

TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT

GWAINGRIVIER WASTE DISPOSAL FACILITY SITE, GEORGE.



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AUGUST 2026

DECLARATION OF THE SPECIALIST

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

I **Nicolaas Willem Hanekom**, as the appointed Specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that:

- In terms of the general requirement to be independent:
 - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the development proposal or application and that there are no circumstances that may compromise my objectivity; or
- In terms of the remainder of the general requirements for a specialist, have throughout this EIA process met all of the requirements;
- I have disclosed to the applicant, the EAP, the Review EAP (if applicable), the Department and I&APs all material information that has or may have the potential to influence the decision of the Department or the objectivity of any Report, plan or document prepared or to be prepared as part of the application; and
- I am aware that a false declaration is an offence in terms of Regulation 48 of the EIA Regulations.

Nicolaas Hanekom
Pri.Sci.Nat (Ecology) 004415

Signature of the ~~EAP~~/ Specialist:

20 August 2026

Date:

ENVIROEAP (PTY) LTD

Name of company (if applicable):

COMPLIANCE WITH THE DEPARTMENT OF ENVIRONMENTAL AFFAIRS SCREENING TOOL (GOVERNMENT NOTICE NO. 320, GOVERNMENT GAZETTE 43110: 20 MARCH 2020)

Department of Environmental Affairs screening Tool (Government Notice No. 320, GOVERNMENT GAZETTE 43110: 20 MARCH 2020)	ADDRESSED IN SPECIALIST REPORT
Contact details and curriculum vitae of the specialist including SACNASP registration number and field of expertise and their curriculum vitae	Page 1
A signed statement of independence by the specialist	Page 2 of report
Duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment	Section 1.8
A description of the methodology used to undertake the impact assessment and site inspection, including equipment and modelling used where relevant	Section 1.5
A description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations	Section 1.6
Areas not suitable for development, to be avoided during construction and operation (where relevant)	Section 5
Additional environmental impacts expected from the proposed development based on those already evident on the site and a discussion on the cumulative impacts	Section 6
Impact management actions and impact management outcomes proposed by the specialist for inclusion in the EMPr	Section 6
A motivation where the development footprint identified as per section 2.3 in this Table were not considered stating reasons why these were not being considered	Section 1 and 7
A reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not of the development and if the development should receive approval or not, and any conditions to which the statement is subjected	Section 7

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1. INTRODUCTION AND METHODOLOGY

The Department of Environmental Affairs screening report from the national web based environmental screening tool reported a “Very High for Terrestrial Biodiversity” sensitivity due to mapped CBA 1: Terrestrial and Garden Route Granite Fynbos with a Critical Endangered Ecosystem Status. A terrestrial biodiversity impact assessment was conducted. This report presents the findings of the Terrestrial Biodiversity Impact Assessment that was prepared by Nicolaas Hanekom as part of the S24G application for the Gwaing River Waste Disposal Facility Site.

This assessment focussed on five (5) footprints which are related to the scope of the section 24G application viz, namely:

The existing Licensed footprint = 126 800m²;

The total extent of the waste body within the Licensed footprint = 44 400m²;

The unlawfully extended area with a portion of the waste body = 22 400m²;

The proposed expansion / offset area = 69 200m²; and

The development footprint noted as 66 800m² / 14 000m².

1.1. Background & Competency

Nicolaas Hanekom is a registered Professional Natural Scientist in the ecological science field with the South African Council for Natural Scientific Professions (“SACNASP”), (Ecological Science (Pri.Sci.Nat); Aquatic Science, Zoological & Conservation Science (Cand.Sci.Nat) and a qualified registered Environmental Assessment Practitioner (“EAP”) who holds a Masters Technologiae, Nature Conservation (“Vegetation Ecology and Biodiversity Assessment”) degree from the Cape Peninsula University of Technology (Refer to Appendix A, CV). Nicolaas Hanekom is suitably qualified SACNASP registered specialist.

1.2. Conditions Relating to this Report

The findings, results, observations, conclusions and recommendations given in this report are based on the author’s best scientific and professional knowledge as well as available information and knowledge of the area. Nicolaas Hanekom reserves the right to modify aspects of the report including the recommendations if and when new information may become available from on-going research or further work in this field, pertaining to this assessment.

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

1.3. Scope and Objectives

The assessments entailed both a literature review of the region, as well as on site evaluations, during which specific primary data will be collected and evaluated. In addition, the identification of key ecological features will be undertaken allowing for the interpretation of the prevailing habitat form and associated processes.

All data collected in the field and during the literature review will be evaluated and interpreted in order to provide an understanding of the nature of the prevailing environment at a landscape and habitat level. In addition, specific evaluation of data relating to habitat form and structure will be undertaken, aiding in the identification of bio-physical anomalies within the prevailing environment. Such variance may be considered to be indicative of differing habitat forms, which under consideration, may be of higher order ecological value in relation of the prevailing environment.

The protocol¹ provides the criteria for the reporting of requirements for the assessment and reporting of impacts on terrestrial biodiversity for activities requiring environmental authorisation.

General Information

An applicant intending to undertake an activity identified in the Scope of this Protocol, on a site identified as being of “very high sensitivity” for terrestrial biodiversity on the national web based environmental screening tool must submit a Terrestrial Biodiversity Impact Assessment Report. However, where the information gathered from the Initial Site Sensitivity Verification and the specialist assessment differs from the designation of “very high” terrestrial biodiversity sensitivity from the national web based environmental screening tool and it is found to be of a “low” sensitivity, then a terrestrial biodiversity impact assessment is not required. Should this apply, a Terrestrial Biodiversity Compliance Statement is to be provided.

1.4. Methodology Terms of Reference

The assessment must be undertaken by a suitably qualified and SACNASP registered specialist, within the preferred development site and on the preferred development footprint. The description of the preferred site must include the following aspects, as a minimum and must be considered in the baseline description:

- A description of the ecological drivers/processes of the system and how the proposed development will impact these;
- Ecological functioning and ecological processes (e.g. fire, migration, pollination, etc.) that operate within the proposed development site;
- The ecological corridors that the development would impede including migration and movement of flora and fauna;
- The description of any significant landscape features (including rare or important flora/faunal associations, presence of Strategic Water Source Areas (SWSAs) or Freshwater Ecosystem Priority Areas (FEPA) sub-catchments;
- The description of the terrestrial biodiversity and ecosystems on the proposed development site must include:
 - Main vegetation types;
 - Threatened ecosystems, including Listed Ecosystems as well as locally important habitat types identified;
 - Ecological connectivity, habitat fragmentation, ecological processes and fine-scale habitats; and

¹ Published in Government Notice No. 320 GOVERNMENT GAZETTE 43110 20 MARCH 2020. This gazette is also available free online at www.gpwonline.co.za

- Species, distribution, important habitats (e.g. feeding grounds, nesting sites, etc.) and movement patterns identified.

The assessment must identify any alternative development footprints within the preferred development site which would be of a “low” sensitivity as identified by the national web based environmental screening tool and verified through the Initial Site Sensitivity Verification. The Terrestrial Biodiversity Impact Assessment must be based on the results of a site inspection undertaken on the preferred development site and must identify:

The assessment report must describe Terrestrial Critical Biodiversity Areas (CBAs), including:

- The reasons why an area has been identified as a CBA;
- An indication of whether or not the development is consistent with maintaining the CBA in a natural or near natural state or in achieving the goal of rehabilitation;
- The impact on species composition and structure of vegetation with an indication of the extent of clearing activities;
- The impact on ecosystem threat status;
- The impact on explicit subtypes in the vegetation;
- The impact on overall species and ecosystem diversity of the site; and
- The impact on populations of species of special concern in the CBA.

The assessment report must describe Terrestrial Ecological Support Areas, including:

- The impact on the ecological processes that operate within or across the site;
- The extent the development will impact on the functionality of the ESA; and
- Loss of ecological connectivity (on site, and in relation to the broader landscape) due to the degradation and severing of ecological corridors or introducing barriers that impede migration and movement of flora and fauna.

The assessment report must describe Protected Areas as defined by the National Environmental Management: Protected Areas Act, 2004 including an opinion on whether the proposed development aligns with the objectives/purpose of the Protected Area and the zoning as per the Protected Area Management Plan.

The assessment report must describe Priority Areas for Protected Area Expansion, including the way in which the development will compromise or contribute to the expansion of the protected area network.

The assessment report must describe Strategic Water Source Areas (SWSA) including:

- The impact(s) on the terrestrial habitat of a Strategic Water Source Area, and
- The impacts of the development on the SWSA water quality and quantity (e.g. describing potential increased runoff leading to increased sediment load in water courses).

The assessment report must describe Freshwater Ecosystem Priority Area (FEPA) sub catchments, including the impacts of the development on habitat condition and/or species in the FEPA sub catchment, including National wetland map 5.

The assessment report must describe Indigenous Forests, including:

- Impact on the ecological integrity of the forest;
- Extent of natural or near natural indigenous forest area lost.

The findings of the Terrestrial Biodiversity Impact Assessment must be written up in a Terrestrial Biodiversity Impact Assessment Report. This report must include as a minimum the following information:

- Contact details and curriculum vitae of the specialist including SACNASP registration number and field of expertise and their curriculum vitae;
- A signed statement of independence by the specialist;
- Duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;
- A description of the methodology used to undertake the impact assessment and site inspection, including equipment and modelling used where relevant;
- A description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations;
- Areas not suitable for development, to be avoided during construction and operation (where relevant);
- Additional environmental impacts expected from the proposed development based on those already evident on the site and a discussion on the cumulative impacts;
- Impact management actions and impact management outcomes proposed by the specialist for inclusion in the EMPr;
- A motivation why any alternative development footprints within the preferred development site which would be of a “low” sensitivity as identified by the national web based environmental screening tool were not considered stating reasons why these were not being not considered; and
- A reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not of the development and if the development should receive approval or not, and any conditions to which the statement is subjected.

1.5. Approach and Methodology

A literature review and desktop analysis were undertaken prior to the field investigation, utilizing various sources including the South African National Biodiversity Institute (SANBI) data and other relevant sources. Recent and historical aerial imagery of the site was reviewed in order to identify points for investigation during the field survey. Utilising the above information, a field investigation was undertaken whereby:

- Sites of geomorphological or topographic variance were identified and subjected to an evaluation of species present within transects established across the selected site.
- Species were identified and collated.
- Additional random sample points were selected from other sites surrounding the proposed impacted areas for comparative purposes.
- Any additional species of significance, not identified within the sample sites were also noted.

As explained below, the ideal period for the assessment of habitat within this region is between August and end October months. The site survey was conducted on 1 November 2024 and 30 October 2025. The timing of the survey is optimal.

All data was collated and subjected to evaluation using methods in order to:

- Give consideration to the overall structure of habitat within the subject site.
- Identify any habitat anomalies that may be identified in such analysis.
- Allow for the interpretation of such data in order to prioritise and evaluate habitat form and

structure within the study area.

1.6. Assumptions and limitations

The presence of fauna must be evaluated based on the literature and available databases but in many cases, these databases are not intended for fine-scale use and the reliability and adequacy of these data sources relies heavily on the extent to which the area has been sampled in the past. Many areas have not been well sampled with the result that the species lists derived for the area do not always adequately reflect the actual fauna and flora present at the site. This is acknowledged as a limitation of the study, however it is substantially reduced through extracting the species lists for a substantially larger area than the site and through the inclusion of information from previous experience in the wider area. The assessment was undertaken using sampling methods appropriate to the protocols, terms of reference and methodologies described above. The timing of the survey is therefore regarded as optimal in terms of accurately assessing the flora and fauna of the site. The overall condition of the vegetation was determined with a high degree of confidence. An accurate idea of the priority conservation areas, animals and botanical species was gained, due to the use of a combined habitat and species-based approach, and confidence in the accuracy of the findings is high. The overall confidence in the completeness and accuracy of the terrestrial biodiversity findings at this point in time is considered to be good. A follow-up survey is not considered essential for decision-making.

1.7. Source of Information

This assessment was undertaken utilising:

- 1:50 000 topographic mapping sourced from the Surveyor General's office;
- Aerial imagery sourced from Google Earth.
- Vegetation types and their conservation status was extracted from the South African National Vegetation Map (Dayaram et al., 2018;).
- Information on plant and animal species recorded for the Quarter Degree Squares (QDS) was extracted from the SABIF/SIBIS database hosted by SANBI.
- Threatened Ecosystem data was extracted from the National List of Threatened Ecosystems 2022.
- Freshwater and wetland information was extracted from the National Freshwater Ecosystem Priority Areas assessment, NFEPA (Nel et al. 2011) and National Wetlands Map.
- Important catchments and protected areas expansion areas were extracted from the National Protected Areas Expansion Strategy 2023 (NPAES).
- CapeNature. 2024. 2023 Western Cape Biodiversity Spatial Plan and Guidelines Overview V2.0. Unpublished Report.

In addition, use was made of the following data:

- Wetland and riparian habitat Geographic Information System (GIS) data sourced from the National Freshwater Ecological Priority Area Programme of South African National Biodiversity Institute (SANBI);
- SANBI veld types data; and
- Literature as referenced

1.8. Site Visit

The impact assessment considering the consequences on unlawful commencement.

The site survey was conducted on 1 November 2024, which is an optimal time for surveys. The survey was conducted in an ideal period for the assessment of terrestrial biodiversity within this region. The sampling and analysis of the site during this season provides suitable data and results to present an informed decision. During the site visit, the different biodiversity features, habitat, vegetation and landscape units present were identified and recorded in the field. Walk-through-surveys were conducted of representative habitats and areas of interest and all animal and plant species observed were recorded. Searches for listed and protected animal and plant species at the site were conducted and the location of all listed animal and plant species observed was recorded (if present).

Garden Route Granite Fynbos, with a critically endangered ecosystem status which is outside on the northern edge of the Waste Disposal Facility site footprint and associated with the non-perennial tributary of the Gwaingrivier was mapped. Cape Lowland Alluvial Vegetation with an endangered ecosystem status on the western edge outside the Waste Disposal Facility site and associated with the Gwaingrivier was also mapped. The edge effects from the Waste Disposal Facility site operations will affect these mapped vegetation types and its ecology, but the impacts, mitigation measures and management actions will be applicable to the Aquatic Biodiversity Assessment.

The northern edge and northwestern corner of the Waste Disposal Facility site area is located inside a CBA and ESA. The non-perennial tributary and the Gwaingrivier and its buffer areas were mapped as:

Terrestrial Portion

Critical Biodiversity Areas (Degraded)

Category 1: CBA2: Terrestrial

Category 2: CBA2: Terrestrial

Definition: Areas in a degraded or secondary condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure.

Objective: Maintain in a natural or near-natural state, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land-uses are appropriate.

Aquatic portion

Critical Biodiversity Areas

Category 1: CBA: Aquatic

Category 2: CBA: Wetland

Definition: Areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure.

Objective: Maintain in a natural or near-natural state, with no further loss of natural habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land uses are appropriate.

Ecological Support Areas (Restore)

Feature: River, Wetland

Category 1: ESA2: Restore from other land use

Definition: Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services.

Objective: Restore and/or manage to minimize impact on ecological processes and ecological infrastructure functioning, especially soil and water-related services, and to allow for faunal movement.

These CBA;s and ESA are incorrectly Mapped. The Northwestern corner historically was impacted by a quarry and the northern edge by cultivated lands.



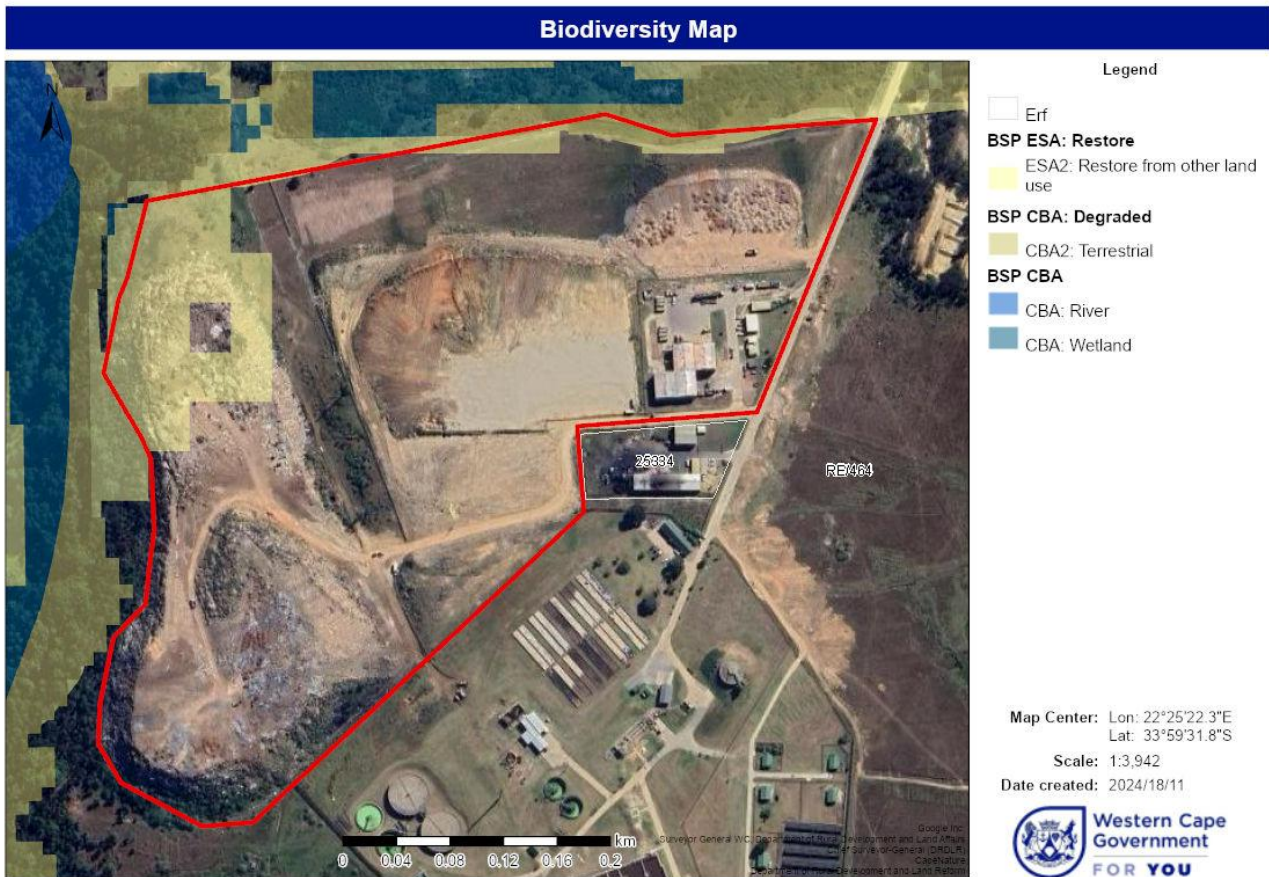


Figure 1: Terrestrial Biodiversity Map



Photograph 1: Ecological condition of the northern edge. Outside the Waste Disposal Facility site area.



Photograph 2: Ecological condition of the northern edge. Inside the Waste Disposal Facility site area.



Photograph 3: Ecological condition of the Waste Disposal Facility site. Northwestern corner.



Photograph 4: Ecological condition of the western edge on area where Waste Disposal Facility site was expanded outside the license footprint.

The impact assessment considering the consequences on the preferred alternative included in the section 24G Application.

The site survey was conducted on 30 October 2025, which is an optimal time for surveys. The survey was conducted in an ideal period for the assessment of terrestrial biodiversity within this region. The sampling and analysis of the site during this season provides suitable data and results to present an informed decision. During the site visit, the different biodiversity features, habitat, vegetation and landscape units present were identified and recorded in the field. Walk-through-surveys were conducted of representative habitats and areas of interest and all animal and plant species observed were recorded. Searches for listed and protected animal and plant species at the site were conducted and the location of all listed animal and plant species observed was recorded (if present).

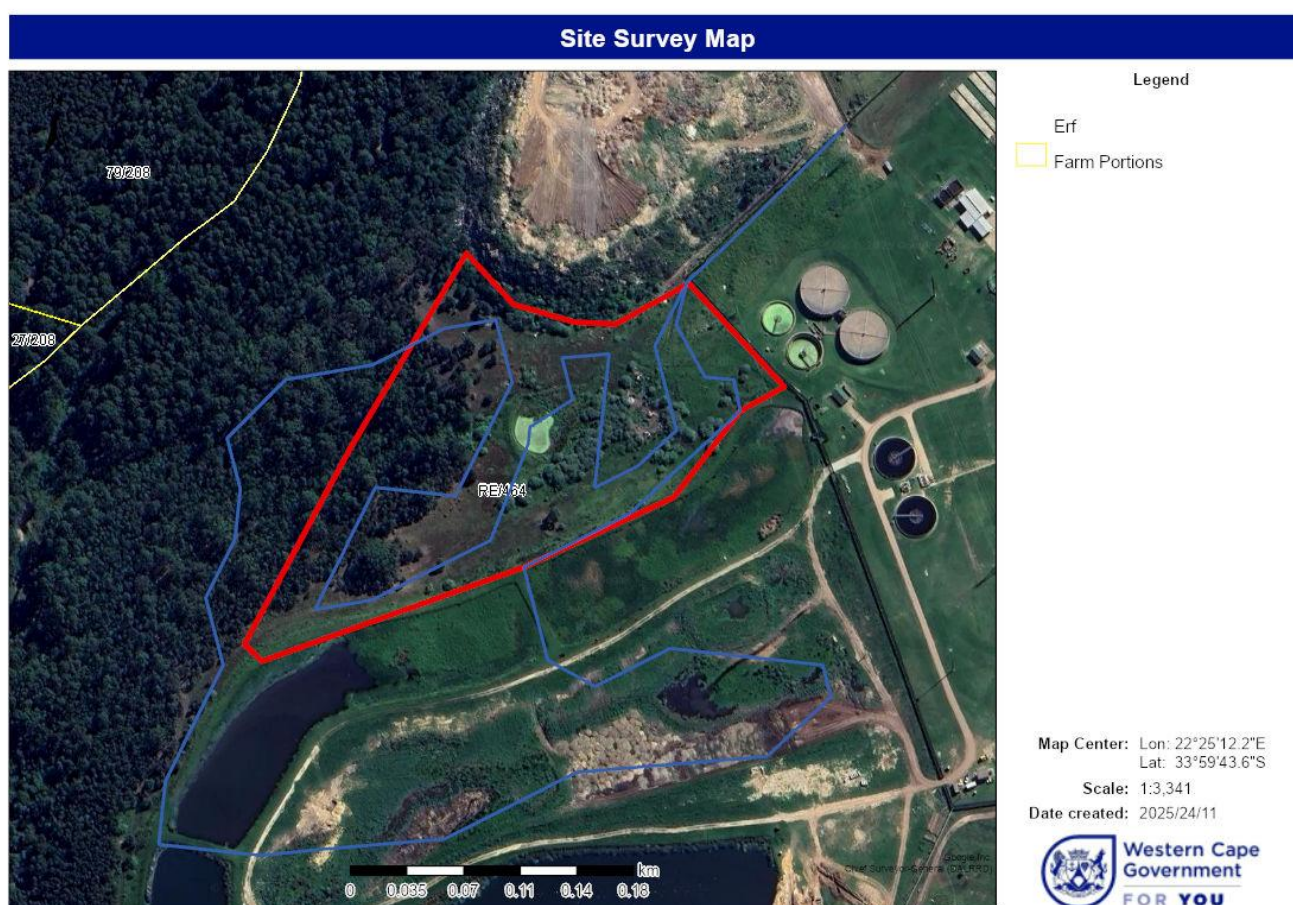


Figure 2: Site Survey Map. Reg polygon proposed site and blue line – survey route

Garden Route Granite Fynbos, with a critically endangered ecosystem status on the proposed expansion footprint was mapped. Cape Lowland Alluvial Vegetation with an endangered ecosystem status on the western edge associated with the Gwaing River was also mapped outside the proposed site. The edge effects from the Waste Disposal Facility site operations will affect these mapped vegetation types and its ecology, but the impacts, mitigation measures and management actions will be applicable to the Aquatic Biodiversity Assessment.

The whole proposed site is located inside a Critical Biodiversity Areas (CBA). This CBA was incorrectly mapped as the whole site is degraded and habitat functionality that support plant species and ecological process is lost.

CBA

Name: Garden Route Granite Fynbos

Condition: Natural

Category 1: CBA: Terrestrial

Category 2: CBA: Threatened Ecosystem

Definition: Areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure.

Objective: Maintain in a natural or near-natural state, with no further loss of natural habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land uses are appropriate.



Figure 3: Google earth image of proposed site.



Figure 4: DWS Aerial 2000 Map of proposed site.



Figure 5: Terrestrial Biodiversity Map

FFg 5 Drews (1980b), Hoare et al. (2000) Garden Route Granite Fynbos.

Vegetation & Landscape Features Moderately undulating plains and undulating hills on the coastal forelands. Dense proteoid and ericoid shrubby grassland. Proteoid and graminoid fynbos are dominant with ericaceous fynbos in seeps. In the west, most remnants of this type are dominated by proteas. Eastwards graminoid and ericaceous fynbos are dominant on the flat plateaus, with proteas confined to the steep slopes.

Important Taxa Tall Shrubs: *Passerina corymbosa* (d), *Cliffortia serpyllifolia*, *Protea coronata*, *P. lanceolata*, *P. neriifolia*. Low Shrubs: *Erica discolor* variant 'speciosa' (d), *E. peltata* (d), *Phyllica confusa* (d), *Syncarpha paniculata* (d), *Agathosma ovata*, *Anthospermum prostratum*, *Aspalathus asparagoides*, *Cliffortia falcata*, *Cullumia bisulca*, *Erica canaliculata*, *E. diaphana*, *E. formosa*, *Eriocephalus africanus*, *Hermannia angularis*, *Leucadendron salignum*, *Lobelia tomentosa*, *Metalasia pungens*, *Mimetes cucullatus*, *Pelargonium fruticosum*, *Relhania calycina*. Succulent Shrub: *Lampranthus sociorum*. Semiparasitic Shrubs: *Osyris compressa*, *Thesium virgatum*. Semiparasitic Epiphytic Shrub: *Viscum capense*. Geophytic Herb: *Schizaea pectinata*. Graminoids: *Tetraria cuspidata* (d), *Brachiaria serrata*, *Eragrostis capensis*, *Ficinia nigrescens*, *Heteropogon contortus*, *Pentaschistis eriostoma*, *Restio triticeus*, *Themeda triandra*.

The site is transformed as a result of previous clearing and disturbances to the topsoil and vegetation. The plant species and vegetation structure recorded during the survey does not represent dense proteoid and ericoid shrubby grassland associated with Garden Route

Granite Fynbos. Proteoid and graminoid fynbos dominant with ericaceous fynbos were also not recorded in seeps or floodplain area of the Gwaing River.

The plants recorded during the survey were *Rumex crispus*, *Erica canaliculate* (one plant), *Lobelia coronopifolia*, *Senecio erosus*, *Arctotheca calendula*, *Helichrysum petiolare*, *Passerina corymbose* (one plant), *Pentaschistis eriostoma*, *Acacia mearnsii*, *Eucalyptus sp*, *Cirsium vulgare*, *Solanum mauretanium* and *Stenotaphrum secundatum*.

The transformed nature of the site resulted in the area being mapped having very low sensitivity in terms of plant species and terrestrial biodiversity. This confirms the site visit results and the transformed state of the area. No Threatened or Protected Species were recorded on site and unlikely that they will occur on site due to the transformed state of the area.



Photograph 5: Ecological and vegetation habitat condition of assessed site



Photograph 6: Ecological and vegetation habitat condition of assessed site



Photograph 7: Ecological and vegetation habitat condition of assessed site



Photograph 8: Ecological and vegetation habitat condition of assessed site



Photograph 9: Ecological and vegetation habitat condition of assessed site



Photograph 10: Ecological and vegetation habitat condition of assessed site

1.9. Sensitivity Mapping and Assessment

The impact assessment considering the consequences on the preferred alternative included in the section 24G Application.

Project Area of Influence (PAOI)

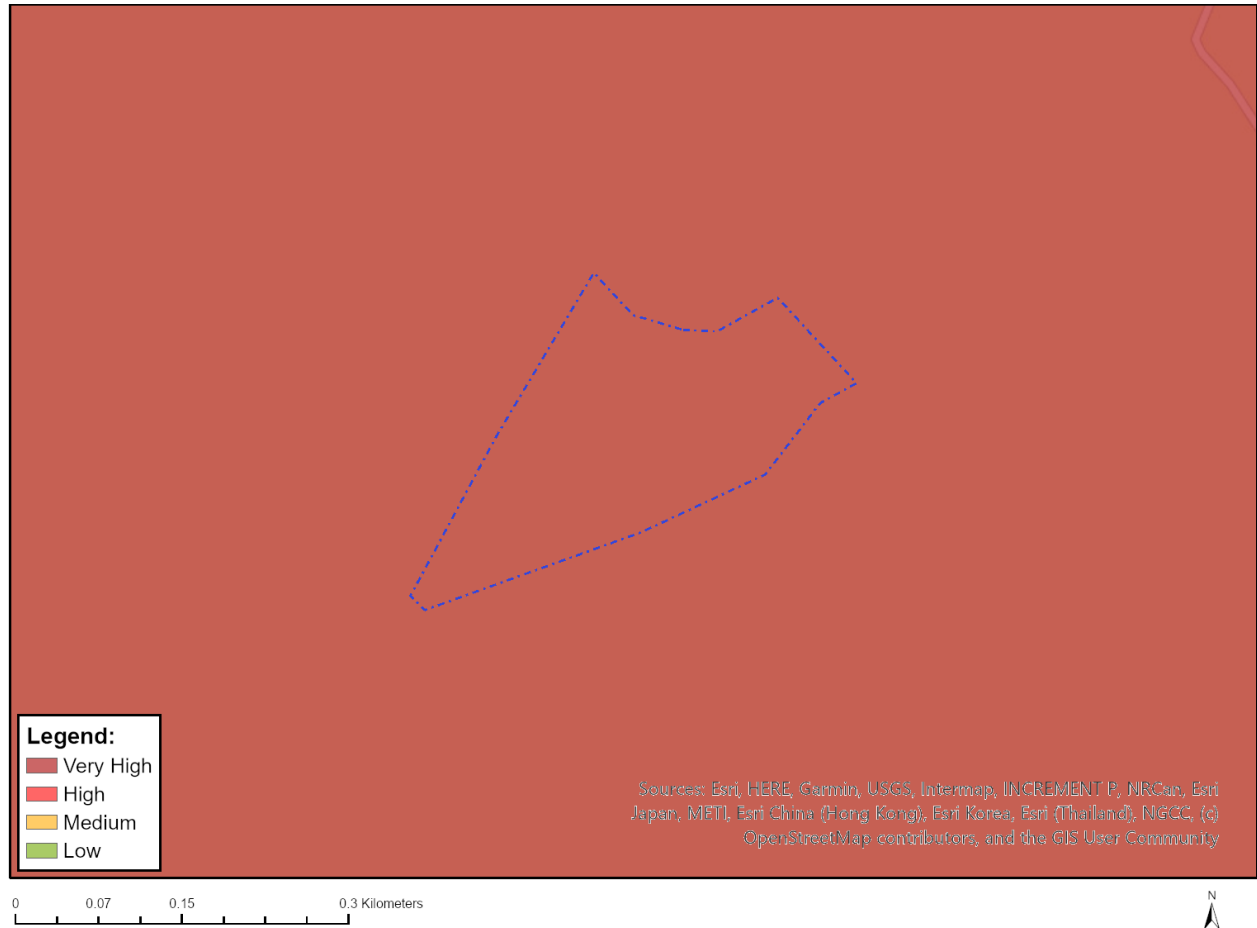


Figure 6: Project Area of Influence Map

Sensitivity Mapping and Assessment (Site Ecological Importance)²

Where the site-specific assessment produces lower or higher SEI classification than the 'environmental sensitivity' output of the screening tool for that particular site, it is the responsibility of the specialist to provide a clear and defensible justification for the difference. SEI is considered to be a function of the biodiversity importance (BI) of the receptor (e.g. species of conservation concern, the vegetation/fauna community or habitat type present on the site and its resilience to impacts (receptor resilience [RR]) as follows:

$$SEI = BI + RR$$

² South African National Biodiversity Institute (SANBI). 2020. *Species Environmental Assessment Guideline. Guidelines for the implementation of the Terrestrial Fauna and Terrestrial Flora Species Protocols for environmental impact assessments in South Africa*. South African National Biodiversity Institute, Pretoria. Version 3.1. 2022.

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

$$BI = CI + FI$$

Conservation importance (CI) is evaluated in accordance with recognised established internationally acceptable principles and criteria for the determination of biodiversity-related value, including the IUCN Red List of Species, Red List of Ecosystems and Key Biodiversity Areas (KBA; IUCN [2016]).

Conservation importance is defined here as:

“The importance of a site for supporting biodiversity features of conservation concern present, e.g. populations of IUCN threatened and Near Threatened species (CR, EN, VU and NT), Rare species, range-restricted species, globally significant populations of congregatory species, and areas of threatened ecosystem types, through predominantly natural processes.”

These criteria are defined as follows:

IUCN threatened and Near Threatened species (CR, EN, VU and NT) are defined as either the global or national assessments of the risk of extinction as evaluated by a dedicated panel of species specialists according to the criteria of the International Union for The Conservation of Nature (www.iucnredlist.org). Where the global and national assessments differ for the same taxon, the national evaluation of status should be used in calculating SEI unless the global assessment is both more recent and of a more threatened category. It is important to note that the specialist is required to have a firm understanding of the IUCN Red List Categories and Criteria (IUCN 2012) in order to appropriately apply these for the evaluation of SEI. This criterion can be assessed using confirmed occurrences of species or the suitability of the habitat to support these species.

Rare species are those included on South Africa’s National Red List as Rare or Critically Rare or Extremely Rare. These are highly restricted species that are currently not declining. However, should any development impact on a population of these species they will immediately qualify under one of the IUCN categories of threat.

Range-restricted species – the presence of terrestrial flora, vertebrate and invertebrate fauna with a global population extent of occurrence (EOO) of 10 000 km² or less.

Globally significant populations of congregatory species – a roughly estimated proportion (%) of the global population of a fauna species that congregate for breeding/feeding/hibernation/other reasons.

Significant areas of threatened vegetation types – this is a function of both the area (size) being considered in relation to the total extent of that vegetation type (i.e. proportion) and how threatened (CR, EN, VU) the vegetation types are.

Natural processes – natural unmanaged areas with low levels of ecological disturbance have largely intact natural processes such as pollination, seed dispersal and migration, and thus have greater intrinsic conservation importance than those that are modified through ecological disturbance.

While most of the features that will be included in the CI will be provided by the screening tool, it is important to note that CI is evaluated at a much finer spatial scale and based on fieldwork data collection and comprehensive desktop analyses performed by the specialist during the EA process. As a minimum requirement, CI needs to be determined for each identified habitat within the project footprint/PAOI, but best practice recommendation is that it should be determined for all habitats within the entire PAOI.

Fulfilling criteria to evaluate CI do not rely on a single specific threshold for each of the above defining characteristics but can act in combination or in isolation, providing a more robust evaluation of CI as per table below.

Conservation importance	Fulfilling criteria
Very high	Confirmed or highly likely occurrence of CR, EN, VU or Extremely Rare or Critically Rare species that have a global EOO of < 10 km ² . Any area of natural habitat of a CR ecosystem type or large area (> 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type. Globally significant populations of congregatory species (> 10% of global population).
High	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km ² . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A, if listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining. Small area (> 0.01% but < 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (> 0.1%) of natural habitat of VU ecosystem type. Presence of Rare species. Globally significant populations of congregatory species (> 1% but < 10% of global population).
Medium	Confirmed or highly likely occurrence of populations of NT species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals. Any area of natural habitat of threatened ecosystem type with status of VU. Presence of range-restricted species. > 50% of receptor contains natural habitat with potential to support SCC.
Low	No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species. < 50% of receptor contains natural habitat with limited potential to support SCC.
Very low	No confirmed and highly unlikely populations of SCC. No confirmed and highly unlikely populations of range-restricted species.

	No natural habitat remaining.
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Furthermore, while CI is most likely to be assessed based on data collected during the fieldwork survey, it can also be an assessment of the suitability of the receptor to support populations conforming to the fulfilling criteria. As can be seen from the worked example below, each of these evaluations of the fulfilling criteria demand necessary justification.

Functional integrity (FI) of the receptor (e.g. the vegetation/fauna community or habitat type) is defined here as the receptors' current ability to maintain the structure and functions that define it, compared to its known or predicted state under ideal conditions. Simply stated, FI is:

'A measure of the ecological condition of the impact receptor as determined by its remaining intact and functional area, its connectivity to other natural areas and the degree of current persistent ecological impacts.'

These criteria can be defined as:

- Connectivity to other natural areas – connectivity, which can also be measured conversely as the degree of habitat fragmentation, refers to how connected habitat patches are to each other, which has a significant influence on numerous ecological process, such as migration and dispersal opportunities of biota and therefore genetic exchange between populations. Connectivity to other similar habitats becomes more important as the remaining intact and functional area of a habitat decreases, mainly because population sizes decrease and are therefore at greater risk from ecological perturbations and inbreeding effects. The degree of connectivity between habitat patches varies greatly with the dispersal ability of the taxon or taxon group (e.g. fossorial reptiles) in question.
- Degree of current persistent negative ecological impacts – persistent negative impacts such as uncontrolled spread of alien and invasive flora effectively decreases both the remaining intact area and ecosystem functioning of a particular habitat.
- Remaining intact and functional area – the proportion of the receptor that supports natural habitat with intact ecological processes – small areas are less likely to withstand ecological degradation compared to large areas, and the latter are therefore better able to maintain structure and function allowing for intact ecological processes.

$$SEI = BI + RR$$

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

CI = **low**. Reason be that the vegetation and habitat has been lost. That no Species of Conservation Concern was mapped. The whole site historically was impacted by cultivated lands.

FI= **low**. Reason be that the vegetation and habitat has been lost. That no Species of Conservation Concern was mapped. The whole site historically was impacted by cultivated lands.

$$BI = CI + FI$$

Therefore, using table below, the BI was assessed to be **low** (CI **low** = and FI = **low**)
 Recalling that biodiversity importance (BI) is a function of conservation importance (CI) and the functional integrity (FI) of a receptor, BI can be derived from a simple matrix of CI and FI as per table below.

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

Receptor resilience (RR) is defined here as:

‘The intrinsic capacity of the receptor to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention.’

The fulfilling criteria to evaluate RR are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor (refer to table below) and will require justification by the specialist. The specialist needs to bear in mind that resilience will often be linked to a particular disturbance or impact, or even time of year, and needs to be described in relation to these factors. Receptor resilience needs to be evaluated by the specialist and justification for each evaluation must be provided in the report.

Resilience	Fulfilling criteria
Very high	Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of returning to a site once the disturbance or impact has been removed.
High	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Medium	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or

	species that have a moderate likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a moderate likelihood of returning to a site once the disturbance or impact has been removed.
Low	Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a low likelihood of returning to a site once the disturbance or impact has been removed.
Very low	Habitat that is unable to recover from major impacts, or species that are unlikely to remain at a site even when a disturbance or impact is occurring, or species that are unlikely to return to a site once the disturbance or impact has been removed.

The RR = **very high**. Reason be that the vegetation and habitat has been lost. That no Species of Conservation Concern was mapped. The whole site historically was impacted by cultivated lands.

Finally, after the successful evaluation of both BI and RR as described above, it is possible to evaluate SEI from the final matrix below.

SEI should be described in the above manner for each impact receptor within the PAOI and clearly mapped in relation to the proposed development activities and infrastructure. Interpretation of SEI in the context of the proposed development activities as per table below must be provided by the specialist. It is very important to note that SEI is specific to the proposed development activities and cannot be meaningfully compared between different proposed projects with different associated activities on the same spatial location. However, SEI for the same proposed development with multiple alternative layouts and/or locations may be compared within the same study.

$$\text{SEI (very low)} = \text{BI (low)} + \text{RR (very high)}$$

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

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

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

The Waste Disposal Facility site has a **very low** SEI on the PAOI.

The impact assessment considering the consequences on unlawful commencement.

Project Area of Influence (PAOI)

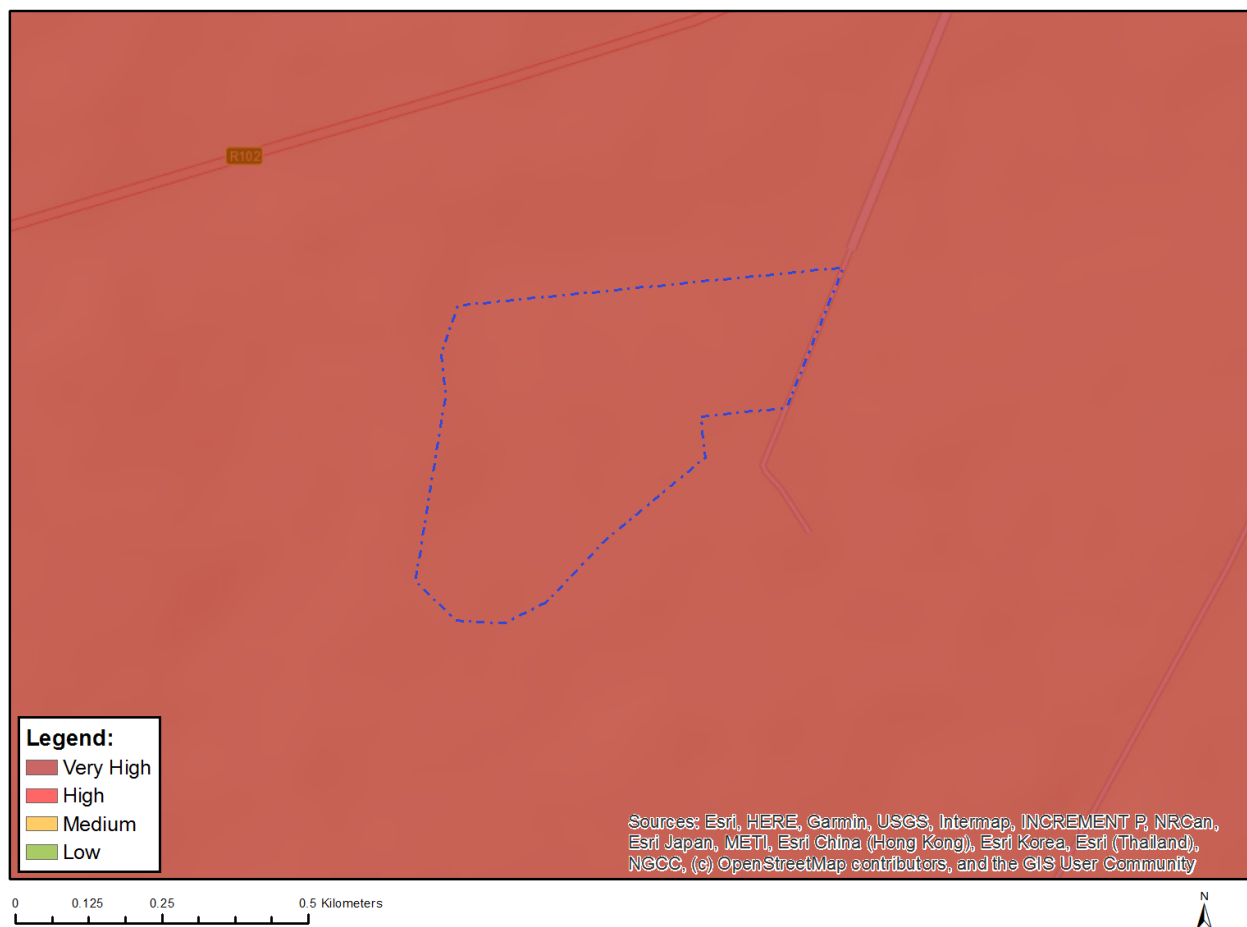


Figure 7: Project Area of Influence Map

Sensitivity Mapping and Assessment (Site Ecological Importance)³

Where the site-specific assessment produces lower or higher SEI classification than the 'environmental sensitivity' output of the screening tool for that particular site, it is the responsibility of the specialist to provide a clear and defensible justification for the difference. SEI is considered to be a function of the biodiversity importance (BI) of the receptor (e.g. species of conservation concern, the vegetation/fauna community or habitat type present on the site and its resilience to impacts (receptor resilience [RR]) as follows:

$$\text{SEI} = \text{BI} + \text{RR}$$

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

$$\text{BI} = \text{CI} + \text{FI}$$

Conservation importance (CI) is evaluated in accordance with recognised established internationally acceptable principles and criteria for the determination of biodiversity-related value, including the IUCN Red List of Species, Red List of Ecosystems and Key Biodiversity Areas (KBA; IUCN [2016]).

Conservation importance is defined here as:

“The importance of a site for supporting biodiversity features of conservation concern present, e.g. populations of IUCN threatened and Near Threatened species (CR, EN, VU and NT), Rare species, range-restricted species, globally significant populations of congregatory species, and areas of threatened ecosystem types, through predominantly natural processes.”

These criteria are defined as follows:

IUCN threatened and Near Threatened species (CR, EN, VU and NT) are defined as either the global or national assessments of the risk of extinction as evaluated by a dedicated panel of species specialists according to the criteria of the International Union for The Conservation of Nature (www.iucnredlist.org). Where the global and national assessments differ for the same taxon, the national evaluation of status should be used in calculating SEI unless the global assessment is both more recent and of a more threatened category. It is important to note that the specialist is required to have a firm understanding of the IUCN Red List Categories and Criteria (IUCN 2012) in order to appropriately apply these for the evaluation of SEI. This criterion can be assessed using confirmed occurrences of species or the suitability of the habitat to support these species.

Rare species are those included on South Africa's National Red List as Rare or Critically Rare or Extremely Rare. These are highly restricted species that are currently not declining. However, should any development impact on a population of these species they will immediately qualify under one of the IUCN categories of threat.

³ South African National Biodiversity Institute (SANBI). 2020. *Species Environmental Assessment Guideline. Guidelines for the implementation of the Terrestrial Fauna and Terrestrial Flora Species Protocols for environmental impact assessments in South Africa*. South African National Biodiversity Institute, Pretoria. Version 3.1. 2022.

Range-restricted species – the presence of terrestrial flora, vertebrate and invertebrate fauna with a global population extent of occurrence (EOO) of 10 000 km² or less.

Globally significant populations of congregatory species – a roughly estimated proportion (%) of the global population of a fauna species that congregate for breeding/feeding/hibernation/other reasons.

Significant areas of threatened vegetation types – this is a function of both the area (size) being considered in relation to the total extent of that vegetation type (i.e. proportion) and how threatened (CR, EN, VU) the vegetation types are.

Natural processes – natural unmanaged areas with low levels of ecological disturbance have largely intact natural processes such as pollination, seed dispersal and migration, and thus have greater intrinsic conservation importance than those that are modified through ecological disturbance.

While most of the features that will be included in the CI will be provided by the screening tool, it is important to note that CI is evaluated at a much finer spatial scale and based on fieldwork data collection and comprehensive desktop analyses performed by the specialist during the EA process. As a minimum requirement, CI needs to be determined for each identified habitat within the project footprint/PAOI, but best practice recommendation is that it should be determined for all habitats within the entire PAOI.

Fulfilling criteria to evaluate CI do not rely on a single specific threshold for each of the above defining characteristics but can act in combination or in isolation, providing a more robust evaluation of CI as per table below.

Conservation importance	Fulfilling criteria
Very high	Confirmed or highly likely occurrence of CR, EN, VU or Extremely Rare or Critically Rare species that have a global EOO of < 10 km ² . Any area of natural habitat of a CR ecosystem type or large area (> 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type. Globally significant populations of congregatory species (> 10% of global population).
High	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km ² . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A, if listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining. Small area (> 0.01% but < 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (> 0.1%) of natural habitat of VU ecosystem type. Presence of Rare species. Globally significant populations of congregatory species (> 1% but < 10% of global population).

Medium	Confirmed or highly likely occurrence of populations of NT species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals. Any area of natural habitat of threatened ecosystem type with status of VU. Presence of range-restricted species. > 50% of receptor contains natural habitat with potential to support SCC.
Low	No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species. < 50% of receptor contains natural habitat with limited potential to support SCC.
Very low	No confirmed and highly unlikely populations of SCC. No confirmed and highly unlikely populations of range-restricted species. No natural habitat remaining.

Furthermore, while CI is most likely to be assessed based on data collected during the fieldwork survey, it can also be an assessment of the suitability of the receptor to support populations conforming to the fulfilling criteria. As can be seen from the worked example below, each of these evaluations of the fulfilling criteria demand necessary justification.

Functional integrity (FI) of the receptor (e.g. the vegetation/fauna community or habitat type) is defined here as the receptors' current ability to maintain the structure and functions that define it, compared to its known or predicted state under ideal conditions. Simply stated, FI is:

'A measure of the ecological condition of the impact receptor as determined by its remaining intact and functional area, its connectivity to other natural areas and the degree of current persistent ecological impacts.'

These criteria can be defined as:

- Connectivity to other natural areas – connectivity, which can also be measured conversely as the degree of habitat fragmentation, refers to how connected habitat patches are to each other, which has a significant influence on numerous ecological process, such as migration and dispersal opportunities of biota and therefore genetic exchange between populations. Connectivity to other similar habitats becomes more important as the remaining intact and functional area of a habitat decreases, mainly because population sizes decrease and are therefore at greater risk from ecological perturbations and inbreeding effects. The degree of connectivity between habitat patches varies greatly with the dispersal ability of the taxon or taxon group (e.g. fossorial reptiles) in question.
- Degree of current persistent negative ecological impacts – persistent negative impacts such as uncontrolled spread of alien and invasive flora effectively decreases both the remaining intact area and ecosystem functioning of a particular habitat.

- Remaining intact and functional area – the proportion of the receptor that supports natural habitat with intact ecological processes – small areas are less likely to withstand ecological degradation compared to large areas, and the latter are therefore better able to maintain structure and function allowing for intact ecological processes.

$$SEI = BI + RR$$

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

CI = **low**. Reason be that the vegetation and habitat has been lost. That no Species of Conservation Concern was mapped. The Northwestern corner historically was impacted by a quarry and the northern edge by cultivated lands.

- FI = **low**. Reason be that the vegetation and habitat has been lost. That no Species of Conservation Concern was mapped. The Northwestern corner historically was impacted by a quarry and the northern edge by cultivated lands.

$$BI = CI + FI$$

Therefore, using table below, the BI was assessed to be **low** (CI **low** = and FI = **low**)

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

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

Receptor resilience (RR) is defined here as:

'The intrinsic capacity of the receptor to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention.'

The fulfilling criteria to evaluate RR are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor (refer to table below) and will

require justification by the specialist. The specialist needs to bear in mind that resilience will often be linked to a particular disturbance or impact, or even time of year, and needs to be described in relation to these factors. Receptor resilience needs to be evaluated by the specialist and justification for each evaluation must be provided in the report.

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

The RR = **very high**. Reason be that the vegetation and habitat has been lost. That no Species of Conservation Concern was mapped. The Northwestern corner historically was impacted by a quarry and the northern edge by cultivated lands.

Finally, after the successful evaluation of both BI and RR as described above, it is possible to evaluate SEI from the final matrix below.

SEI should be described in the above manner for each impact receptor within the PAOI and clearly mapped in relation to the proposed development activities and infrastructure. Interpretation of SEI in the context of the proposed development activities as per table below must be provided by the specialist. It is very important to note that SEI is specific to the proposed development activities and cannot be meaningfully compared between different proposed projects with different associated activities on the same spatial location. However,

SEI for the same proposed development with multiple alternative layouts and/or locations may be compared within the same study.

$$\text{SEI (very low)} = \text{BI (low)} + \text{RR (very high)}$$

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

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

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

The Waste Disposal Facility site has a very low SEI on the PAOI.

2. APPLICABLE LEGISLATION AND PERMIT REQUIREMENTS

The proposed development within the study site is considered to elicit a requirement for possible compliance with the following legislation applicable to this assessment.

- The National Environmental Management: Biodiversity Act (Act 10 of 2004)
- The National Forest Act (Act 84 of 1998)

- Invasive species are controlled by the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) - Alien and Invasive Species (AIS) Regulations which became law on 1 October 2014

The potential applicability of the abovementioned acts to the subject site is provided below:

The National Environmental Management: Biodiversity Act (Act 10 of 2004)

This Act serves to control the disturbance and land utilisation within certain habitats, as well as the planting and control of certain exotic species. The effective disturbance and removal of species identified above, as well as possible other species (i.e. Threatened or Protected Species (TOPS) species), will require specific permission from the applicable authorities. In addition, the planting and management of exotic plant species on site, if and where required, will be governed by the Alien and Invasive Species (AIS) regulations, which were gazetted in 2014. These regulations compel landowners to manage exotic weeds on land under their jurisdiction and control. No Threatened or Protected Species were recorded that requires a permit for disturbance or removal.

The National Forest Act (Act 84 of 1998)

The National Forest Act (Act 84 of 1998) governs the removal, disturbance, cutting or damage and destruction of identified “protected trees”. No listed species were encountered or recorded on site and an application for the “clearing of a *natural forest*”, as defined within the Act, will not be required on the site in question.

Invasive species are controlled by the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) - Alien and Invasive Species (AIS) Regulations which became law on 1 October 2014.

Notably most listed alien invasive species are propagated and driven by the disturbance of land during and following construction. The planting and management of exotic plant species on site, if and where required, will be governed by the Alien and Invasive Species (AIS) regulations. Alien invasive species were recorded inside the proposed Waste Disposal Facility site.

As the recommended sites are not within a protected area the various regulations within the NEM Protected Areas Act are not applicable to this site.

3. DESCRIPTION OF PROJECT ASPECTS RELEVANT TO TERRESTRIAL BIODIVERSITY FEATURES

This terrestrial biodiversity assessment is to assess the Gwaing River Waste Disposal Facility, George impact on terrestrial biodiversity. The whole proposed site is located inside a Critical Biodiversity Areas (CBA). This CBA was incorrectly mapped as the whole site is degraded and habitat functionality that support plant species and ecological process is lost. The site is transformed as a result of previous clearing and disturbances to the topsoil and vegetation. The plant species and vegetation structure recorded during the survey does not represent dense proteoid and ericoid shrubby grassland associated with Garden Route Granite Fynbos. Proteoid and graminoid fynbos dominant with ericaceous fynbos were also not recorded in seeps or floodplain area of the Gwaing River. Although the site in the screen tool report mapped the site as mediums sensitivity, the assessment of the site has a **very low** SEI on the Project Area Of Influence (PAOI).

Geology: Mainly gneissic granite and granodiorite, as well as phyllite, schist, grit, hornfels and quartzite of the Kaaimans Group, and quartzitic sandstone of the Table Mountain Group, Cape Supergroup.

Soil Erodibility

Erodibility: Very High

Erodibility Factor: 0.74

Soil Types

Symbol: CA

Class: Soils with a strong texture contrast

Description: Soils with a marked clay accumulation, strongly structured and a non-reddish colour. In addition one or more of vertic, melanic and plinthic soils may be present

Depth: ≥ 450 mm and < 750 mm

Clay: $< 15\%$

Soil Clay & Depth

Symbol: CA

Class: Soils with a strong texture contrast

Description: Soils with a marked clay accumulation, strongly structured and a non-reddish colour. In addition one or more of vertic, melanic and plinthic soils may be present

Depth: ≥ 450 mm and < 750 mm

Clay: $< 15\%$

Source: CapeFarmMapper dated 24 November 2025.

4.4. Description of The Ecological Drivers/Processes, Functioning, Ecological Corridors that the Development Would Impede Including Migration and Movement of Flora and Fauna, and Description of any Significant Landscape Features

Conservation value and sensitivity (terms which are often used interchangeably in ecological assessments) of habitats are a product of species diversity, plant community composition, rarity of habitat, degree of habitat degradation, rarity of species, ecological viability and connectivity, vulnerability to impacts, and reversibility of threats (which in this case generally refers to the rehabilitation potential of the habitat; high sensitivity habitats having low rehabilitation potential). According to Dayaram et al., (2018) the vegetation of study area used to consist of Garden Route Granite Fynbos, with a critically endangered ecosystem status. Cape Lowland Alluvial Vegetation with an endangered ecosystem status associated with the Gwaing River was also mapped outside the proposed site. The edge effects from the Waste Disposal Facility site operations will affect these mapped vegetation types and its ecology, but the impacts, mitigation measures and management actions will be applicable to the Aquatic Biodiversity Assessment.

The whole proposed site is located inside a Critical Biodiversity Areas (CBA). This CBA was incorrectly mapped as the whole site is degraded and habitat functionality that support plant species and ecological process is lost.

CBA

Name: Garden Route Granite Fynbos

Condition: Natural

Category 1: CBA: Terrestrial

Category 2: CBA: Threatened Ecosystem

Definition: Areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure.

Objective: Maintain in a natural or near-natural state, with no further loss of natural habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land uses are appropriate.

FFg 5 Drews (1980b), Hoare et al. (2000) Garden Route Granite Fynbos.

Vegetation & Landscape Features Moderately undulating plains and undulating hills on the coastal forelands. Dense proteoid and ericoid shrubby grassland. Proteoid and graminoid fynbos are dominant with ericaceous fynbos in seeps. In the west, most remnants of this type are dominated by proteas. Eastwards graminoid and ericaceous fynbos are dominant on the flat plateaus, with proteas confined to the steep slopes.

Important Taxa Tall Shrubs: *Passerina corymbosa* (d), *Cliffortia serpyllifolia*, *Protea coronata*, *P. lanceolata*, *P. nerifolia*. Low Shrubs: *Erica discolor* variant '*speciosa*' (d), *E. peltata* (d), *Phyllica confusa* (d), *Syncarpha paniculata* (d), *Agathosma ovata*, *Anthospermum prostratum*, *Aspalathus asparagoides*, *Cliffortia falcata*, *Cullumia bisulca*, *Erica canaliculata*, *E. diaphana*, *E. formosa*, *Eriocephalus africanus*, *Hermannia angularis*, *Leucadendron salignum*, *Lobelia tomentosa*, *Metalasia pungens*, *Mimetes cucullatus*, *Pelargonium fruticosum*, *Relhania calycina*. Succulent Shrub: *Lampranthus sociorum*. Semiparasitic Shrubs: *Osyris compressa*, *Thesium virgatum*. Semiparasitic Epiphytic Shrub: *Viscum capense*. Geophytic Herb: *Schizaea pectinata*. Graminoids: *Tetraria cuspidata* (d), *Brachiaria serrata*, *Eragrostis capensis*, *Ficinia nigrescens*, *Heteropogon contortus*, *Pentaschistis eriostoma*, *Restio triticeus*, *Themeda triandra*.

The site is transformed as a result of previous clearing and disturbances to the topsoil and vegetation. The plant species and vegetation structure recorded during the survey does not represent dense proteoid and ericoid shrubby grassland associated with Garden Route Granite Fynbos. Proteoid and graminoid fynbos dominant with ericaceous fynbos were also not recorded in seeps or floodplain area of the Gwaing River.

The plants recorded during the survey were *Rumex crispus*, *Erica canaliculate* (one plant), *Lobelia coronopifolia*, *Senecio erosus*, *Arctotheca calendula*, *Helichrysum petiolare*, *Passerina corymbosa* (one plant), *Pentaschistis eriostoma*, *Acacia mearnsii*, *Eucalyptus* sp, *Cirsium vulgare*, *Solanum mauretanum* and *Stenotaphrum secundatum*.

The transformed nature of the site resulted in the area being mapped having very low sensitivity in terms of plant species. This confirms the site visit results and the transformed state of the area. No Threatened or Protected Species were recorded on site and unlikely that they will occur on site due to the transformed state of the area.

4.5. Description of the Terrestrial Biodiversity and Ecosystems

4.5.1. Main Vegetation Types

According to *The Vegetation Map of South African, Lesotho and Swaziland* (VEGMAP), (Dayaram et al., 2018) the vegetation of study area used to consist of Garden Route Granite Fynbos, with a critically endangered ecosystem status. Cape Lowland Alluvial Vegetation with an endangered ecosystem status associated with the Gwaing River was also mapped. The edge effects from the Waste Disposal Facility site operations will affect these mapped

vegetation types and its ecology, but the impacts, mitigation measures and management actions will be applicable to the Aquatic Biodiversity Assessment.

4.5.2. Threatened Ecosystems, Including Listed Ecosystems

According to *The Vegetation Map of South African, Lesotho and Swaziland* (VEGMAP), (Dayaram *et al.*, 2018) the vegetation of study area used to consist of Garden Route Granite Fynbos, with a critically endangered ecosystem status. Cape Lowland Alluvial Vegetation with an endangered ecosystem status associated with the Gwaing River was also mapped. The edge effects from the Waste Disposal Facility site operations will affect these mapped vegetation types and its ecology, but the impacts, mitigation measures and management actions will be applicable to the Aquatic Biodiversity Assessment.

4.5.3. Ecological Connectivity, Habitat Fragmentation, Ecological Processes and Fine-Scale Habitats

The site is close to the edge of natural veld associated with the Gwaing River and its mapped tributary. As a result of this it is, however, ecological connected.

4.5.4. Species, Distribution, Important Habitats

None of the species listed in Environmental Screen tool report were recorded on site and not likely to occur on site). The plants recorded during the survey were *Rumex crispus*, *Erica canaliculate* (one plant), *Lobelia coronopifolia*, *Senecio erosus*, *Arctotheca calendula*, *Helichrysum petiolare*, *Passerina corymbosa* (one plant), *Pentaschistis eriostoma*, *Acacia mearnsii*, *Eucalyptus sp*, *Cirsium vulgare*, *Solanum mauretanum* and *Stenotaphrum secundatum*.

None of the animal species listed in the screen tool report was mapped during the survey and the proposed expansion of the landfill site on this area will not vegetatively impact on any animal and plant species. Animal Species of Conservation Concern known to occur in the area habitat is not present on site.

4.6. Terrestrial Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs)

The whole proposed site is located inside a Critical Biodiversity Areas (CBA). This CBA was incorrectly mapped as the whole site is degraded and habitat functionality that support plant species and ecological process is lost.

CBA

Name: Garden Route Granite Fynbos

Condition: Natural

Category 1: CBA: Terrestrial

Category 2: CBA: Threatened Ecosystem

Definition: Areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure.

Objective: Maintain in a natural or near-natural state, with no further loss of natural habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land uses are appropriate.

4.7. Protected Areas and Priority Areas for Protected Area Expansion

No protected area or priority areas for protected area expansion are inside or close to the study area.

4.8. Strategic Water Source Areas (SWSA)

None recorded.

4.9. Freshwater Ecosystem Priority Area (FEPA) and Freshwater Ecological features

The Gwaing River area west of the Waste Disposal Facility site was mapped NFEPA area.

4.10. Indigenous Forests

No indigenous forests are inside or close to the study area.

5. SITE ECOLOGICAL IMPORTANCE ASSESSMENT

The Site Ecological Importance is very low.

6. IMPACT ASSESSMENT

6.1. Assessment & Significance Criteria

The assessment criteria used in the assessment are drawn from the protocol for the specialist assessment and minimum report content requirements for environmental impacts (published in Government Notice **no. 320** in Government Gazette **43110** 20 March 2020) were used.

6.2. Assessment of Potential Impacts

The impacts identified are assessed below, before and after mitigation as well as during construction.

The impact assessment which follows is based on the site sensitivity and any deviations from the site sensitivity map as provided may invalidate the results of the assessment.

6.3. Risk Assessment Criteria

Step 1: Determine the **PROBABILITY** of the impact by calculating the average between the Frequency of the Aspect, the Availability of a pathway to the receptor and the availability of the receptor (thus: Sum of the three column scores below ÷ 3)

Frequency of Aspect / Unwanted Event	Score	Availability of pathway from the source to the receptor	Score	Availability of receptor	Score
Never known to have happened, but may happen	1	A pathway to allow for the impact to occur is never available	1	The receptor is never available	1
Known to happen in industry	2	A pathway to allow for the impact to occur is almost never available	2	The receptor is almost never available	2
< once a year	3	A pathway to allow for the impact to occur is sometimes available	3	The receptor is sometimes available	3
Once per year to up to once per month	4	A pathway to allow for the impact to occur is almost always available	4	The receptor is almost always available	4
Once a month - Continuous	5	A pathway to allow for the impact to occur is always available	5	The receptor is always available	5

Step 2: Determine the **MAGNITUDE** of the impact by calculating the average of the factors below (thus: Sum of all six column ratings below ÷ 6)

Source						Receptor					
Duration of impact	Score	Extent	Score	Volume / Quantity / Intensity	Score	Toxicity / Destruction Effect	Score	Reversibility	Score	Sensitivity of environmental component	Score
Lasting days to a month	1	Effect limited to the site. (metres);	1	Very small quantities / volumes / intensity (e.g. < 50L or < 1Ha)	1	Nontoxic (e.g. water) / Very low potential to create damage or destruction to the environment	1	Bio-physical and/or social functions and/or processes will remain unaltered.	1	Current environmental component(s) are largely disturbed from the natural state. Receptor of low significance / sensitivity	1
Lasting 1 month to 1 year	2	Effect limited to the activity and its immediate surroundings. (tens of metres)	2	Small quantities / volumes / intensity (e.g. 50L to 210L or 1Ha to 5Ha)	2	Slightly toxic / Harmful (e.g. diluted brine) / Low potential to create damage or destruction to the environment	2	Bio-physical and/or social functions and/or processes might be negligibly altered or enhanced / Still reversible	2	Current environmental component(s) are moderately disturbed from the natural state. No environmentally sensitive components.	2
Lasting 1 – 5 years	3	Impacts on extended area beyond site boundary (hundreds of metres)	3	Moderate quantities / volumes / intensity (e.g. > 210 L < 5000L or 5 – 8Ha)	3	Moderately toxic (e.g. slimes) Potential to create damage or destruction to the environment	3	Bio-physical and/or social functions and/or processes might be notably altered or enhanced / Partially reversible	3	Current environmental component(s) are a mix of disturbed and undisturbed areas. Area with some environmental sensitivity (scarce / valuable environment etc.).	3
Lasting 5 years to Life of Organisation	4	Impact on local scale / adjacent sites (km's)	4	Very large quantities / volumes / intensity (e.g. 5000 L – 10 000L or 8Ha– 12Ha)	4	Toxic (e.g. diesel & Sodium Hydroxide)	4	Bio-physical and/or social functions and/or processes might be considerably altered or enhanced / potentially irreversible	4	Current environmental component(s) are in a natural state. Environmentally sensitive environment / receptor (endangered species / habitats etc.).	4

Source								Receptor			
Duration of impact	Score	Extent	Score	Volume / Quantity / Intensity	Score	Toxicity / Destruction Effect	Score	Reversibility	Score	Sensitivity of environmental component	Score
Beyond life of Organization / Permanent impacts	5	Extends widely (nationally or globally)	5	Very large quantities / volumes / intensity (e.g. > 10 000 L or > 12Ha)	5	Highly toxic (e.g. arsenic or TCE)	5	Bio-physical and/or social functions and/or processes might be severely/substantially altered or enhanced / Irreversible	5	Current environmental component(s) are in a pristine natural state. Highly Sensitive area (endangered species, wetlands, protected habitats etc.)	5

Step 3: Determine the **SEVERITY** of the impact by plotting the averages that were obtained above for Probability and Magnitude in the table below.

ENVIRONMENTAL IMPACT RATING / PRIORITY					
	MAGNITUDE				
PROBABILITY	1 Minor	2 Low	3 Medium	4 High	5 Major
5 Almost Certain	Low	Medium	High	High	High
4 Likely	Low	Medium	High	High	High
3 Possible	Low	Medium	Medium	High	High
2 Unlikely	Low	Low	Medium	Medium	High
1 Rare	Low	Low	Low	Medium	Medium

TERRESTRIAL BIODIVERSITY IMPACTS

Preferred Alternative included in the section 24G Application. Impact assessment considering the consequences on expansion of landfill site.	Degradation / loss of naturally occurring / indigenous flora and habitats
Potential impact and risk:	Loss of Terrestrial Biodiversity and ecological functioning
Nature of impact:	Discussion: Garden Route Granite Fynbos, with a critically endangered ecosystem status on the proposed expansion footprint was mapped. Cape Lowland Alluvial Vegetation with an endangered ecosystem status on the western edge associated with the Gwaing River was also mapped outside the proposed site. The edge effects from the Waste Disposal Facility site operations will affect these mapped vegetation types and its ecology, but the impacts, mitigation measures and management actions will be applicable to the Aquatic Biodiversity Assessment.
Extent and duration of impact:	Extent 2 & Duration 5
Consequence of impact or risk:	Activities can disturb and impact on surrounding terrestrial biodiversity features.
Magnitude	3
Probability of occurrence:	5
Degree to which the impact may cause irreplaceable loss of resources:	Resource will be partly destroyed (PR)
Degree to which the impact can be reversed:	Not reversible
Indirect impacts:	Disturbance to surface area can result in erosion and dust generation which may affect surrounding terrestrial biodiversity features.
Cumulative impact prior to mitigation:	Loss of significantly impacted upon vegetation and habitat.
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium
Degree to which the impact can be avoided:	High
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	High
Proposed mitigation:	Areas outside the Waste Disposal Facility as identified must be avoided and protected at all times.

	Continuously appropriately rehabilitated with fresh topsoil and erosion control measures as the rehabilitation progress, monitored, and properly managed afterwards is required. Invasive vegetation to be removed during rehabilitation in such a manner that seeds must not be able to spread from the disposal site or during transportation.
Residual impacts:	Seepage and waste impacts on surrounding areas.
Cumulative impact post mitigation:	Seepage and waste impacts on surrounding areas.
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low
OPERATIONAL PHASE	
Potential impact and risk:	Loss of Terrestrial Biodiversity and ecological functioning
Nature of impact:	Discussion: The whole proposed site is located inside a Critical Biodiversity Areas (CBA). This CBA was incorrectly mapped as the whole site is degraded and habitat functionality that support plant species and ecological process is lost.
Extent and duration of impact:	Extent 2 & Duration 5
Consequence of impact or risk:	Activities can disturb and impact on surrounding terrestrial biodiversity features.
Magnitude	3
Probability of occurrence:	5
Degree to which the impact may cause irreplaceable loss of resources:	Resource will be partly destroyed (PR)
Degree to which the impact can be reversed:	Not reversible
Indirect impacts:	Disturbance to surface area can result in erosion and dust generation which may affect surrounding terrestrial biodiversity features.
Cumulative impact prior to mitigation:	Loss of significantly impacted upon vegetation and habitat.
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium
Degree to which the impact can be avoided:	High
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	High
Proposed mitigation:	Areas outside the Waste Disposal Facility as identified must be avoided and protected at all times.

	Continuously appropriately rehabilitated with fresh topsoil and erosion control measures as the rehabilitation progress, monitored, and properly managed afterwards is required. Invasive vegetation to be removed during rehabilitation in such a manner that seeds must not be able to spread from the disposal site or during transportation.
Residual impacts:	Seepage and waste impacts on surrounding areas.
Cumulative impact post mitigation:	Seepage and waste impacts on surrounding areas.
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low

Impact assessment considering the consequences on unlawful commencement which is the unlawfully extended area with a portion of the waste body = 22 400m²	Degradation / loss of naturally occurring / indigenous flora and habitats
Potential impact and risk:	Loss of Terrestrial Biodiversity and ecological functioning
Nature of impact:	Discussion: Garden Route Granite Fynbos, with a critically endangered ecosystem status which is outside on the northern edge of the Waste Disposal Facility site footprint and associated with the non-perennial tributary of the Gwaingrivier was mapped. Cape Lowland Alluvial Vegetation with an endangered ecosystem status on the western edge outside the Waste Disposal Facility site and associated with the Gwaingrivier was also mapped. The edge effects from the Waste Disposal Facility site operations will affect these mapped vegetation types and its ecology, but the impacts, mitigation measures and management actions will be applicable to the Aquatic Biodiversity Assessment.
Extent and duration of impact:	Extent 2 & Duration 5
Consequence of impact or risk:	Activities can disturb and impact on surrounding terrestrial biodiversity features.
Magnitude	Medium
Probability of occurrence:	High
Degree to which the impact may cause irreplaceable loss of resources:	Resource will be partly destroyed (PR)
Degree to which the impact can be reversed:	Not reversible

Indirect impacts:	Disturbance to surface area can result in erosion and dust generation which may affect surrounding terrestrial biodiversity features.
Cumulative impact prior to mitigation:	Loss of significantly impacted upon vegetation and habitat.
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium
Degree to which the impact can be avoided:	High
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	High
Proposed mitigation:	Areas outside the Waste Disposal Facility as identified must be avoided and protected at all times. Continuously appropriately rehabilitated with fresh topsoil and erosion control measures as the rehabilitation progress, monitored, and properly managed afterwards is required. Invasive vegetation to be removed during rehabilitation in such a manner that seeds must not be able to spread from the disposal site or during transportation.
Residual impacts:	Seepage and waste impacts on surrounding areas.
Cumulative impact post mitigation:	Seepage and waste impacts on surrounding areas.
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low
OPERATIONAL PHASE	
Potential impact and risk:	Loss of Terrestrial Biodiversity and ecological functioning
Nature of impact:	Discussion: Garden Route Granite Fynbos, with a critically endangered ecosystem status which is outside on the northern edge of the Waste Disposal Facility site footprint and associated with the non-perennial tributary of the Gwaingrivier was mapped. Cape Lowland Alluvial Vegetation with an endangered ecosystem status on the western edge outside the Waste Disposal Facility site and associated with the Gwaingrivier was also mapped. The edge effects from the Waste Disposal Facility site operations will affect these mapped vegetation types and its ecology, but the impacts, mitigation measures and management actions will be

	applicable to the Aquatic Biodiversity Assessment.
Extent and duration of impact:	Extent 2 & Duration 5
Consequence of impact or risk:	Activities can disturb and impact on surrounding terrestrial biodiversity features.
Magnitude	Medium
Probability of occurrence:	High
Degree to which the impact may cause irreplaceable loss of resources:	Resource will be partly destroyed (PR)
Degree to which the impact can be reversed:	Not reversible
Indirect impacts:	Disturbance to surface area can result in erosion and dust generation which may affect surrounding terrestrial biodiversity features.
Cumulative impact prior to mitigation:	Loss of significantly impacted upon vegetation and habitat.
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium
Degree to which the impact can be avoided:	High
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	High
Proposed mitigation:	Areas outside the Waste Disposal Facility as identified must be avoided and protected at all times. Continuously appropriately rehabilitated with fresh topsoil and erosion control measures as the rehabilitation progress, monitored, and properly managed afterwards is required. Invasive vegetation to be removed during rehabilitation in such a manner that seeds must not be able to spread from the disposal site or during transportation.
Residual impacts:	Seepage and waste impacts on surrounding areas.
Cumulative impact post mitigation:	Seepage and waste impacts on surrounding areas.
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low

NO GO ASSESSMENT

The unlawfully extended area with a portion of the waste body = 22 400m² and the proposed expansion / offset area = 69 200m²	Degradation / loss of naturally occurring / indigenous flora and habitats
Potential impact and risk:	Loss of Terrestrial Biodiversity and ecological functioning

Nature of impact:	Discussion: Garden Route Granite Fynbos, with a critically endangered ecosystem status which is outside on the northern edge of the Waste Disposal Facility site footprint and associated with the non-perennial tributary of the Gwaingrivier was mapped. Cape Lowland Alluvial Vegetation with an endangered ecosystem status on the western edge outside the Waste Disposal Facility site and associated with the Gwaingrivier was also mapped. The edge effects from the Waste Disposal Facility site operations will affect these mapped vegetation types and its ecology, but the impacts, mitigation measures and management actions will be applicable to the Aquatic Biodiversity Assessment.
Extent and duration of impact:	Extent 2 & Duration 5
Consequence of impact or risk:	Activities can disturb and impact on surrounding terrestrial biodiversity features.
Magnitude	Medium
Probability of occurrence:	High
Degree to which the impact may cause irreplaceable loss of resources:	Resource will be partly destroyed (PR)
Degree to which the impact can be reversed:	Not reversible
Indirect impacts:	Disturbance to surface area can result in erosion and dust generation which may affect surrounding terrestrial biodiversity features.
Cumulative impact prior to mitigation:	Loss of significantly impacted upon vegetation and habitat.
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium
Degree to which the impact can be avoided:	High
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	High
Proposed mitigation:	Areas outside the Waste Disposal Facility as identified must be avoided and protected at all times. Continuously appropriately rehabilitated with fresh topsoil and erosion control measures as the rehabilitation progress, monitored, and properly managed afterwards is required. Invasive vegetation to be removed during rehabilitation in such a manner that seeds must not

	be able to spread from the disposal site or during transportation.
Residual impacts:	Seepage and waste impacts on surrounding areas.
Cumulative impact post mitigation:	Seepage and waste impacts on surrounding areas.
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low
OPERATIONAL PHASE	
Potential impact and risk:	Loss of Terrestrial Biodiversity and ecological functioning
Nature of impact:	Discussion: Garden Route Granite Fynbos, with a critically endangered ecosystem status which is outside on the northern edge of the Waste Disposal Facility site footprint and associated with the non-perennial tributary of the Gwaingrivier was mapped. Cape Lowland Alluvial Vegetation with an endangered ecosystem status on the western edge outside the Waste Disposal Facility site and associated with the Gwaingrivier was also mapped. The edge effects from the Waste Disposal Facility site operations will affect these mapped vegetation types and its ecology, but the impacts, mitigation measures and management actions will be applicable to the Aquatic Biodiversity Assessment.
Extent and duration of impact:	Extent 2 & Duration 5
Consequence of impact or risk:	Activities can disturb and impact on surrounding terrestrial biodiversity features.
Magnitude	Medium
Probability of occurrence:	High
Degree to which the impact may cause irreplaceable loss of resources:	Resource will be partly destroyed (PR)
Degree to which the impact can be reversed:	Not reversible
Indirect impacts:	Disturbance to surface area can result in erosion and dust generation which may affect surrounding terrestrial biodiversity features.
Cumulative impact prior to mitigation:	Loss of significantly impacted upon vegetation and habitat.
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium
Degree to which the impact can be avoided:	High

Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	High
Proposed mitigation:	Areas outside the Waste Disposal Facility as identified must be avoided and protected at all times. Continuously appropriately rehabilitated with fresh topsoil and erosion control measures as the rehabilitation progress, monitored, and properly managed afterwards is required. Invasive vegetation to be removed during rehabilitation in such a manner that seeds must not be able to spread from the disposal site or during transportation.
Residual impacts:	Seepage and waste impacts on surrounding areas.
Cumulative impact post mitigation:	Seepage and waste impacts on surrounding areas.
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low

Cumulative Impacts

Cumulative impacts arise from the combined presence of several similar activities within an area which affect terrestrial biodiversity and ecological processes operating at broader scales or which each have a small impact which becomes significant when combined. The disturbed areas continuously appropriately rehabilitated with fresh topsoil and erosion control measures as the rehabilitation progresses, monitored, and properly managed afterwards.

7. CONCLUSION AND RECOMMENDATIONS

The impact assessment considering the consequences on the preferred alternative included in the section 24G Application.

This terrestrial biodiversity assessment assessed the Gwaing River Waste Disposal Facility, George impact on terrestrial biodiversity. The whole proposed site is located inside a CBA. This CBA was incorrectly mapped as the whole site is degraded and habitat functionality that support plant species and ecological process is lost. The site is transformed as a result of previous clearing and disturbances to the topsoil and vegetation. The plant species and vegetation structure recorded during the survey does not represent dense proteoid and ericoid shrubby grassland associated with Garden Route Granite Fynbos. Proteoid and graminoid fynbos dominant with ericaceous fynbos were also not recorded in seeps or floodplain area of the Gwaing River. Although the site in the screen tool report mapped the site as medium sensitivity, the assessment of the site has a **very low** SEI on the Project Area Of Influence (PAOI).

The site is transformed as a result of previous clearing and disturbances to the topsoil and vegetation. The plant species and vegetation structure recorded during the survey does not represent dense proteoid and ericoid shrubby grassland associated with Garden Route Granite Fynbos. Proteoid and graminoid fynbos dominant with ericaceous fynbos were also not

recorded in seeps or floodplain area of the Gwaing River. No Threatened or Protected Species were recorded on site and unlikely that they will occur on site due to the transformed state of the area. None of the animal species listed in the screen tool report was mapped during the survey and the proposed expansion of the landfill site on this area will not vegetatively impact on any animal and plant species. Animal Species of Conservation Concern known to occur in the area habitat is not present on site.

The following management and mitigation measures must be included in the EMPr:

- Areas outside the Waste Disposal Facility as identified must be avoided and protected at all times.
- Continuously appropriately rehabilitated with fresh topsoil and erosion control measures as the rehabilitation progress, monitored, and properly managed afterwards is required.
- Invasive vegetation to be removed during rehabilitation in such a manner that seeds must not be able to spread from the disposal site or during transportation.

Provided that activities are restricted to the property and the mitigation measures and continual rehabilitation and monitoring to reduce the impacts of the activities are implemented, then the activities are not likely to result in long-term degradation of the receiving environment or significant net loss of terrestrial biodiversity.

The impact assessment considering the consequences on unlawful commencement.

The sampling and analysis of the site during the optimum season, provides suitable data and results to present an informed decision on the local ecology and terrestrial biodiversity features. The lists of species for the site are based on those observed at the site as well as those likely to occur in the area based on their distribution and habitat preferences. This represents a sufficiently conservative and cautious approach. During the site visit, the different biodiversity features, habitat, vegetation and landscape units present were identified and recorded in the field. Walk-through-surveys were conducted of representative habitats and areas of interest and species observed were recorded. Searches for listed species of conservation concern at the site were conducted, but none were observed which required the recording of their location. Active searches for reptiles and amphibians were also conducted within habitats likely to harbour or be important for such species present on site. The presence of sensitive habitats such as wetlands or pans and unique edaphic environments on site, such as rocky outcrops or quartz patches, are not present and therefore was not recorded and mapped.

The study recorded very low sensitivity areas within the Waste Disposal Facility area.

No additional survey or further assessment is in the authors view recommended.

Provided that activities are restricted to the property and the mitigation measures and continual rehabilitation and monitoring to reduce the impacts of the activities are implemented, then the activities are not likely to result in long-term degradation of the receiving environment or significant net loss of terrestrial biodiversity.

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APPENDIX A SPECIALIST CV

CURRICULUM VITAE – NICOLAAS WILLEM HANEKOM

Profession: Environmental Scientist and Environmental Assessment Practitioner

Date of Birth: 01/02/1967

BIOGRAPHICAL SKETCH

Nicolaas Hanekom is a qualified Environmental Assessment Practitioner ("EAP") who holds a Masters Technologiae, Nature Conservation ("Vegetation Ecology and Biodiversity Assessment") degree from the Cape Peninsula University of Technology. Nicolaas is certified in terms of section 20(3)(a) of the Natural Scientific Professions Act, 2003 (Act 27 of 2003), as a Professional Natural Scientist Ecological Science (Pri.Sci.Nat); Aquatic Science, Zoological & Conservation Science (Cand.Sci.Nat), Registration Number: 004415. He further qualified in Environmental Management Systems ISO 14001:2004, at the Centre for Environmental Management, North-West University, as well as Environmental Management Systems ISO 14001:2004 Audit: Internal Auditors Course to ISO 19011:2003 level, from the Centre for

Environmental Management, North-West University qualifying him to execute audits to ISO/SANS environmental compliance and EMS standards.

He has also completed the suite of Greener Governance courses with certificates in;

- An Overview of Environmental Management at the Local Government Level, Centre for Environmental Management, North-West University;
- Greener Governance for Local Authorities, Centre for Environmental Management, North-West University;
- Tools for Integrated Environmental Management and Governance, Centre for Environmental Management, North-West University.

He further attended and obtained a certificate on Integrated Protected Area Planning at the Centre for Environmental Development, University of Kwa Zulu Natal and a certificate in Project Management (Theory and Practical), through CS Holdings. Nicolaas has lectured in two subjects at the Cape Peninsula University of Technology. He has 26 years of environmental planning experience, working for Free State and Western Cape departments of environmental affairs, where he reviewed and commented on development (EIA) applications, in the West Coast Region.

He has, as practising EAP been responsible for many environmental impact assessments and EIA applications, waste license and atmospheric emission license applications.

He has also been involved in the implementation of several environmental management systems. He has engaged successfully with various clients as set out below.

Areas of specialisation:	• Ecosystem (terrestrial and aquatic) monitoring and assessments • Design of monitoring programmes for ecosystems (terrestrial and aquatic) • Environmental Impact Assessments • River classification and environmental water requirements • Wetlands Delineation • River and Wetlands management • Water Use Authorization Applications • Water quality management • River Health Assessments
Countries of Work Experience:	South Africa (Northern Cape, Western Cape, Free State, Mpumalanga, Gauteng)
Employment Record	• Student at Bontebok National Park (1992) • Assistant Reserve Manager at Gariep Dam Nature Reserve, Free State (1993 - 1998) • Reserve Manager, Conservation Services Manager for Western Cape Nature Conservation Board (1998 - 2006)

	• External Lecturer at Cape Peninsula University of Technology (2003 - 2005) • Director: Environmental Management at Cape Lowlands Environmental Services (2006 – 2010) • Director, Environmental Management and lead Environmental Impact Assessment Practitioner at Eco Impact (Pty) Ltd (2010 – to August 2019) • Director, Environmental Management and lead Environmental Impact Assessment Practitioner at Enviro-EAP (Pty) Ltd (September 2019 – to date)
Professional membership, accreditations and courses	• South African Council for Natural Scientists Professions Pri.Sci.Nat (Ecological Science) • Riparian vegetation identification and health assessment. Internal Western Cape Nature Conservation short course presented by Dr C Boucher (Stellenbosch University) in 2000. • SASS5 Aquatic Biomonitoring Training Course. 2 to 5 September 2013. Ground Truth Water and Environmental Engineering consultancy in partnership with the Department of Water Affairs. • Workshop on “Section 21(c) and (i) Water Use Training: Understanding Watercourses and Managing Impacts to their Characteristics”. 10 May 2017. Presented by Dr Wietsche Roets of the Department of Water and Sanitation (Sub-Directorate: Instream Water Use).
Summary of experience	1992: South African National Parks. Student at Bontebok National Park with management and monitoring actions related to the Breede River. 1993 -1998: Free State Nature Conservation. Ecological management and monitoring actions related to the Gariep Dam, Orange and Caledon Rivers. 1998 -2006: CapeNature. Ecological management and monitoring actions related to the Berg River Estuary, Verlorenvlei, Lamberts bay's Jackalsvlei, Wadriht Soutpanne, Oliphant's River mouth, Rocherpan Nature Reserve, etc. Review and assessment of EIA applications, inclusive of Freshwater ecology. Did some site visits with Department of Water Affairs and Forestry (Hester Lyons) to confirm the presence of aquatic ecological features during EIA water use registration applications. 2006 to date: Cape Lowland Environmental Services, Eco Impact Legal Consultant and Enviro-EAP. Ecological (Freshwater and aquatic) Specialist input, assessment, monitoring and reports.
Publications and assessment reports	Just to name a few. Was involved in many Ecological Assessments, monitoring and inputs in EIA applications. • Elandskloof Farm 475 Citrusdal Biodiversity Baseline Survey. August 2010. This Biodiversity Assessment Covering Terrestrial and Aquatic Aspects to Inform Decisions Regarding The

	Proposed Elandskloof Weir Flood Damage Project On Farm 475, In The Citrusdal Area. • Cape Solar Energy Electricity Generation Facility. Farm 187/3 & 187/13 Kenhardt. Biodiversity And Ecological Baseline Survey. January 2011. (Included Terrestrial and aquatic ecological assessments and water use authorization applications) • Prieska Photovoltaic Power Generation Project. Prieska Commonage Northern Cape. Biodiversity And Ecological Baseline Survey. July 2011. (Included Terrestrial and aquatic ecological assessments and water use authorization applications) • Witteklip Erf 123 Extension, Vredenburg. Biodiversity Baseline Survey. Updated - October 2012 (Included Terrestrial and aquatic ecological assessments and water use authorization applications) • Baseline Biodiversity Survey And Wetland Delineation for ECCA Holdings: Cape Bentonite Mine on Erf 1412 Near Heidelberg. Prepared for: Shangoni Management Services Pry (Ltd). October 2014. • Freshwater Impact Assessment Laingsburg Flood Damage Repairs & Storm Water Infrastructure. 18 February 2016. • Ecological Assessment for Swartland Municipality - Upgrades To Voortrekker/Bokomo Road And Voortrekker/Rozenburg Road Intersections and Upgrade to the Diep River Bridge, Malmesbury on A Portion Of Erf 327, Malmesbury (Road) Erf 1530, Diep River Bridge Crossing, and Erf 1528, Property South of Diep River where Road Widening and Turning Circle Will Be Constructed. March 2016. (Freshwater Ecology Inputs and Water Use Registration) • Freshwater Impact Assessment. McGregor Bridge, Robertson Bridge and Willem Nels River Maintenance Management Plan. 24 June 2016. (Freshwater Ecology assessment and input as well as Water Use Registration) • Water Use Authorization Application Risk Matrix. Orange Grove Trust Vegetation Clearing and Agricultural Development on Portion 4 of Farm Glen Heatlie No 316, Worcester. 12 June 2017. (Freshwater ecological inputs in EIA process and Water Use Registration). • Water Use Authorization Application Risk Matrix Prepared For: Witzenberg Municipality Sand Mine Farm 1 Prince Alfred Hamlet. 28 March 2017. (Freshwater ecological inputs in EIA process and Water Use Registration). • Proposed Hartmanshoop Agri Vegetation Clearing Project and Irrigation on Erf 686, Laingsburg. 12 August 2017. (Freshwater ecological inputs in Water Use Registration).
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	County Fair: Hocraft Abattoir And Rendering Facility Waste Water Treatment Works “CF Hocraft WWTW” Mosselbank River Second Quarter 2018 Biomonitoring Report. June 2018. (Done quarterly biomonitoring for the last three years).
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CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, these data correctly describe my qualifications, my experience, and me.

Nicolaas Hanekom Pri Sci Nat (Ecology).
Registration number 004415