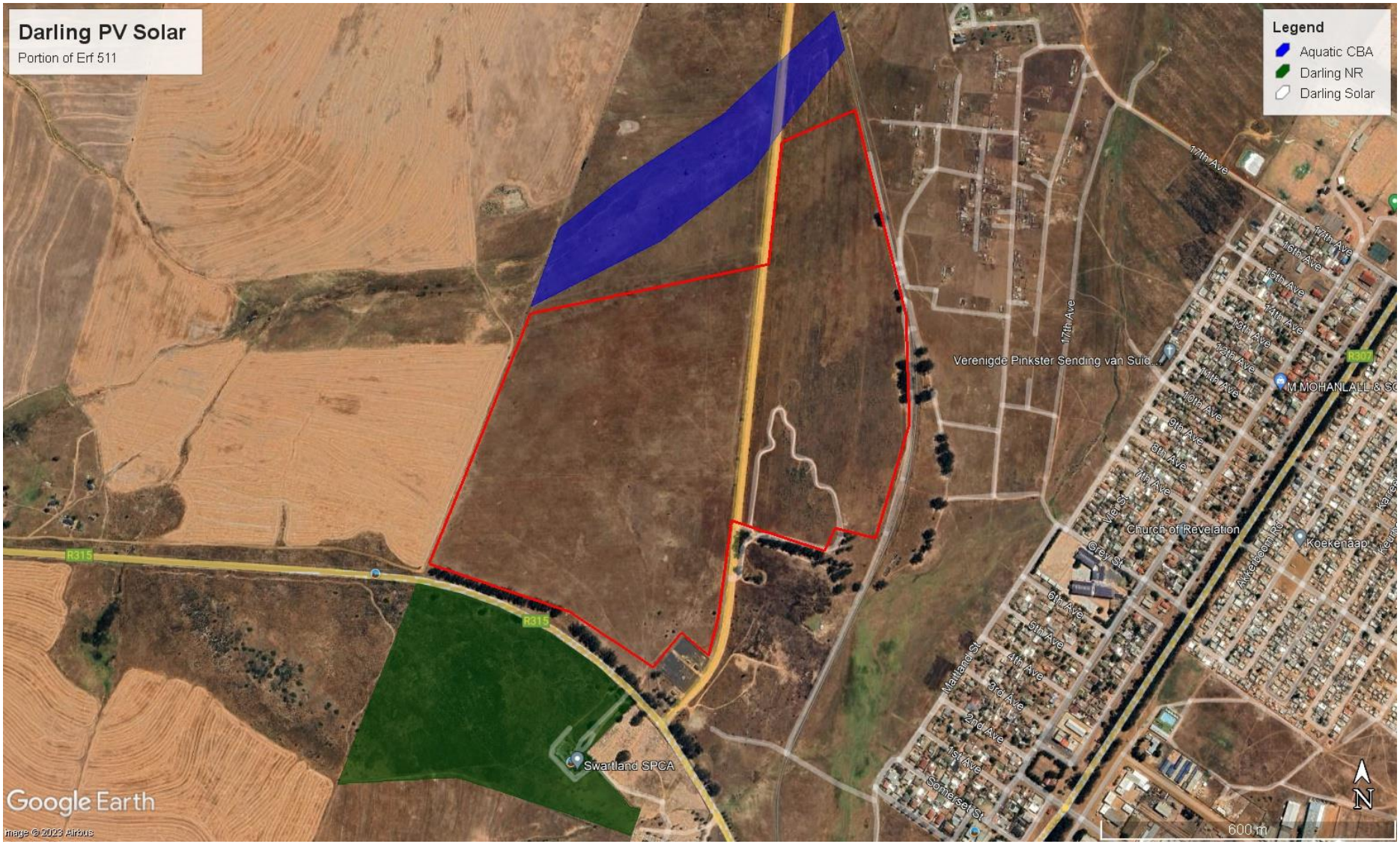

Figure 8: Sensitivity map: Google Earth Image showing the study area (red) the location of the proposed aquatic CBA (blue area) and the Darling Nature Reserve (Green)**.**

7. RECOMMENDATIONS

The study area is considered transformed with no intact or natural veld of any significance remaining. However, potential additional impacts on the watercourse to the north (even though degraded) should be minimised.

The following recommendations aims at the protection of seasonal watercourse (refer to Figure 8).

- The aquatic CBA area shown in the sensitivity map Figure 8, must be considered a no-go area (to be protected).
- Indiscriminate clearing of any area outside of the footprint must be avoided.

8. REFERENCES

Acocks, J.P.H. 1953. Veld types of South Africa. *Mem. Bot. Surv. .S. Afr*. No. 28: 1-192.

Anon, 2008. Guideline regarding the determination of bioregions and the preparation and publication of Bioregional Plans. April 2008. Government Notice No. 291 of 16 March 2009.

Ball, J. 2018. *Stygionympha dicksoni*. In: Mecenero, S., Ball, J.B., Edge, D.A., Hamer, M.L., Henning, G.A., Kruger, M., Pringle, E.L., Terblanche, R.F. & Williams, M.C. (eds). 2013. Conservation assessment of butterflies of South Africa, Lesothos and Swaziland: Red List and atlas. Saftronics (Pty) Ltd., Johannesburg & Animal Demography Unit, Cape Town.

Ball, J. 2018b. *Stygionympha dicksoni*. Southern African Lepidoptera Conservation Assessment (SALCA). Red List of South African Species. South African Biodiversity Institute. http://speciesstatus.sanbi.org/assessment/last-assessment/255/. Downloaded on 19/10/2023.

Ball, J. 2018c. *Trimenia wallengrenii wallengrenii*. Southern African Lepidoptera Conservation Assessment (SALCA). Red List of South African Species. South African Biodiversity Institute. http://speciesstatus.sanbi.org/assessment/last-assessment/416/. Downloaded on 19/10/2023.

Barnes, K.N. & Jenkins, A.R. 2000. in *Lanner Falcon Falco biarmicus*, Edited by Barnes, K N, BirdLife South Africa: 141. (bib)

Bazelet, C.S. & Naskrecki, J. 2013. *Conocephalus peringueyi***.** Red List of South African Species. South African Biodiversity Institute. http://speciesstatus.sanbi.org/assessment/last-assessment/4223/. Downloaded on 8/05/2023.

BirdLife International, (2023). Species factsheet: *Circus maurus*. Downloaded from http://www.birdlife.org on 28/07/2023.

City of Cape Town. 2018. City of Cape Town Biodiversity Report 2018.

City of Cape Town. 2022. City of Cape Town: State of the environment report. 2022. https://www.capetown.gov.za/document-centre

Couldridge, V. & Bazelet, C. 2018. *Bullacris obliqua*. Red List of South African Species. South African Biodiversity Institute. http://speciesstatus.sanbi.org/assessment/last-assessment/4376/. Downloaded on 19/10/2023.

Cowling, R. & Richardson, D. 1995. Fynbos: South Africa's Unique Floral Kingdom. Fernwood Press, Cape Town.

Curtis-Scott, O., Goulding, M., Helme, N., McMaster, R., Privett, S. & Stirton, C. 2020. Field Guide to Renosterveld of the Overberg. Penguin Random House, South Africa (Pty) Ltd.

Davis, A.L.V. 2013. *Pachysoma aesculapius*. *The IUCN Red List of Threatened Species* 2013: e.T137321A523186. https://dx.doi.org/10.2305/IUCN.UK.2013-2.RLTS.T137321A523186.en. Accessed on 28 July 2023.

De Villiers C.C., Driver, A., Brownlie, S., Clark, B., Day, E.G., Euston-Brown, D.I.W., Helme, N.A., Holmes, P.M., Job, N. & Rebelo, A.B. 2005. Fynbos Forum Ecosystem Guidelines for Environmental Assessment in the Western Cape. Fynbos Forum, c/o Botanical Society of South Africa: Conservation Unit, Kirstenbosch, Cape Town.

Driver A., Sink, K.J., Nel, J.N., Holness, S., Van Niekerk, L., Daniels, F., Jonas, Z., Majiedt, P.A., Harris, L. & Maze, K. 2012. National Biodiversity Assessment 2011: An assessment of South Africa's biodiversity and ecosystems. Synthesis Report. South African National Biodiversity Institute and Department of Environmental Affairs, Pretoria

Driver, A., Maze, K., Rouget, M., Lombard, A.T., Nel, J.L., Turpie, J.K., Cowling, R.M., Desmet, P., Goodman, P., Harris, J., Jonas, Z., Reyers, B., Sink, K. & Strauss, T. 2005. National spatial biodiversity assessment 2004: priorities for biodiversity conservation in South Africa. Strelitzia, 17. South African National Biodiversity Institute, Pretoria.

Evans, Steven. 2023. The effects of habitat loss and fragmentation on the relative abundance and

conservation of Southern Black Korhaan Afrotis afra, a South African endemic. Bird Conservation International. 33. 10.1017/S0959270923000230.

Ferguson-Lees, J. & Christie, D.A. 2001. Raptors of the World, Houghton Mifflin Company, 2001. (bib)

Harrison, J. Du G., Scholtz, C. H. & Chown, S. L., 2003. A revision of the endemic south-western African dung beetle subgenus Scarabaeus (Pachysoma) MacLeay, including notes on other flightless Scarabaeini (Scarabaeidae: Scarabaeinae), Journal of Natural History 37 (3), pp. 305-355.

Jacobs, K & Jangle, R. 2008. Renosterveld Ecosystem management plan: Western Cape. Unpublished, The Nature Conservation Corporation, Cape Town.

Krug, C.B. 2004. Practical guidelines for the restoration of renosterveld. University of Stellenbosch.

Low, A.B. & Rebelo, A.(T.)G. (eds.) 1996. *Vegetation of South Africa, Lesotho and Swaziland*. Department of Environmental Affairs and Tourism, Pretoria.

Mucina, L. & Rutherford, M.C. (eds.) 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

Pool-Stanvliet, R. 2017. Western Cape Biodiversity Spatial Plan Handbook. CapeNature Scientific Services Land Use Team, Jonkershoek, Stellenbosch.

Rebelo, A.G., Boucher, C., Helme, N., Mucina, L. & Rutherford, M.C. Fynbos Biome. In Mucina, L. & Rutherford, M.C. 2006. (eds.) The Vegetation of South Africa. Lesotho & Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria. pp. 53 – 219.

Skowno, A.L., Matlata, M., Slingsby, J.,Kirkwood,D., Raimondo, D.C., Von Staden, L., Holness, S.D., Lotter, M., Pence, G Daniels, F., Driver, A., Desmet, P.G., Dayaram, A. 2019. Terrestrial ecosystem threat status assessment 2018 – comparison with 2011 assessment for provincial agencies. National Biodiversity Assessment 2018 Technical Report. South African National Biodiversity Institute, Pretoria.

Skowno, A.L., Raimondo, D.C., Poole, C.J., Fizzotti, B. & Slingsby, J.A. (eds.). 2019a. South African National Biodiversity Assessment 2018 Technical Report Volume 1: Terrestrial Realm. South African National Biodiversity Institute, Pretoria. http://hdl.handle.net/20.500.12143/6370

South African National Biodiversity Institute. 2016. Botanical Database of Southern Africa (BODATSA) [dataset]. Doi: to be assigned

South African National Biodiversity Institute. 2018. Vegetation map of South Africa, Lesotho and Swaziland [vector geospatial dataset] 2018.

South African National Biodiversity Institute. 2020. Statistics: Red List of South African Plants version 2020.1. Downloaded from Redlist.sanbi.org on 2023/01/17

Van Wyk, A.E., & Smith, G.F. 2001. Regions of floristic endemism in South Africa. A review with emphasis on succulents. Umdaus press. Hatfield.

Van Zyl A. J., Jenkins A.R., Allan D.G. (1994). Evidence for seasonal movements by Rock Kestrels Falco tinnunculus and Lanner Falcons F. biarmicus in South Africa. *Ostrich*, 65(2): 111-121. (bib)

Walton, BA. 2006. Vegetation Patterns and Dynamics of Renosterveld at Agter-Groeneberg Conservancy, Western Cape, South Africa. Thesis presented in partial fulfilment of the requirements for the degree of Master of Science at the Stellenbosch University. April 2006.

Werger, M.J.A. 1974. On concepts and techniques applied in the Zürich-Montpellier method of vegetation survey. Bothalia 11, 3: 309-323.

APPENDIX 1: NEMA EIA SCREENING REPORT

APPENDIX 2: CURRICULUM VITAE – P.J.J. BOTES

Curriculum Vitae: Peet JJ Botes

Address: 22 Buitekant Street, Bredasdorp, 7280; **Cell**: 082 921 5949

Nationality:	South African
ID No.:	670329 5028 081
Language:	Afrikaans / English
Profession:	Environmental Consultant & Auditing
Specializations:	Botanical & Biodiversity Impact Assessments
	Environmental Compliance Audits
	Environmental Impact Assessment
	Environmental Management Systems
Qualifications:	**BSc** (Botany & Zoology), with Nature Conservation III & IV as extra subjects; Dept. of Natural Sciences, Stellenbosch University 1989.
	Hons. BSc (Plant Ecology), Stellenbosch University, 1989
	More than 20 years of experience in the Environmental Management Field (Since 1997 to present).
Professional affiliation:	Registered Professional Botanical, Environmental and Ecological Scientist at SACNASP (South African Council for Natural Scientific Professions) since 2005.
SACNAP Reg. No.:	400184/05

BRIEF RESUME OF RELEVANT EXPERIENCE

1997-2005: Employed by the Overberg Test Range (a Division of Denel), responsible for managing the environmental department of OTB, developing and implementing an ISO14001 environmental management system, ensuring environmental compliance, performing environmental risk assessments with regards to missile tests and planning the management of the 26 000 ha of natural veld, working closely with CapeNature (De Hoop Nature Reserve).

2005-2010: Joined Enviroscientific, as an independent environmental consultant specializing in wastewater management, botanical and biodiversity assessments, developing environmental management plans and strategies, environmental control work as well as doing environmental compliance audits and was also responsible for helping develop the biodiversity part of the Farming for the Future audit system implemented

by Woolworths. During his time with Enviroscientific he performed more than 400 biodiversity and environmental legal compliance audits.

2010-2017: Joined EnviroAfrica, as an independent Environmental Assessment Practitioner and Biodiversity Specialist, responsible for Environmental Impact Assessments, Biodiversity & Botanical specialist reports and Environmental Compliance Audits. During this time Mr Botes compiled more than 70 specialist Biodiversity & Botanical impact assessment reports ranging from agricultural-, infrastructure pipelines- and solar developments.

2017-Present: Establish a small independent consultancy (PB Consult) specialising in Environmental Audits, Biodiversity and Botanical specialist studies as well as Environmental Impact Assessment.

LIST OF MOST RELEVANT BOTANICAL & BIODIVERSITY STUDIES

Botes. P. 2007: Botanical assessment. Schaapkraal, Erf 644, Mitchell's Plain. A preliminary assessment of the vegetation in terms of the Fynbos Forum: Ecosystem guidelines. 13 November 2007.

Botes. P. 2008: Botanical assessment. Schaapkraal Erf 1129, Cape Town. A preliminary assessment of the vegetation using the Fynbos Forum Terms of Reference: Ecosystem guidelines for environmental Assessment in the Northern Cape. 20 July 2008.

Botes, P. 2010(a): Botanical assessment. Proposed subdivision of Erf 902, 34 Eskom Street, Napier. A Botanical scan and an assessment of the natural vegetation of the site to assess to what degree the site contributes towards conservation targets for the ecosystem. 15 September 2010.

Botes, P. 2010(b): Botanical assessment. Proposed Loeriesfontein low cost housing project. A preliminary Botanical Assessment of the natural veld with regards to the proposed low cost housing project in/adjacent to Loeriesfontein, taking into consideration the National Spatial Biodiversity Assessment of South Africa. 10 August 2010.

Botes, P. 2010(c): Botanical assessment: Proposed Sparrenberg dam, on Sparrenberg Farm, Ceres. . A Botanical scan and an assessment of the natural vegetation of the site. 15 September 2010.

Botes, P. 2011: Botanical scan. Proposed Cathbert development on the Farm Wolfe Kloof, Paarl (Revised). A botanical scan of Portion 2 of the Farm Wolfe Kloof No. 966 (Cathbert) with regards to the proposed Cathbert Development, taking into consideration the National Spatial Biodiversity Assessment of South Africa. 28 September 2011.

Botes, P. 2012(a): Proposed Danielskuil Keren Energy Holdings Solar Facility on Erf 753, Danielskuil. A Biodiversity Assessment (with botanical input) taking into consideration the findings of the National Spatial Biodiversity Assessment of South Africa. 17 March 2012.

Botes, P. 2012(b): Proposed Disselfontein Keren Energy Holdings Solar Facility on Farm Disselfontein no. 77, Hopetown. A Biodiversity Assessment (with botanical input) taking into consideration the findings of the National Spatial Biodiversity Assessment of South Africa. 28 March 2012.

Botes, P. 2012(c): Proposed Kakamas Keren Energy Holdings Solar Facility on Remainder of the Farm 666, Kakamas. A Biodiversity Assessment (with botanical input) taking into consideration the findings of the National Spatial Biodiversity Assessment of South Africa. 13 March 2012.

Botes, P. 2012(d): Proposed Keimoes Keren Energy Holdings Solar Facility at Keimoes. A Biodiversity Assessment (with botanical input) taking into consideration the findings of the National Spatial Biodiversity Assessment of South Africa. 9 March 2012.

Botes, P. 2012(e): Proposed Leeu-Gamka Keren Energy Holdings Solar Facility on Portion 40 of the Farm Kruidfontein no. 33, Prince Albert. A Biodiversity Assessment (with botanical input) taking into consideration the findings of the National Spatial Biodiversity Assessment of South Africa. 27 March 2012.

Botes, P. 2012(f): Proposed Mount Roper Keren Energy Holdings Solar Facility on Farm 321, Kuruman. A Biodiversity Assessment (with botanical input) taking into consideration the findings of the National Spatial Biodiversity Assessment of South Africa. 28 March 2012.

Botes, P. 2012(g): Proposed Whitebank Keren Energy Holdings Solar Facility on Farm no. 379, Kuruman. A Biodiversity Assessment (with botanical input) taking into consideration the findings of the National Spatial Biodiversity Assessment of South Africa. 27 March 2012.

Botes, P. 2012(h): Proposed Vanrhynsdorp Keren Energy Holdings Solar Facility on Farm Duinen Farm no. 258, Vanrhynsdorp. A Biodiversity Assessment (with botanical input) taking into consideration the findings of the National Spatial Biodiversity Assessment of South Africa. 13 April 2012.

Botes, P. 2012(i): Askham (Kameelduin) proposed low cost housing, Mier Municipality Residential Project, Northern Cape. A preliminary Biodiversity & Botanical scan in order to identify significant environmental features (and to identify the need for additional studies if required. 1 November 2012.

Botes, P. 2013(a): Groot Mier proposed low cost housing, Mier Municipality Residential Project, Northern Cape. A preliminary Biodiversity & Botanical scan in order to identify significant environmental features (and to identify the need for additional studies if required. January 2013.

Botes, P. 2013(b): Loubos proposed low cost housing, Mier Municipality Residential Project, Northern Cape. A preliminary Biodiversity & Botanical scan in order to identify significant environmental features (and to identify the need for additional studies if required. January 2013.

Botes, P. 2013(c): Noenieput proposed low cost housing, Mier Municipality Residential Project, Northern Cape. A preliminary Biodiversity & Botanical scan in order to identify significant environmental features (and to identify the need for additional studies if required. January 2013.

Botes, P. 2013(d): Rietfontein proposed low cost housing, Mier Municipality Residential Project, Northern Cape. A preliminary Biodiversity & Botanical scan in order to identify significant environmental features (and to identify the need for additional studies if required. January 2013.

Botes, P. 2013(e): Welkom proposed low cost housing, Mier Municipality Residential Project, Northern Cape. A preliminary Biodiversity & Botanical scan in order to identify significant environmental features (and to identify the need for additional studies if required. January 2013.

Botes, P. 2013(f): Zypherfontein Dam Biodiversity & Botanical Scan. Proposed construction of a new irrigation dam on Portions 1, 3, 5 & 6 of the Farm Zypherfontein No. 66, Vanrhynsdorp (Northern Cape) and a scan of the proposed associated agricultural enlargement. September 2013.

Botes, P. 2013(g): Onseepkans Canal: Repair and upgrade of the Onseepkans Water Supply and Flood Protection Infrastructure, Northern Cape. A Biodiversity & Botanical scan in order to identify significant environmental features (and to identify the need for additional studies if required). August 2013.

Botes, P. 2013(h): Biodiversity scoping assessment with regards to a Jetty Construction on Erf 327, Malagas (Matjiespoort). 24 October 2013.

Botes, P. 2013(i): Jacobsbaai pump station and rising main (Saldanha Bay Municipality). A Botanical Scan of the area that will be impacted by the proposed Jacobsbaai pump station and rising main. 30 October 2013.

Botes, P. 2014(a): Brandvlei Bulk Water Supply: Proposed construction of a 51 km new bulk water supply pipeline (replacing the existing pipeline) from Romanskolk Reservoir to the Brandvlei Reservoir, Brandvlei (Northern Cape Province). A preliminary Biodiversity & Botanical scan in order to identify significant environmental features (and to identify the need for additional studies if required). 24 February 2014.

Botes, P. & McDonald Dr. D. 2014: Loeriesfontein Bulk Water Supply: Proposed construction of a new bulk water supply pipeline and associated infrastructure from the farm Rheeboksfontein to Loeriesfontein Reservoir, Loeriesfontein. Botanical scan of the proposed route to determine the possible impact on vegetation and plant species. 30 May 2014.

Botes, P. 2014(b): Kalahari-East Water Supply Scheme Extension: Phase 1. Proposed extension of the Kalahari-East Water Supply Scheme and associated infrastructure to the Mier Municipality, ZF Mgcawu District Municipality, Mier Local Municipality (Northern Cape Province). Biodiversity & Botanical scan of the proposed route to determine the possible impact on biodiversity with emphasis on vegetation and plant species. 1 July 2014.

Botes, P. 2014(c): The proposed Freudenberg Farm Homestead, Farm no. 419/0, Tulbagh (Wolseley Area). A Botanical scan of possible remaining natural veld on the property. 26 August 2014.

Botes, P. 2014(d): Postmasburg WWTW: Proposed relocation of the Postmasburg wastewater treatment works and associated infrastructure, ZF Mgcawu District Municipality, Tsantsabane Local Municipality (Northern Cape Province). Biodiversity and botanical scan of the proposed pipeline route and WWTW site. 30 October 2014.

Botes, P. 2015(a): Jacobsbaai pump station and rising main (Saldanha Bay Municipality) (Revision). A Botanical Scan of the area that will be impacted by the proposed Jacobsbaai pump station and rising main. 21 January 2015.

Botes, P. 2015(b): Steenkampspan proving ground. Proposed establishment of a high speed proving (& associated infrastructure) on the farm Steenkampspan (No. 419/6), Upington, ZF Mgcawu (Siyanda) District Municipality, Northern Cape Province. Biodiversity and Botanical Scan of the proposed footprint. 20 February 2015.

Botes, P 2015(c): Proposed Bredasdorp Feedlot, Portion 10 of Farm 159, Bredasdorp, Cape Agulhas Municipality, Northern Cape Province. A Botanical scan of the area that will be impacted. 28 July 2015.

Botes, P. 2016(a): OWK Raisin processing facility, Upington, Erf 151, Kenhardt, Northern Cape Province. A Botanical scan of the proposed footprint. 26 May 2016.

Botes, P. 2016(b): Onseepkans Agricultural development. The proposed development of ±250 ha of new agricultural land at Onseepkans, Northern Cape Province. Biodiversity and Botanical Scan. January 2016.

Botes, P. 2016(c): Henkries Mega-Agripark development. The proposed development of ±150 ha of high potential agricultural land at Henkries, Northern Cape Province. Biodiversity and Botanical Scan of the proposed footprint. 28 February 2016.

Botes, P. 2016(d): Proposed Namaqualand Regional Water Supply Scheme high priority bulk water supply infrastructure upgrades from Okiep to Concordia and Corolusberg. Biodiversity Assessment of the proposed footprint. March 2016.

Botes, P. 2017: The proposed new Namaqua N7 Truck Stop on Portion 62 of the Farm Biesjesfontein No. 218, Springbok, Northern Cape Province. Botanical scan of the proposed footprint. 10 July 2017.

Botes, P. 2018(a): Kamiesberg Bulk Water Supply – Ground water desalination, borehole- and reservoir development, Kamiesberg, Northern Cape Province. Botanical scan of the proposed footprint. 20 February 2018

Botes, P. 2018(b): Rooifontein Bulk Water Supply – Ground water desalination, borehole- and reservoir development, Rooifontein, Northern Cape Province. Botanical scan of the proposed footprint. 23 February 2018

Botes, P. 2018(c): Paulshoek Bulk Water Supply – Ground water desalination, borehole- and reservoir development, Paulshoek, Northern Cape Province. Botanical scan of the proposed footprint. 27 March 2018.

Botes, P. 2018(d): Kakamas Wastewater Treatment Works Upgrade – Construction of a new WWTW and rising main, Khai !Garib Local Municipality, Northern Cape Province. Botanical assessment of the proposed footprint. 1 August 2018.

Botes, P. 2018(e): Kakamas Bulk Water Supply – New bulk water supply line for Kakamas, Lutzburg & Cillie, Khai !Garib Local Municipality, Northern Cape Province. Botanical assessment of the proposed footprint. 4 August 2018.

Botes, P. 2018(f): Wagenboom Weir & Pipeline – Construction of a new pipeline and weir with the Snel River, Breede River Local Municipality, Northern Cape Province. Botanical assessment of the proposed footprint. 7 August 2018.

Botes, P. 2018(g): Steynville (Hopetown) outfall sewer pipeline – Proposed development of a new sewer outfall pipeline, Hopetown, Northern Cape Province. Botanical assessment of the proposed footprint. 8 October 2018.

Botes, P. 2018(h): Tripple D farm agricultural development – Development of a further 60 ha of vineyards, Erf 1178, Kakamas, Northern Cape Province. Botanical assessment of the proposed footprint. 8 October 2018.

Botes, P. 2018(i): Steynville (Hopetown) outfall sewer pipeline – Proposed development of a new sewer outfall pipeline, Hopetown, Northern Cape Province. Botanical assessment of the proposed footprint. 8 October 2018.

Botes, P. 2019(a): Lethabo Park Extension – Proposed extension of Lethabo Park (Housing Development) on the remainder of the Farm Roodepan No. 70, Erf 17725 and Erf 15089, Roodepan Kimberley. Sol Plaaitje Local Municipality, Northern Cape Province. Botanical assessment of the proposed footprint (with biodiversity inputs). 15 May 2019.

Botes, P. 2019(b): Verneujkpan Trust agricultural development – The proposed development of an additional ±250 ha of agricultural land on Farms 1763, 2372 & 2363, Kakamas, Northern Cape Province. 27 June 2019.

Botes, P. 2020(a): Gamakor & Noodkamp Low cost housing – Botanical Assessment of the proposed formalization of the Gamakor and Noodkamp housing development on the remainder and portion 128 of the Farm Kousas No. 459 and Ervin 1470, 1474 and 1480, Gordonia road, Keimoes. Kai !Gariep Local Municipality, Northern Cape Province. 6 February 2020.

Botes, P. 2020(b): Feldspar Prospecting & Mining, Farm Rozynen Bosch 104, Kakamas. Botanical assessment of the proposed prospecting and mining activities on Portion 5 of The Farm Rozynen Bosch No. 104, Kakamas, Khai !Garib Local Municipality, Northern Cape Province. 12 February 2020.

Botes, P. 2020(c): Boegoeberg housing project – Botanical assessment of the proposed formalization and development of 550 new erven on the remainders of farms 142 & 144 and Plot 1890, Boegoeberg settlement, !Kheis Local Municipality, Northern Cape Province. 1 July 2020.

Botes, P. 2020(d): Komaggas Bulk Water supply upgrade – Botanical assessment of the proposed upgrade of the existing Buffelsrivier to Komaggas BWS system, Rem. of Farm 200, Nama Khoi Local Municipality, Northern Cape Province. 8 July 2020.

Botes, P. 2020(e): Grootdrink housing project – Botanical assessment of the proposed formalization and development of 370 new erven on Erf 131, Grootdrink and Plot 2627, Boegoeberg Settlement, next to Grootdrink, !Kheis Local Municipality, Northern Cape Province. 14 July 2020.

Botes, P. 2020(f): Opwag housing project – Botanical assessment of the proposed formalization and development of 730 new erven on Plot 2642, Boegoeberg Settlement and Farm Boegoeberg Settlement NO.48/16, Opwag, !Kheis Local Municipality, Northern Cape Province. 16 July 2020.

Botes, P. 2020(g): Wegdraai housing project – Botanical assessment of the Proposed formalization and development of 360 new erven on Erven 1, 45 & 47, Wegdraai, !Kheis Local Municipality, Northern Cape Province. 17 July 2020.

Botes, P. 2020(h): Topline (Saalskop) housing project – Botanical assessment of the pproposed formalization and development of 248 new erven on Erven 1, 16, 87, Saalskop & Plot 2777, Boegoeberg Settlement, Topline, !Kheis Local Municipality, Northern Cape Province. 18 July 2020.

Botes, P. 2020(i): Gariep housing project – Botanical assessment of the proposed formalization and development of 135 new erven on Plot 113, Gariep Settlement, !Kheis Local Municipality, Northern Cape Province. 20 July 2020.