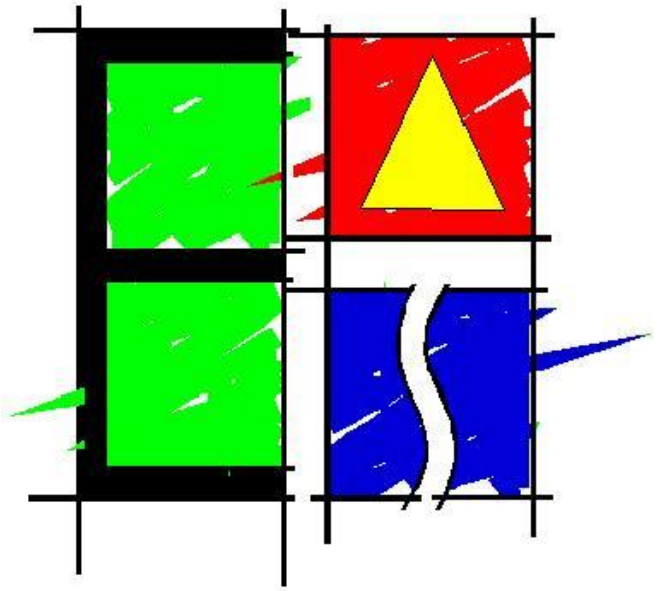
Kranshoek - Ecological Assessment Report



Report Prepared by:
Engineering Advice & Services (Pty) Ltd

EAS Project Number: 1626

8 February 2019

Kranshoek - Ecological Assessment Report

For:

Sharples Environmental Services cc

By: Engineering Advice & Services (Pty) Ltd.

73 Heugh Road, Walmer
Port Elizabeth, 6013
Tel: +27 (0) 41 581 2421
Fax: +27 (0) 86 683 9899

EAS Project Number: 1626

8 February 2019

Compiled by:

Name	Company	Email
Mr Jamie Pote	Engineering Advice & Services	jamiep@easpe.co.za
Mr Kurt Wicht	Engineering Advice & Services	kurtw@easpe.co.za

EAS Ref: F:\1600-1699\1626\Environmental\Reports\Biophysical Reports\1626 - Kranshoek Ecological Assessment Report 20112018 KW.docx

Table of Contents

List of Figures

List of Tables

Abbreviations

CARA	Conservation of Agricultural Resources Act 43 of 1983
CBA	Critical Biodiversity Area
DEA	Department of Environmental Affairs
DWAS	Department of Water Affairs and Sanitation
DWAF	Department of Water Affairs and Forestry (former department name)
EA	Environmental Authorisation
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMC	Ecological Management Class
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
IAP's	Interested and Affected Parties
IEM	Integrated Environmental Management
LHS	Left Hand Side
LM	Local Municipality
masl	meters above sea level
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act 107 of 1998
NEMBA	National Environmental Management: Biodiversity Act 10 of 2004
NFA	National Forest Act 84 of 1998
PEMC	Present Ecological Management Class
PES	Present Ecological State
RDL	Red Data List
RHS	Right Hand Side
RoD	Record of Decision
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
SCC	Species of Conservation Concern
ToPS	Threatened or Protected Species
ToR	Terms of Reference
+ve	Positive
-ve	Negative

Glossary

- **Annual:** Completing the cycle from seed to death in one year or season.
- **Arboreal:** Living in trees
- **Biennial:** Completing the cycle from seed to death in two years or seasons.
- **Boundary:** Landscape patches have a boundary between them which can be defined or fuzzy (Sanderson and Harris 2000). The zone composed of the edges of adjacent ecosystems is the boundary.
- **Composition:** refers to the number of patch types (see below) represented on a landscape, and their relative abundance.
- **Connectivity:** relates to how intact patches of indigenous vegetation are (i.e. it is the opposite of fragmentation). "Functional" connectivity refers to the ability of connective corridors to sustain ecosystem processes common to linked patches. The measure of how connected or spatially continuous a corridor, network, or matrix is. For example, a forested landscape (the matrix) with fewer gaps in forest cover (open patches) will have higher connectivity.
- **Corridors:** have important functions as strips of a particular type of landscape differing from adjacent land on both sides. habitat, ecosystems or undeveloped areas that physically connect habitat patches. Smaller, intervening patches of surviving habitat can also serve as "stepping stones" that link fragmented ecosystems by ensuring that certain ecological processes are maintained within and between groups of habitat fragments.
    - Key considerations when identifying ecological corridors that can contribute to the conservation of biodiversity:
    - support connections between remaining natural habitat
    - support connections between critically endangered or endangered vegetation and large, intact areas of natural vegetation
    - include a diverse array of natural habitats, including wetlands
    - include significant ecological processes that contribute to the regional persistence of biodiversity
    - Due consideration of certain of these processes (such as the maintenance of natural fire regimes) should also be incorporated into good land use management practices for the remaining natural vegetation and immediate surrounding areas.
- **Critically Endangered** critically endangered terrestrial ecosystems have lost so much of their original natural habitat (more than 80 % lost) that ecosystem functioning has to a large extent broken down and a significant proportion of species associated with the ecosystem have been lost or are likely to be lost.
- **Disturbance:** an event that significantly alters the pattern of variation in the structure or function of a system, while fragmentation is the breaking up of a habitat, ecosystem, or land-use type into smaller parcels. Disturbance is generally considered a natural process.
- **ECO/ESO**: Environmental Site/Control Officer – person responsible for the Day-to-Day Environmental Management on-site during construction.
- **Ecocline:** a type of landscape boundary, with a gradual and continuous change in environmental conditions of an ecosystem or community. Ecoclines help explain the distribution and diversity of organisms within a landscape because certain organisms survive better under certain conditions, which change along the ecocline. They contain heterogeneous communities which are considered more environmentally stable than those of ecotones.
- **Ecosystem:** All of the organisms of a particular habitat, such as a lake or forest, together with the physical environment in which they live.
- **Ecosystem status** ecosystem status of terrestrial ecosystems is based on the degree of habitat loss that has occurred in each ecosystem, relative to two thresholds: one for maintaining healthy ecosystem functioning, and one for conserving the majority of species associated with the ecosystem. As natural habitat is lost in an ecosystem, its functioning is increasingly compromised, leading eventually to the collapse of the ecosystem and to loss of species associated with that ecosystem. See Critically Endangered, Endangered, Vulnerable, Least Threatened.
- **Ecological processes** ecosystems work because they are kept "alive" by ecological processes such as pollination, nutrient cycling, disturbance (e.g. fire), migration of species or soil maintenance.

  - In all areas where spatial components of ecological processes occur, loss or degradation of natural habitat should be avoided, to ensure that the ecological processes concerned continue to function.
  - Ecological processes typically only function well where natural vegetation remains, and in particular where the remaining vegetation is well-connected with other nearby patches of natural vegetation. Loss and fragmentation of natural habitat severely threatens the integrity of ecological processes. Where basic processes are intact, ecosystems are likely to recover more easily from disturbances or inappropriate actions if the actions themselves are not permanent. Conversely, the more interference there has been with basic processes, the greater the severity (and longevity) of effects. Natural processes are complex and interdependent, and it is not possible to predict all the consequences of loss of biodiversity or ecosystem integrity. When a region's natural or historic level of diversity and integrity is maintained, higher levels of system productivity are supported in the long run and the overall effects of disturbances may be dampened.
  - Other examples of processes include plant-herbivore processes, diversification of plant lineages along soil type transitions and lowland to upland gradients, natural fire regimes, predator-prey relationships, migration and exchange between inland and coastal biota (often along river corridors), faunal seasonal migration and hydrologic regimes.

- **Ecotone:** the transitional zone between two communities. Ecotones can arise naturally, such as a lakeshore, or can be human-created, such as a cleared agricultural field from a forest. The ecotonal community retains characteristics of each bordering community and often contains species not found in the adjacent communities. Classic examples of ecotones include fencerows; forest to marshlands transitions; forest to grassland transitions; or land-water interfaces such as riparian zones in forests. Characteristics of ecotones include vegetational sharpness, physiognomic change, and occurrence of a spatial community mosaic, many exotic species, ecotonal species, spatial mass effect, and species richness higher or lower than either side of the ecotone.
- **Edge:** the portion of an ecosystem near its perimeter, where influences of the adjacent patches can cause an environmental difference between the interior of the patch and its edge. This edge effect includes a distinctive species composition or abundance in the outer part of the landscape patch. For example, when a landscape is a mosaic of perceptibly different types, such as a forest adjacent to a grassland, the edge is the location where the two types adjoin. In a continuous landscape, such as a forest giving way to open woodland, the exact edge location is fuzzy and is sometimes determined by a local gradient exceeding a threshold, such as the point where the tree cover falls below thirty-five percent.
- **Emergent trees:** Trees that grow above the top of the canopy
- **Endangered:** endangered terrestrial ecosystems have lost significant amounts (more than 60 % lost) of their original natural habitat, so their functioning is compromised.
- **Endemic** a plant or animal species, or a vegetation type, which is naturally restricted to a particular defined region. It is often confused with indigenous, which means 'native, occurring naturally in a defined area'.
- **Exotic:** Non-indigenous; introduced from elsewhere, may also be a *weed* or *invasive* species.
- **Fragmentation:** causes land transformation, an important current process in landscapes as more and more development occurs.
- **Function:** refers to how each element in the landscape interacts based on its life cycle events.
- **Habitat** the home of a plant or animal species. Generally those features of an area inhabited by animal or plant which are essential to its survival.
- **Heterogeneity:** A landscape with structure and pattern implies that it has spatial heterogeneity or the uneven, non-random distribution of objects across the landscape.
- **Indigenous:** Native; naturally occurring.
- **Invasive:** a non-indigenous plant or animal species that adversely affect the habitats it invades economically, environmentally or ecologically.
- **Least threatened terrestrial ecosystems** These ecosystems have lost only a small proportion (more than 80 % remains) of their original natural habitat, and are largely intact (although they may be degraded to varying degrees, for example by invasive alien species, overgrazing, or overharvesting from the wild).
- **Matrix:** the “background ecological system” of a landscape with a high degree of connectivity.
- **Network:** an interconnected system of corridors while mosaic describes the pattern of patches, corridors and matrix that form a landscape in its entirety.

- **Off-sets:** compensation for biodiversity loss resulting from authorized changes in land use. Can include assigning stewardship or protected area status to remaining conservation-worthy land or making a financial bequest for purposes of biodiversity conservation.
- **Patch:** a term fundamental to landscape ecology, is defined as a relatively homogeneous area that differs from its surroundings. Patches are the basic unit of the landscape that change and fluctuate, a process called patch dynamics. Patches have a definite shape and spatial configuration, and can be described compositionally by internal variables such as number of trees, number of tree species, height of trees, or other similar measurements.
- **Pattern:** is the term for the contents and internal order of a heterogeneous area of land.
- **Refuge:** a location of an isolated or relict population of a once widespread animal or plant species
- **Rill:** A very small stream of water
- **Riparian:** pertaining to, situated on or associated with a river bank.
- **River corridors**: River corridors perform a number of ecological functions such as modulating streamflow, storing water, removing harmful materials from water, and providing habitat for aquatic and terrestrial plants and animals. These corridors also have vegetation and soil characteristics distinctly different from surrounding uplands and support higher levels of species diversity, species densities, and rates of biological productivity than most other landscape elements. Rivers provide for migration and exchange between inland and coastal biotas.
- **Shrub:** A woody plant that produces no trunk but branches from the base.
- **STEP**: Sub-Tropical Ecosystem Planning.
- **Under-story:** the area of a forest which grows in the shade of the canopy. Plants in the understory consist of a mixture of seedlings and saplings of canopy trees together with understory shrubs and herbs. Young canopy trees often persist as suppressed juveniles for decades while they wait for an opening in the forest overstory, which will enable their growth into the canopy. On the other hand, understory shrubs are able to complete their life cycle in the shade of the forest canopy.
- **Structure:** is determined by the composition, the configuration, and the proportion of different patches across the landscape.
- **Transformation** in ecology, transformation refers to adverse changes to biodiversity, typically habitats or ecosystems, through processes such as cultivation, forestry, drainage of wetlands, urban development or invasion by alien plants or animals. Transformation results in habitat fragmentation - the breaking up of a continuous habitat, ecosystem, or land-use type into smaller fragments.
- **Tributary/Drainage line:** A small stream or river flowing into a larger one.
- **Vulnerable:** vulnerable terrestrial ecosystems have lost some (more than 60 % remains) of their original natural habitat, and their functioning will be compromised if they continue to lose natural habitat.
- **Weed:** an indigenous or non-indigenous plant that grows and reproduces aggressively, usually a ruderal pioneer of disturbed areas. Weeds may be unwanted because they are unsightly, or they limit the growth of other plants by blocking light or using up nutrients from the soil. They also can harbour and spread plant pathogens.
- **Wetlands:** a collective term used to describe lands that are sometimes or always covered by shallow water or have saturated soils, and where plants adapted for life in wet conditions usually grow. Collectively, wetlands and their associated vegetation are highly diverse and productive ecosystems. Despite their invaluable social and environmental roles, wetlands have been identified as being among southern Africa's most threatened and neglected habitats. Wetlands perform a number of valuable ecosystem functions.

1 Introduction & Background

Mr Jamie Pote (Engineering Advice and Services) was sub-contracted by Sharples Environmental Services to conduct an assessment on the potential impact of the proposed development on the biophysical environment, including vegetation, flora and fauna in the area.

1.1 Project Description

1.1.1 Activity Location

The proposed site is situated near Kranshoek, west of Plettenberg Bay, as indicated in Figure 1 below.

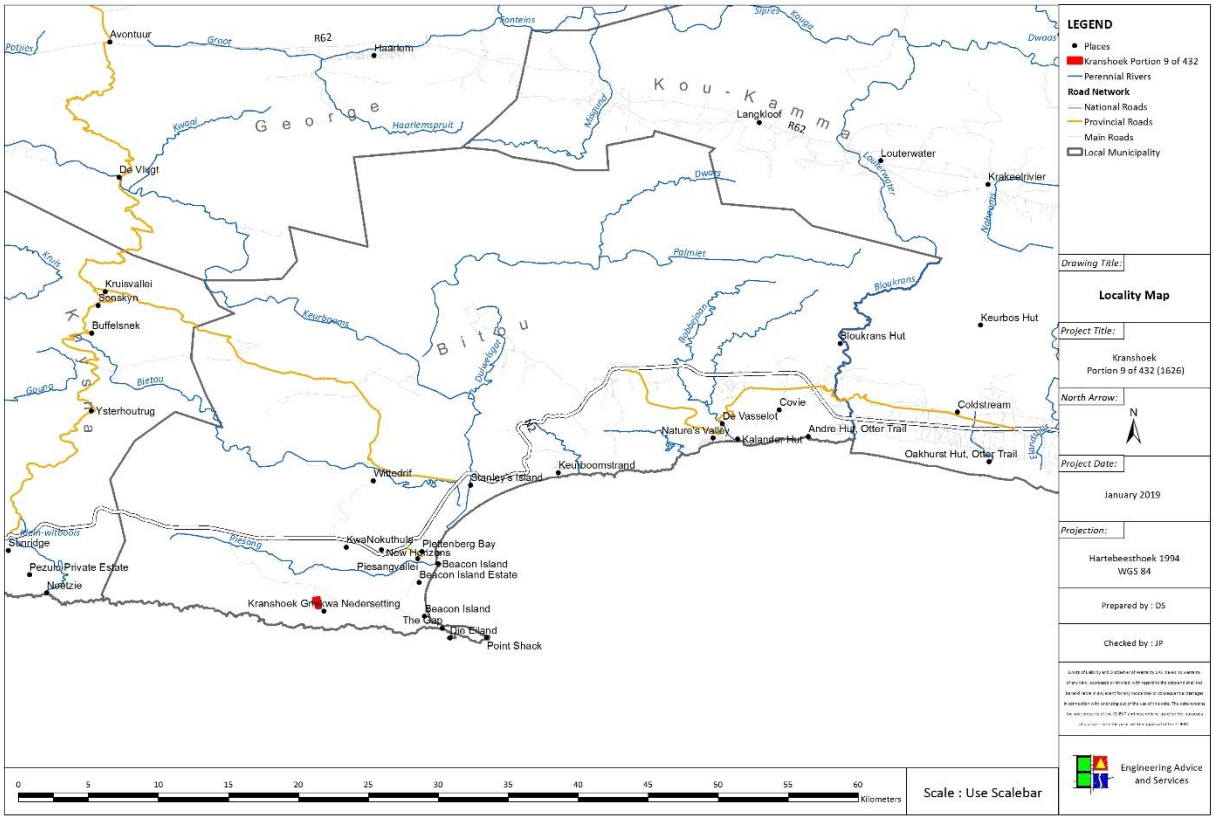


Figure 1: Site Locality.

1.1.2 Activity Description

The proposed site is located upon undeveloped land on Farm 432 Portion 9. The site is positioned to the east of the town of Kranshoek and abuts Trekkerspad where the urban development starts. Urban development consisting of affordable housing and a school can be found to the west of the site with mostly vacant land to the north and agricultural farm portions to the east and south (Figure 2).

The original total extent of Portion 9 of the Farm Kranshoek No. 432 was 25.9487 Ha. Approval was granted in terms of Act 70 of 1970 for the subdivision, rezoning and departure on a portion (0.46 Ha) of Portion 9 of Farm Kranshoek No. 432 reducing the size of the remainder of the land to approximately 25.58 Ha.

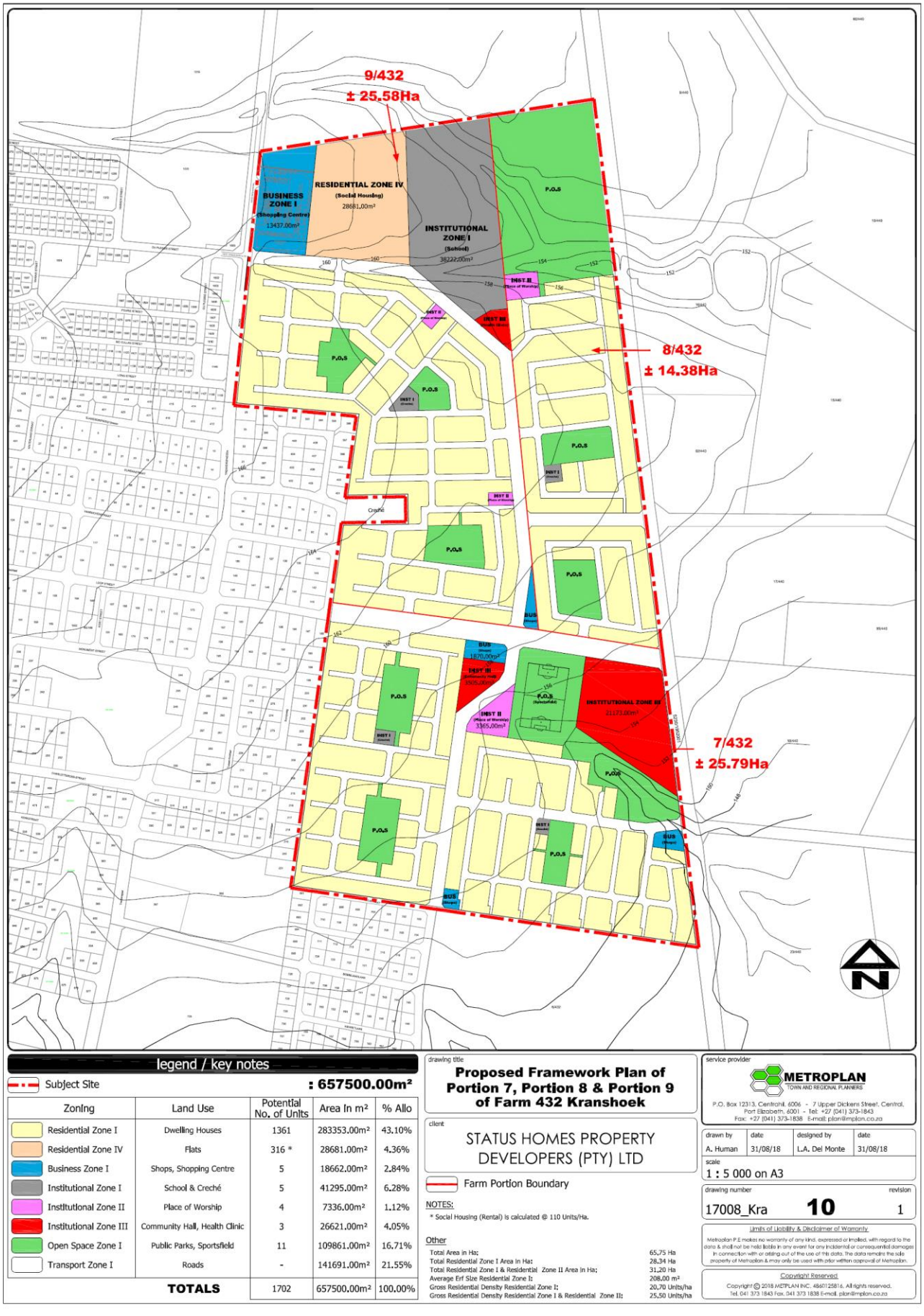


Figure 2: Proposed Development Plan (Alternative 1)

1.2 Terms of Reference

Sharples Environmental Services cc (SES) has been appointed as the independent Environmental Assessment Practitioner (EAP) to conduct the Environmental Impact Assessment process for this Proposed Development of Kranshoek Farm 432, Plettenberg Bay and requires specialist terrestrial ecological input.
Kranshoek is situated approximately 8km by road from the Town Centre of Plettenberg Bay off the Robberg Road which connects western portions of Plettenberg Bay through the Robberg Road to the N2 further west.

The assessment of the proposal will necessitate specialist input which will need to be undertaken with the Terms of Reference listed below and relevant specialist guidelines. In addition to meeting the requirements of the relevant legislation, ecological reports should also meet those of the Guideline for Involving Biodiversity Specialists in EIA Processes. The Fynbos Forum Ecosystem Guidelines for Environmental Assessment in the Western Cape, published by the Fynbos Forum and Botanical Society of South Africa, as well as national, provincial and municipal biodiversity and development planning documents must be consulted where available. The ecologist or biodiversity specialist must have no financial or other vested interest in the proposed development and must be professionally registered with the South African Council for Natural Scientific Professionals, SACNASP (see Appendix F).

1.2.1 Phase 1 (Status Quo Analysis)

- Contextualization of the study area in terms of important biophysical characteristics and the latest available conservation planning information (including but not limited to vegetation, CBAs, Threatened ecosystems, any Red data book information, sensitive and protected areas).
- Undertake a site visit and ground-truth biodiversity information. Where required, undertake baseline surveys and/or studies to supplement the information base and inform the assessment.
- Describe and map important biodiversity (both vegetation and fauna) on the site and in the wider landscape, from both pattern and ecological process perspectives. Additionally, describe areas or features off site that could be indirectly impacted by the proposed land use.
- Note the condition of affected ecosystems and levels of degradation, including infestation by invasive alien species.
- Estimate the trajectory of change in the context of the 'No-Go' Alternative due to existing impacts.
- Record inconsistencies between the biodiversity plans/CBA maps/ FEPA maps and the 'on the ground' situation.
- Produce a sensitivity map of the vegetation of the site and any critical faunal habitat.

1.2.2 Phase 2 (Impact Assessment)

- Identification, prediction and description of potential impacts on terrestrial ecology during the construction and operational phases of the project. Impacts are described in terms of their extent, intensity, and duration. The other aspects that must be included in the evaluation are probability, reversibility, irreplaceability, mitigation potential, and confidence in the evaluation.
- This must be undertaken for all of the alternatives and must be rated with and without mitigation to determine the significance of the impacts.
- Recommend actions that should be taken to avoid impacts on sensitive ecology, in alignment with the mitigation hierarchy, and any measures necessary to restore disturbed areas or ecological processes.
- Identify areas of high importance or sensitivity on which impacts should preferably be avoided or prevented or, where they cannot altogether be avoided, should at least be minimized (e.g. through buffers or setbacks).
- Identify areas that are known to be important for biodiversity but are degraded or invaded by alien species and require rehabilitation/restoration, including areas that could improve connectivity and reduce fragmentation in the landscape.
- Identify areas that would be worthy of protection (for example, through biodiversity stewardship).

- Evaluate whether or not the likely impacts would compromise the desired management objectives for the specific biodiversity areas or features (CBA, ESA, FEPA, protected area, etc).
- An accurate description and map of the areas and features of importance to biodiversity and their sensitivity to the proposed development. Possibly recommend alternatives.
- Rehabilitation guidelines for disturbed areas associated with the proposed project.
- Any monitoring protocol that is deemed necessary

1.3 Proposed Methodology and Approach

The proposed methodology and approach is outlined below:

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

1.4 Legal Framework

Constitution of Republic of South Africa (1996): Section 24(a) of the Constitution states that everyone has the right *'to an environment that is not harmful to their health or well-being'*. Construction activities must comply with South African constitutional law by conducting their activities with due diligence and care for the rights of others.

NEMA: Environmental management principles set out in NEMA, and other Specific Environmental Management Acts (SEMAs) should guide decision making throughout the project life cycle to reflect the objective of sustainable development. One of the most important and relevant principles is that disturbance of ecosystems, loss of biodiversity, pollution and degradation of environment and sites that constitute the nation's cultural heritage should be avoided, minimised or as a last option remedied. This is supported by the Biodiversity Act as it relates to loss of biodiversity.

EIA Regulations (GN No. R. 543): Published in terms of NEMA trigger the need for applicants to undertake either a Basic Assessment or Scoping and Environmental Impact Assessment if the proposed activity is included in one or more of the three Listing Notices; and Listing Notice 3 (listing activities and sensitive areas per province, for which a Basic Assessment process must be conducted) (GN No. R. 546).
In some cases both the MPRDA and NEMA require the identification, assessment and evaluation of impacts, and the determination of appropriate mitigation measures. An EMP may be required for activities subject to an EIA under NEMA.

Western Cape Nature Conservation Laws Amendment Act (3 Of 2000): Provide for the amendment of various laws on nature conservation in order to transfer the administration of the provisions of those laws to the Western Cape Nature Conservation Board; to amend the Western Cape Nature Conservation Board Act, 1998 to provide for a new definition of Department and the deletion of a definition; to provide for an increase in the number of members of the Board; to provide for additional powers of the Board; to amend the provisions regarding the appointment and secondment of persons to the Board; and to provide for matters incidental thereto. Section 63 relates to the picking of protected flora:

Prohibition on picking of certain flora
63. (1) No person shall—
(a) uproot the plant in the process of picking the flower of any flora;
(b) without a permit—
(i) pick any endangered or protected flora, or
(ii) pick any flora on a public road or on the land on either side of such road
within a distance of ninety metres from the centre of such road, or
(c) pick any protected or indigenous unprotected flora on land of which he or she is not the owner, without the permission of the owner of such land or of any person authorised by such owner to grant such permission.
(2) No permission granted in terms of subsection (1)(c) shall be valid unless it is reduced to writing and reflects—
(a) the full names and address of the owner of the land concerned or of the person authorised to grant such permission;
(b) the full names and address of the person to whom permission is granted, and
(c) the number and species of flora, the date or dates on which such flora may be picked and the land in respect of which permission is granted, and is signed and dated by such owner or the person authorised by him or her.
(3) The provisions of subsection (1)(b) shall not apply to the owner of any land, any relative of such owner and any full-time employee of such owner acting on the instructions or with the consent of such owner, in respect of any protected or indigenous unprotected flora on such land.
(4) The provisions of subsection (1)(b)(i) shall not apply to any person authorized in writing by the owner of any land to pick any protected flora on such land for the purpose of gathering and propagating the seed of such flora.

Provincial Nature Conservation Ordinance (PNCO) of 1974: Protected indigenous plants in general are controlled under the relevant provincial Ordinances or Acts dealing with nature conservation. In the Eastern Cape the relevant statute is the 1974 Provincial Nature Conservation Ordinance. In terms of this Ordinance, a permit must be obtained from Department of Economic Affairs Environment and Tourism (DEAET) to remove or destroy any plants listed in the Ordinance.

Water Use Authorisations: the National Water Act (No. 36 of 1998): Requires that provision is made both in terms of water quantity and quality for 'the reserve', namely to meet the ecological requirements of freshwater systems and basic human needs of downstream communities. It is essential in preparing an EMP that any impacts on water resources, be they surface water or groundwater resources, and/ or impacts on water quality or flow, are carefully assessed and evaluated against both the reserve requirement and information on biodiversity priorities. This

information will be required in applications for water use licenses or permits and/or in relation to waste disposal authorisations.

Environment Conservation Act and Regulations GN154: Development must be environmentally, socially and economically sustainable. Sustainable development requires the consideration of inter alia the following factors:

a) that pollution and degradation of the environment is avoided, or, where they cannot be altogether avoided, are minimised and remedied;
b) that waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;
c) that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;
d) that the development, use and exploitation of renewable resources and the eco-systems of which they are part do not exceed the level beyond which their integrity is jeopardised; and
e) that negative impacts on the environment and on peoples' environmental rights be anticipated and prevented, and where they cannot be altogether prevented are minimised and remedied.
f) Environmental management must place people and their needs at the forefront of its concern, therefore any environmental impacts resulting from the development activities are not distributed in such a manner as to unfairly discriminate against any persons, particularly vulnerable and disadvantaged persons.
g) In terms of section 20, the developer is required to obtain a permit from DWAF in order to establish, provide or operate any waste disposal site within the boundaries of the property.
h) Where medical, hazardous or domestic wastes are to be removed from the site by contractors, the developer needs to place a contractual obligation on the contractor to dispose of the waste at a licensed site and to ensure that this is properly done.
i) The developer is required to undertake Environmental Impact Assessments (EIA) for all projects listed as a Schedule 1 activity in the EIA regulations in order to control activities which might have a detrimental effect on the environment. Such activities will only be permitted with written authorisation from a competent authority.

Forest Act 122 of 1984: Protected trees: The Forest Act provided for the protection of trees on private land by providing that 'no person may cut, damage, destroy, disturb or remove any *protected tree* from the land in question, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any part or produce thereof'. The Minister was authorised, in respect of any land not forming part of a State forest, to declare a particular tree, a particular group of trees, or trees belonging to a particular species occurring on that land, to be a protected tree or trees (Appendix 6) Regulations published under the Act list 58 species of protected trees to which these prohibitions apply. Although the NFA has repealed the old Forest Act, the majority or regulations promulgated under the Act still remain in force until such time they are replaced by new regulations under the NFA.

National Forests Act 84 of 1998: Protected trees: The Minister may declare a tree, group of trees, woodland or a species of trees as protected. The Minister is required to publish a list of all species protected under this Act, an appropriate warning of the prohibitions set out and the consequences of its infringements, annually in the Government Gazette. The prohibitions provide that ' no person may cut, damage, disturb, destroy or remove any *protected tree*, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister'.

Conservation of Agricultural Resources Act 43 of 1983 and Conservation of Agricultural Resources Regulations: In terms of section 6 of the Act, the Minister may prescribe control measures with which all land users have to comply. The control measure may relate to the following:

a) the regulating of the flow pattern of run-off water;
b) the control of weeds and invader plants;
c) the restoration or reclamation of eroded land or land which is otherwise disturbed or denuded;

Liability for any environmental damage, pollution, or ecological degradation: Arising from any and all -related activities occurring inside or outside the area to which the permission/right/permit relates is the responsibility of the rights holder. The National Water Act and NEMA both oblige any person to take all reasonable measures to prevent pollution or degradation from occurring, continuing or reoccurring (polluter pays principle). Where a person/company fails to take such measures, a relevant authority may direct specific measures to be taken and, failing that, may carry out such measures and recover costs from the person responsible.

Public participation: Public consultation and participation processes prior to granting licences or authorisations can be an effective way of ensuring that the range of ways in which the activities impact on the environment, social and economic conditions are addressed, and taken into account when the administrative discretion to grant or refuse the licence is made.

1.5 Systematic Planning Frameworks

A screening of Regional Biodiversity Features was undertaken, that included the following features:

- Vegetation Types (National and Regional)
- Critically Endangered and Endangered Ecosystems (NBA)
- Critical Biodiversity Areas (Western Cape BSP and Garden Route BSP)
- Ecological Support Areas (Western Cape BSP and Garden Route BSP)
- Vulnerable Ecosystems (NBA)
- River and Wetland Freshwater Ecosystem Priority Areas (FEPAs)
- 100 m buffer of Rivers and Wetlands (FEPAs)
- International Bird Areas (IBA's)
- Protected Areas (SAPAD)
- Protected Area buffers (5/10 km as per EIA Regs)

Table 1: Summary of Biodiversity features.

Feature	Description	Implications/Comment
The Vegetation of South Africa Lesotho and Swaziland (Vegmap; Mucina & Rutherford) and	South Outeniqua Sandstone Fynbos (FFs19)	Vulnerable
National Biodiversity Assessment (NBA)	South Outeniqua Sandstone Fynbos (FFs19)	Vulnerable
Subtropical Thicket Ecosystem Project (STEP)	No Thicket present	N/A
Western Cape Biodiversity Sector Plan	South Outeniqua Sandstone Fynbos	Vulnerable
Garden Route Biodiversity Sector Plan	Roodefontein Grassy Fynbos Groot Brak River and Floodplain	A section of Groot Brak River and Floodplain Ecological Process area is identified along the north-eastern boundary of the site.
Critically Endangered and Endangered Ecosystems	None	N/A
IBA's	None	N/A

Feature	Description	Implications/Comment
Protected Areas in vicinity	• Robberg Coastal Corridor Protected Environment • Fynbos Nature Reserve	• 1.5 km south of development site • 2 km south-west of development site
Protected Area buffers	• Within 5 km of protected areas	Applicable EIA listing notices may be relevant
Rivers within Study Area	Piesang River is located to the north	Not in close proximity
Within 500 m of Rivers and Wetlands	A small unnamed drainage line passes through the northern portion of the site, which is part of an unnamed river that runs south-east.	Stormwater runoff may have downstream impacts
Within 100 m of River or Wetland	Unnamed non-perennial streams	Stormwater runoff may have downstream impacts
Within 32 m of a watercourse/wetland	A small unnamed drainage line passes through the northern portion of the site, which is part of an unnamed river that runs south-east.	Proposed development is adjacent to unnamed non-perennial rivers and streams. Impacts relating to stormwater runoff within the drainage lines are likely to be present. **A minimum 32 m buffer is recommended around drainage lines and stormwater retention features may be required.**
Geology	Ope (Arenite)	Whole site is comprised of Arenite (Sandstone)
Land Uses	Natural and Degraded with low to moderate alien vegetation and areas transformed due to historical residential and agricultural development.	Some disturbance is present
Vulnerable Ecosystems	South Outeniqua Sandstone Fynbos	Impacts to the overall vegetation type at a regional level will be negligible due to widespread distribution. Site (25.5 Ha) contributes 0.02 % of the total vegetation unit (157411 Ha) regionally.
Critical Biodiversity Areas (Western Cape and Garden Route BSPs)	None	N/A
Ecological Support Areas (Western Cape BSP)	ESA 2 along northern-eastern boundary and Other Natural Area portion within the site.	An ESA 2 along northern boundary should be conserved and rehabilitated to maintain local ecological processes and connectivity with surrounding area.
Ecological Support Areas (Garden Route BSP)	Groot Brak River and Floodplain Ecological Process Area	A section of *Groot Brak River and Floodplain* Ecological Process area is identified along the north-eastern boundary and should be conserved and rehabilitated to maintain local ecological processes and connectivity (as for above).

1.5.1 Vegetation of Southern Africa (Vegmap)

The units primarily affected by the proposed development is *South Outeniqua Sandstone Fynbos* which has a **Vulnerable** Conservation Status. The site is also in the general vicinity of areas having *Garden Route Shale Fynbos* (**Endangered)** and *Knysna Sand Fynbos* (**Endangered**). No elements of these units were noted to be present.

South Outeniqua Sandstone Fynbos (FFs19)

Distribution Western Cape Province: Southern slopes of the Outeniqua Mountains from the Cloetesberg northeast of Albertinia in the west to the upper reaches of the Keurbooms River where it borders on FFs 20 Tsitsikamma Sandstone Fynbos. It includes sandstone outcrops on the lowlands from the vicinity of the Goukamma River near Knysna in the west and Komkromma Point near Nature's Valley in the east. Altitude from the coast to 1 579 m on Cradock's Berg north of George.

Vegetation & Landscape Features Gentle to steep south-facing slopes, over a 160 km long area, relatively broad with some moderately sloping intramontane valleys in the west where it is over 10 km wide. The dominant vegetation is a tall, open to medium dense shrubland with medium dense, medium tall shrub understorey—mainly proteoid and restioid fynbos, with extensive ericaceous fynbos on the upper slopes. Some grassy fynbos at lower altitudes, and scrub fynbos in riverine areas. Patches of this unit are not confined to south-facing slopes, but are found on all slopes south of the highest peaks in the range. Thus there are extensive northern slopes in some intramontane valley systems, the most significant of those found in the Doring River Wilderness Area.

Geology & Soils Acidic lithosol soils derived from Ordovician sandstones of the Table Mountain Group (Cape Supergroup). Land types mainly Ib, Gb and Fa.

Climate MAP 360–1 170 mm (mean: 785 mm), with a slight bimodal winter and a low in December. Mean daily maximum and minimum temperatures 27.8°C and 4.8°C for January and July, respectively. Frost incidence 2–10 days per year.

Important Taxa (Cape thickets, Wetlands) Small Tree: *Widdringtonia nodiflora*. Tall Shrubs: *Chrysanthemoides monilifera* (d), *Laurophyllus capensis* (d), *Leucadendron conicum* (d), *L. eucalyptifolium* (d), *L. uliginosum* subsp. *uliginosum* (d), *Metalasia densa* (d), *Protea neriifolia* (d), *P. repens* (d), *Anginon difforme*, *Dodonaea viscosa* var. *angustifolia*, *Halleria lucida*, *Leucospermum glabrum*, *Liparia hirsuta*, *Metalasia trivialis*, *Mimetes pauciflorus*, *Osteospermum junceum*, *Passerina falcifolia*, *Podalyria burchellii*, *P. sericea*, *Protea mundii*, *Psoralea affinis*, *Pterocelastrus tricuspidatus*. Low Shrubs: *Berzelia intermedia* (d), *Brunia nodiflora* (d), *Erica cordata* (d), *E. densifolia* (d), *E. glomiflora* (d), *E. triceps* (d), *E. uberiflora* (d), *Leucadendron ericifolium* (d), *Penaea cneorum* subsp. *cneorum* (d), *P. cneorum* subsp. *gigantea* (d), *Acmadenia maculata*, *A. tetragona*, *Anisodontea scabrosa*, *Aspalathus angustifolia* subsp. *angustifolia*, *A. ciliaris*, *A. rubens*, *Cliffortia ilicifolia*, *C. stricta*, *Erica deflexa*, *E. discolor* variant '*speciosa*', *E. formosa*, *E. fuscescens*, *E. gracilis*, *E. hispidula*, *E. lanata*, *E. nabea*, *E. similis*, *E. simulans*, *E. sparsa*, *E. versicolor*, *Euryops pinnatipartitus*, *Lachnaea diosmoides*, *Leucadendron comosum* subsp. *comosum*, *L. salignum*, *L. spissifolium* subsp. *fragrans*, *Leucospermum cuneiforme*, *L. wittebergense*, *Linconia alopecuroidea*, *Lobelia neglecta*, *Mimetes cucullatus*, *Otholobium carneum*, *Phaenocoma prolifera*, *Phylica confusa*, *Protea cynaroides*, *P. lorifolia*, *Pseudobaeckea cordata*, *Relhania calycina*, *Senecio glastifolius*, *Stoebe alopecuroides*, *Struthiola eckloniana*, *Syncarpha paniculata*, *Ursinia coronopifolia*, *U. scariosa* subsp. *scariosa*, *U. trifida*. Semiparasitic Shrub: *Thesium virgatum*. Herbs: *Carpacoce spermacocea*, *Centella affinis*, *C. virgata*, *Dichrocephala integrifolia* subsp. *integrifolia*, *Helichrysum felinum*, *Mairia crenata*. Geophytic Herbs: *Pteridium aquilinum* (d), *Blechnum attenuatum*, *Caesia contorta*, *Geissorhiza bracteata*, *G. fourcadei*, *G. inconspicua*, *Lanaria lanata*, *Romulea fibrosa*, *Tritoniopsis caffra*, *Watsonia fourcadei*. Carnivorous Herb: *Drosera trinervia*. Herbaceous Parasitic Climber: *Cassytha ciliolata*. Graminoids: *Cannomois parviflora* (d), *C. virgata* (d), *Ehrharta dura* (d), *E. rupestris* subsp. *tricostata* (d), *Elegia fistulosa* (d), *E. galpinii* (d), *E. juncea* (d), *Epischoenus adnatus* (d), *Hypodiscus albo-aristatus* (d), *H. aristatus* (d), *H. striatus* (d), *H. synchroolepis* (d), *Ischyrolepis gaudichaudiana* (d), *Merxmuellera rufa* (d), *Pentameris distichophylla* (d), *Platycaulos anceps* (d), *P. compressus* (d), *Restio fourcadei* (d), *R. triticeus* (d), *Rhodocoma gigantea* (d), *Tetraria cuspidata* (d), *T. involucrata* (d), *T. microstachys* (d), *Andropogon appendiculatus*, *Anthochortus ecklonii*, *Cannomois scirpoides*, *Capeobolus brevicaulis*, *Chrysitrix capensis*, *Cyathocoma hexandra*, *Ficinia gracilis*, *Mastersiella purpurea*, *Merxmuellera decora*, *Pentaschistis colorata*, *P. malouinensis*, *P. pallida*, *Restio strictus*, *Staberoha aemula*, *Tetraria capillacea*, *T. fimbriolata*, *T. sylvatica*, *T. thermalis*, *T. ustulata*, *Thamnochortus cinereus*, *Themeda triandra*, *Willdenowia teres*.

Endemic Taxa (Wetlands) Low Shrubs: *Erica unicolor* (d), *Penaea acutifolia* (d), *Acmadenia gracilis*, *A. rupicola*, *Agathosma alaris*, *A. planifolia*, *Amphithalea flava*, *Aspalathus bowieana*, *A. digitifolia*, *Erica aneimena*, *E. gillii*,

E. inconstans, E. juniperina, E. lehmannii, E. outeniquae, E. priorii, E. velatiflora, Leucadendron olens, Leucospermum hamatum, Phylica curvifolia, Prismatocarpus rogersii, Psoralea vlokii, Xiphotheca phylicoides, Zyrphelis outeniquae. Succulent Shrub: *Lampranthus pauciflorus*. Herb: *Linum villosum*. Geophytic Herb: *Geissorhiza outeniquensis*.
Conservation Vulnerable. Target 23%. Statutorily conserved (47%) in the proposed Garden Route National Park, Doring River Wilderness Area as well as in Ruitersbos and Witfontein Nature Reserves. About 2% protected in private nature reserves. Some 28% transformed (pine plantations, cultivation). Alien *Pinus pinaster* and *Hakea sericea* scattered over part of the area. Erosion very low.
Remarks The western boundaries of this unit are discussed under FFs 16 South Langeberg Sandstone Fynbos. The Cedarberg Shale Bands were not adequately mapped within this unit due to a lack of proper geological coverage. The eastern boundary is also more of a transition zone and is somewhat arbitrarily taken as approximating the Keurbooms River (for the mountain section). It can be refined when sufficient distributional data become available.

Implications: 47% of the vegetation type is statutorily conserved in the proposed Garden Route National Park, Doring River Wilderness Area as well as in Ruitersbos and Witfontein Nature Reserves. About 2% protected in private nature reserves. The vegetation type is thus well conserved.

1.5.2 Subtropical Ecosystem Planning (STEP)

No thicket vegetation present (Keurbooms Grassy Fynbos). A large portion (southern) of the site is indicated as transformed by STEP.

1.5.3 Western Cape Biodiversity Spatial (WC BSP)

The Western Cape Biodiversity Spatial Plan (WC BSP) is a spatial tool that forms part of a broader set of national biodiversity planning tools and initiatives that are provided for in national legislation and policy. It comprises the Biodiversity Spatial Plan (BSP) map of biodiversity priority areas, accompanied by contextual information and land use guidelines that make the most recent and best quality biodiversity information available for use in land use and development planning, environmental assessment and regulation, and natural resource management.

Critical Biodiversity Areas (CBAs)

Areas *that are required to meet biodiversity targets for species, ecosystems or ecological processes and infrastructure*. These include:

- All areas required to meet biodiversity pattern (e.g. species, ecosystems) targets;
- Critically Endangered (CR) ecosystems (terrestrial, wetland and river types);
- All areas required to meet ecological infrastructure targets, which are aimed at ensuring the continued existence and functioning of ecosystems and delivery of essential ecosystem services; and
- Critical corridors to maintain landscape connectivity.

CBAs are areas of high biodiversity and ecological value and need to be kept in a natural or near-natural state, with no further loss of habitat or species. Degraded areas should be rehabilitated to natural or near-natural condition. **Only low-impact, biodiversity-sensitive land uses are appropriate**.

Implications: No Critical Biodiversity Areas are affected within the site.

LAND USE CATEGORIES		Conservation		Agriculture		Tourism and Recreational Facilities		Rural Accomodation		Urban			Business & Industrial				Infrastructure Installations			
LAND USE SUB-CATEGORIES (Refer to table 4.7 for descriptions)		Proclaimed Protected Areas	Other Nature Areas	Intensive Agriculture	Extensive Agriculture	Low Impact Facilities	High Impact Facilities	Agri-worker Accommodation	Small holdings	Urban Development & Expansion	Community Facilities & Institutions	New Settlements	Rural Business	Non-place-bound Industry (low-moderate impact)	Non-place-bound Industry (high impact)	Extractive Industry (incl. Prospecting)	Linear – roads & rail	Linear – pipelines & canals	Linear – powerlines	Other Utilities
MAP CATEGORY	DESIRED MANAGEMENT OBJECTIVE	Y = Yes: Permissible land uses that are likely to compromise the biodiversity objective						R = Restricted: Land-uses that may compromise the biodiversity objective are only permissible under certain conditions (refer to Table 4.7 for conditions)					N = No: Land-uses that will compromise the biodiversity objective and are not permissible							
Protected Area	Must be kept in a natural state, with a management plan focused on maintaining or improving the state of biodiversity.	Land use within proclaimed protected areas are subject to management plan drawn up for that specific protected area.																		
Critical Biodiversity Area 1	Keep natural, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land-uses are appropriate.	Y	Y	N	R	N	N	N	N	N	N	N	N	N	N	N	N	N	R	N
Critical Biodiversity Area 2	Keep natural, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land-uses are appropriate.	Y	Y	N	R	R	N	N	N	N	N	N	N	N	N	N	R	R	R	N
Ecological Support Area 1: Terrestrial	Maintain in a functional, near-natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised.	Y	Y	N	R	R	N	N	N	N	N	N	R	R	N	N	R	R	R	R
Ecological Support Area 1: Aquatic	Maintain in a functional, near-natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised.	Y	Y	N	R	R	N	N	N	N	N	N	N	N	N	N	R	R	R	N
Ecological Support Area 2	Restore and/or manage to minimise impact on ecological infrastructure functioning; especially soil and water-related services.	Y	Y	N	R	R	N	N	R	N	N	N	N	N	N	N	R	R	R	R
ONA: Natural to Near-Natural	Minimise habitat and species loss and ensure ecosystem functionality through strategic landscape planning. Offers flexibility in permissible land-uses, but some authorisation may still be required for high impact land uses.	Y	Y	R	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
ONA: Degraded	Minimise habitat and species loss and ensure ecosystem functionality through strategic landscape planning. Offers flexibility in permissible land-uses, but some authorisation may still be required for high impact land uses.	R	R	R	Y	Y	R	R	Y	R	R	R	R	R	R	R	Y	Y	Y	Y
No Natural Remaining	These areas are suitable for development but may still provide limited biodiversity and ecological infrastructure functions and should be managed in a way that minimises impacts on biodiversity and ecological infrastructure.	R	R	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Ecological Support Areas (ESAs)

Areas that are <u>not essential for meeting biodiversity targets</u>, but that play an <u>important role in supporting the functioning of PAs or CBAs</u>, and are often vital for delivering ecosystem services. They support landscape connectivity, encompass the ecological infrastructure from which ecosystem goods and services flow, and strengthen resilience to climate change. They include features such as regional climate adaptation corridors, water source and recharge areas, riparian habitat surrounding rivers or wetlands, and endangered vegetation.

ESAs <u>need to be maintained in at least a functional and often natural state</u>, in order to support the purpose for which they were identified, but some limited habitat loss may be acceptable. A greater range of land uses over wider areas is appropriate, subject to an authorisation process that ensures the underlying biodiversity objectives and ecological functioning are not compromised. Cumulative impacts should also be explicitly considered.

<u>Implications:</u> A small portion of Ecological Support Area is identified along the north-eastern boundary. This area should be maintained as Open Space to protect ecological processes and connectivity with surrounding area (In line with guidelines).

Other Natural Areas (ONAs)

Areas that <u>have not been identified as a priority in the current biodiversity spatial plan but retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions</u>. Although they have not been prioritised for meeting biodiversity targets, they are still an important part of the natural ecosystem. ONAs should be managed or utilised in a manner that minimises habitat and species loss and ensures ecosystem functionality through strategic landscape planning. These 'other natural areas' offer considerable flexibility in terms of management objectives and permissible land uses, but some authorisation may still be required for high impact land uses.

The Western Cape Biodiversity Spatial Plan guidelines specify the following for Other Natural Areas for Urban development and expansion:

'*Minimise habitat and species loss and ensure ecosystem functionality through strategic landscape planning. Offers flexibility in permissible land uses, but some authorisation may still be required for high-impact land uses.'*

- These areas have the greatest flexibility in terms of management objectives and permissible land uses.
- Where possible, avoid modifying any remaining natural habitat by locating land uses, including cultivation and plantations, in already-modified areas.
- Authorisation may be required for high-impact land uses (such as intensive industry or urban development) and standard application of EIA regulations and other planning procedures is required.

These areas may still contain species of conservation concern but either have not yet been surveyed, or the data was not available for incorporation into the WCBSP. The *presence or absence of species of conservation concern* should always be established through site visits before proceeding with a land use change. *Recommendations of an appropriately qualified specialist must be followed in this regard.*

Existing settlements and urban expansion

Includes: Metropolitan areas, cities, larger towns, small towns, villages and hamlets. Assumes the following conditions/controls:

- The control of urban expansion through the delineation of an urban edge to prevent urban sprawl.
- The delineation process is guided by the provincial urban edge guideline document and informed by the Western Cape Biodiversity Spatial Plan, for example: a Critical Biodiversity Area Map is used to delineate a boundary of the urban edge.
- The promotion of compact urban settlements, whilst maintaining an open space system (where possible) that is informed by a fine-scale biodiversity plan or map.

Implications: A small portion of Other Natural Area is identified within the site.

- *The site is located directly adjacent to an existing urban area.*
- *The vegetation type is well conserved regionally and has a widespread distribution.*
- *The vegetation on site is comprised of a mozaic of near-natural, degraded and transformed vegetation with some alien infestation (predominantly Pine).*
- *The vegetation on site has a low species diversity compared to surrounding areas.*
- *Species of Conservation Concern are generally absent from the site and thus has a low potential contribution to conservation.*

Retention of a buffer around the drainage lines as well as the north-eastern portion (Ecological Support Area) as Open Space as well as the overall development of a 'compact urban settlements, whilst maintaining an open space system' thus means that the proposed development is possible whilst meeting the guideline recommendations.

Severely Modified to No Natural Remaining (NNR)

Areas that have been modified by human activity to the extent that they are no longer natural, and do not contribute to biodiversity targets. These areas may still provide limited biodiversity and ecological infrastructure functions, even if they are never prioritised for conservation action. These areas offer the most flexibility for land use, but these should be managed in a biodiversity-sensitive manner, aiming to maximise ecological functionality. Authorisation is still required for high-impact land uses.

Implications: None present on site.

1.5.4 Garden Route Biodiversity Sector Plan

Roodefontein Grassy Fynbos is the only fynbos unit within the site and the water drainage system present is known as the Groot Brak River and Floodplain.

Groot Brak River and floodplain

Two vegetation units are recognised in this habitat, despite their overall similarity in vegetation present. The more western Groot Brak River and floodplain unit seems to have a more punctuated flooding regime resulting in a wider floodplain zone, usually with fewer forest patches in the upper region. The more eastern Tsitsikamma River and floodplain unit occurs in a generally higher rainfall zone with high rainfall events more frequently and thus the drainage channels more clearly defined. No rare or endangered plant species are known from these units, but uncommon species such as *Watsonia galpinii* occurs within the flood zone of the Tsitsikamma River and floodplain unit.

Implications: The Groot Brak River and Floodplain represented on site is highly modified and comprised mostly of ruderal and other weeds. It is recommended that the small portion of Groot Brak River and Floodplain along the north-eastern boundary is retained as open space and an alien clearing and rehabilitation plan be implemented.

Roodefontein Grassy Fynbos

Perhaps the most species rich and floristically interesting Grassy Fynbos unit is the Roodefontein Grassy Fynbos. It differs from all the other units in having *Leucadendron eucalyptifolium* and *Protea mundii* often abundant along drainage areas. The uncommon narrow-leaved variant of *Protea cynaroides* also occurs sporadically on moist south-facing slopes. Many small seasonal wetlands are also present in this unit. These sites are indicated by an abundance of *Cliffortia linearifolia*, often along with an abundance of *Stenotaphrum secundatum*. This unit is rich in geophyte species, usually with many *Watsonia knysnana* present, but also several orchid species (especially *Satyrium* species). Restios (especially *Restio triticeus*) are quite abundant and Cyperaceae less common than in other units. Ericoid shrubs (especially *Erica formosa, Erica sessiliflora*, *Erica sparsa* and *Erica versicolor*) are usually abundant. An interesting feature is the presence of several species that reach their westernmost distribution here, e.g. *Dierama pendula* and *Kniphofia praecox*. We suspect that the long-lost *Cyclopia laxiflora* occur(ed) in this unit

Implications: Although some of the species typical of the unit were found to be present, species richness is deemed to be low compared to surrounding areas. A flora search and rescue can be implanted before construction to relocate the few individuals of species of conservation concern that are present.

1.6 Vegetation and Ecological Processes

Fynbos is a **fire-adapted** vegetation that requires regular burning for its persistence. In the absence of fire, fynbos is gradually replaced by thicket species. It thrives on infertile soils and fire is the mechanism that recycles precious nutrients from old moribund growth into the soil. Fire in fynbos is far from a disaster, but rather a crucial trigger that resets the fynbos 'successional clock'. It provides the stimulus for dormant seeds to germinate and the opportunity for many annuals, short-lived perennials and bulbs to grow, flower and seed during times of abundant nutrients and sunlight. They complete their short life cycles, returning to the soil as the larger shrubs overwhelm them, and remain dormant until the next fire. The optimal fire cycle for fynbos is between 10-14 years. Shorter fire cycles can wipe out slow maturing species, while species start dying when intervals become too long.

One of the characteristic features of Fynbos is that it is a fire-dependent ecosystem and the organisms that inhabit Fynbos are adapted to periodic fires e.g. serotiny, whereby plants only release their seeds after a fire. The Fynbos Biome can be further divided into three main vegetation complexes based on the soil substrate and rainfall, namely

Fynbos, Renosterveld and Strandveld (Mucina & Rutherford 2006). The Fynbos Biome contains high levels of diversity and endemism, particularly plants, at various taxonomic levels. At the high taxonomic level of family, there are four plant families which are endemic to the Fynbos Biome, namely Geissolomataceae, Grubbiaceae, Roridulaceae and Penaeaceae (Manning 2007)

All fynbos types require periodic fires to stimulate recruitment and to retain maximum species richness. The different fynbos types do, however, differ vastly in terms of appropriate fire frequency.
Non-sprouting Proteas are the best indicators of an appropriate fire frequency, which should allow at least 50% of these Protea plants to have flowered three times before they are burned again. The maximum interval between fires should not exceed the active reproductive period of these plants.
Fire season is also vital to retain species richness, with late summer and autumn fires (December/April) giving the best recruitment results. Fire intensity is also important, with only 'clean' burns acceptable, where no fine material or unburned leaves remain after a fire.

The last important aspect is the size of the fire, where block burns should preferably not be smaller than 100 ha (ideally 200-500 ha) in size. To ensure successful recruitment after a fire, grazing by domestic stock (or large numbers of game) should not be allowed within the first two years after a fire.
Block burns in areas where two or more different vegetation types co-occur, e.g. Limestone Fynbos, Sand Fynbos or Dune Thicket, will need special planning. The fire frequency of the fastest growing vegetation unit (e.g. Sand Fynbos) is usually the most appropriate, but then only part of the slower growing vegetation types (e.g. Limestone Fynbos) should burn. Such 'patchy' burns will retain the natural fire frequency of the other units present. Fire season and size would, however, not differ from those noted above.
Block burns in areas that are heavily infested by woody alien plants (e.g. *Acacia cyclops*) will also need special planning. Where high fuel loads are present the sites may have to be burned under cool, moist conditions.
It is best to obtain specialist advice from CapeNature or a fynbos ecologist before implementing managed burns.

1.7 Implications of Systematic Planning frameworks

- The site is located directly adjacent to an existing urban area.
- The vegetation type is well conserved regionally and has a widespread distribution (0.02 % of total vegetation type coverage).
- The vegetation on site is comprised of a mozaic of near-natural, degraded and transformed vegetation with some alien infestation (predominantly Pine).
- The vegetation on site has a low species diversity compared to surrounding areas.
- Species of Conservation Concern are generally absent from the site and thus has a low potential contribution to conservation.
- Loss of vegetation cover and flora will be localised and have a minimal impact at a regional level.
- The impact of the proposed development is unlikely to have a significant negative impact on ecological processes occurring at a regional or localised level.
- The implementation of best practice guidelines (as per the EMP) will most likely be effective management to minimise any negative consequences in localised sensitive areas.
- ***Retention of a buffer around the drainage lines as well as the north-eastern portion (Ecological Support Area) as Open Space as well as the overall development of a 'compact urban settlements, whilst maintaining an open space system' thus means that the proposed development is possible whilst meeting the regional planning guideline recommendations.***

1.8 List of Maps

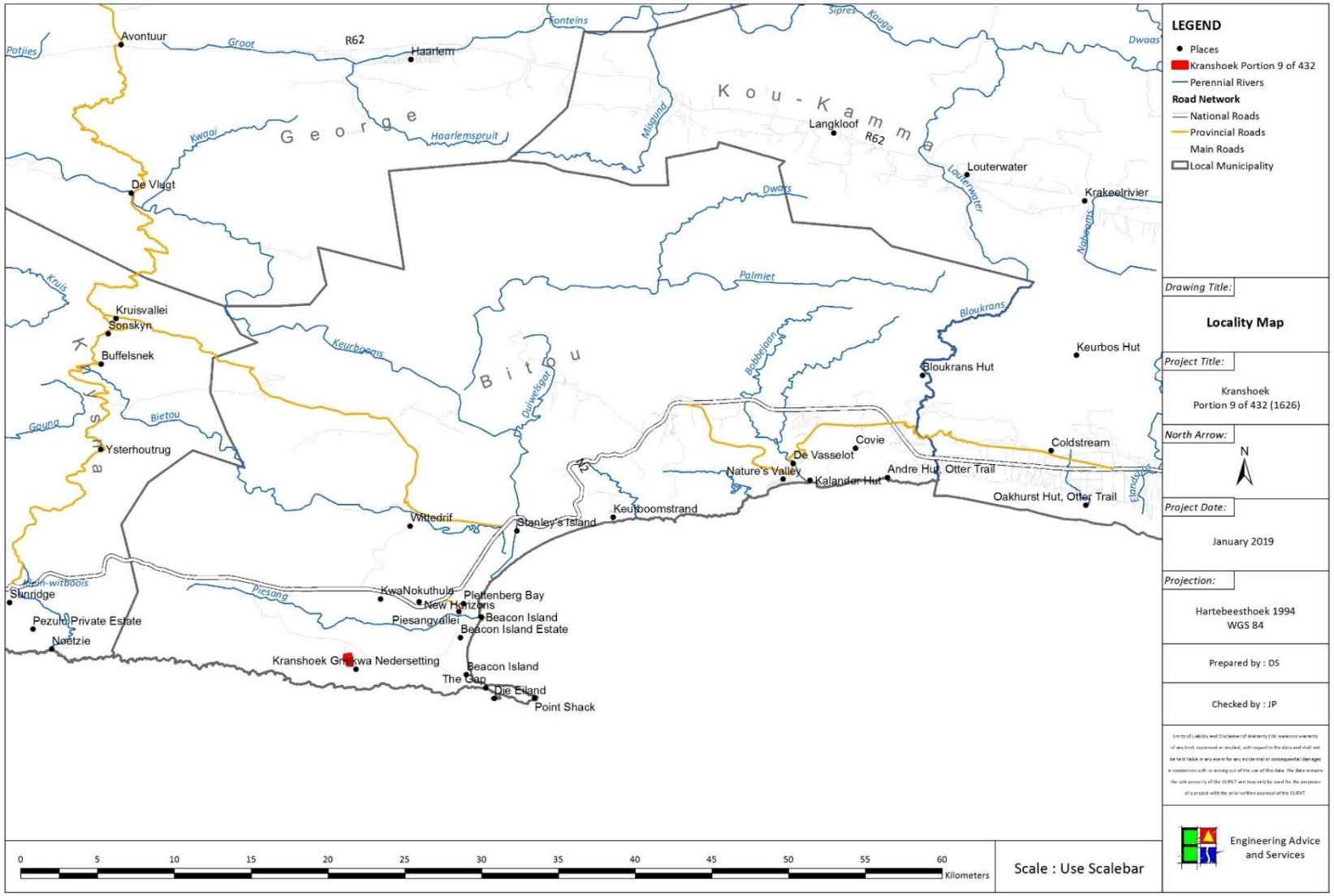


Figure 3: Locality Map

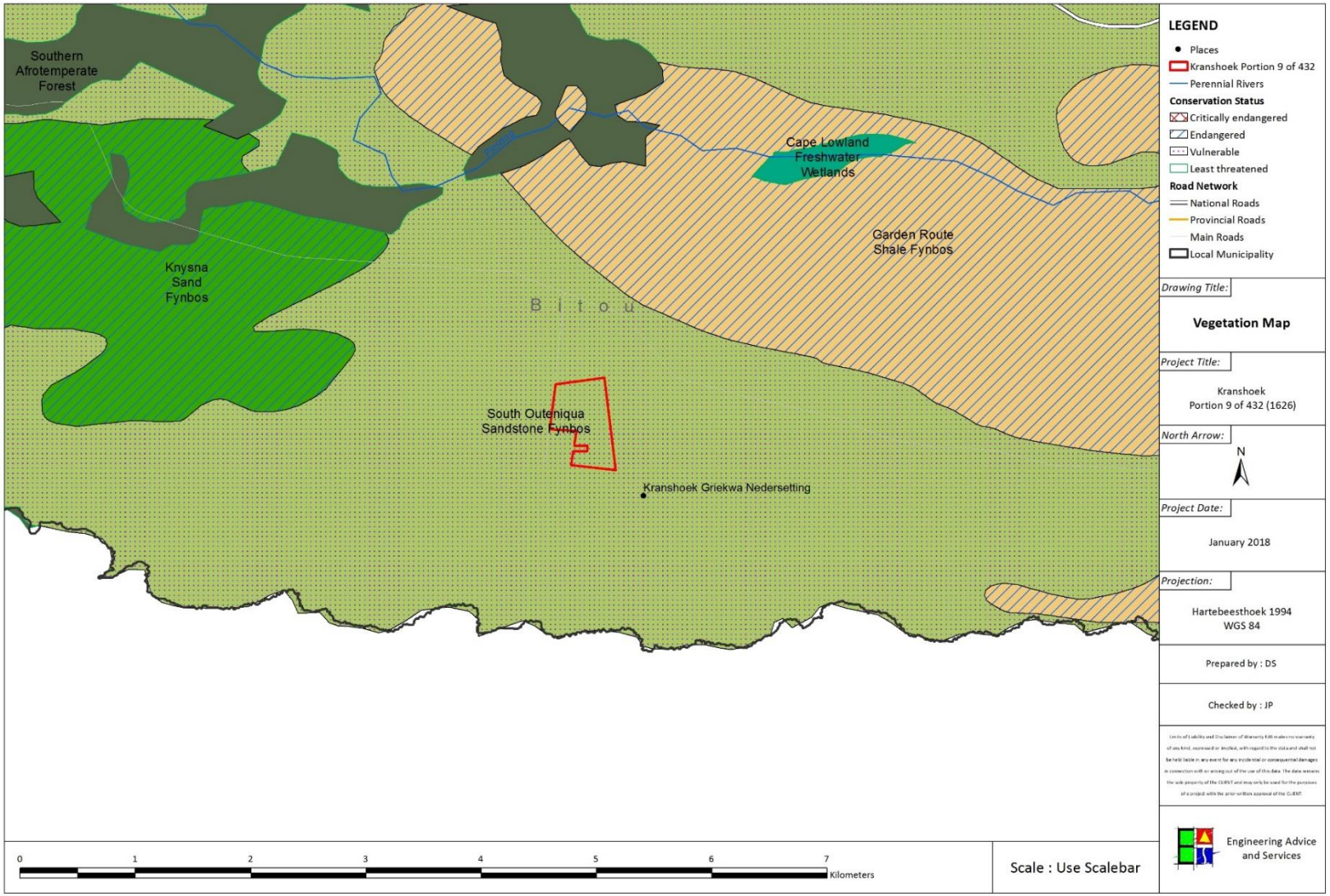


Figure 4: Vegetation Map (VegMap)

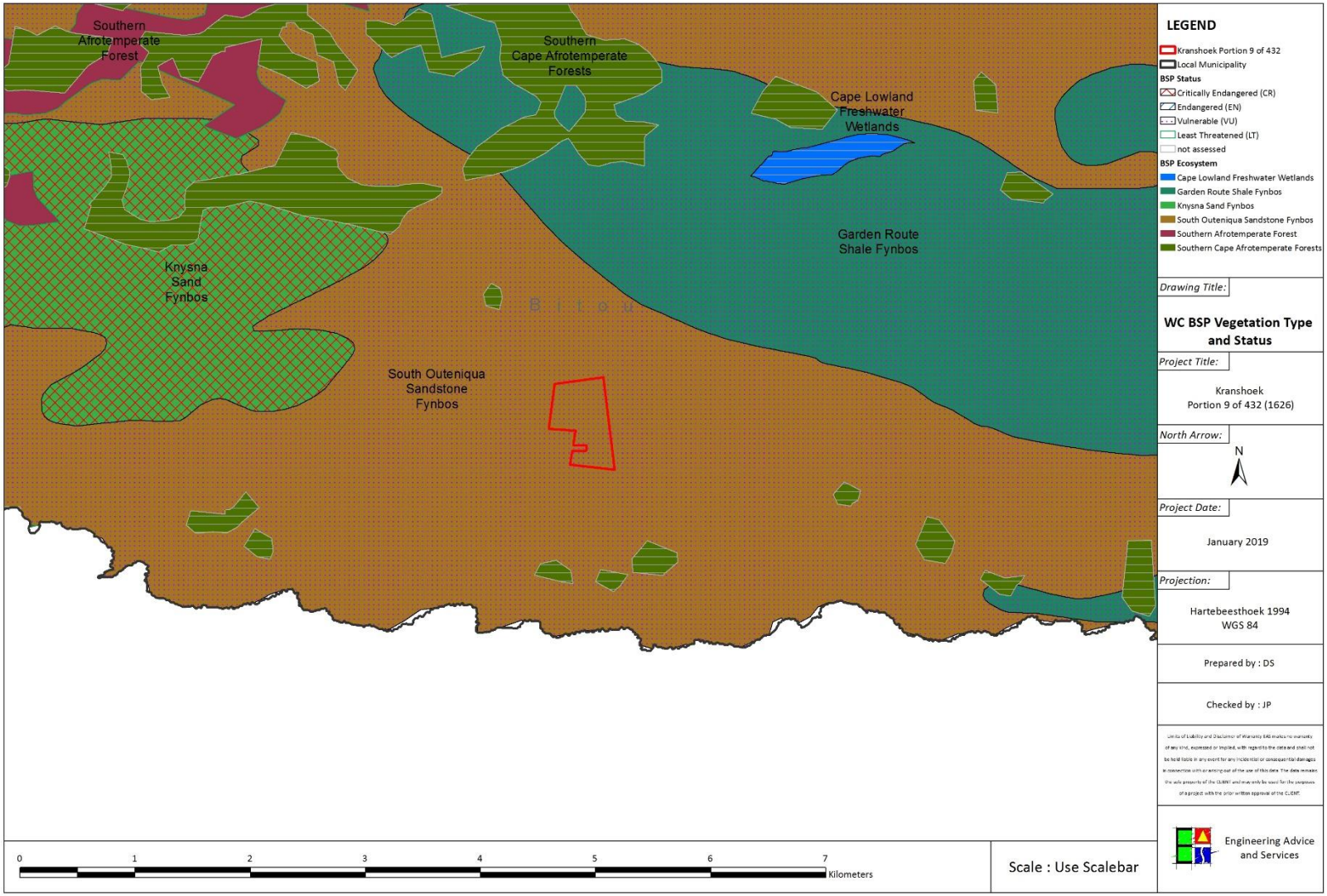


Figure 5: WC BSP Vegetation Type and Status

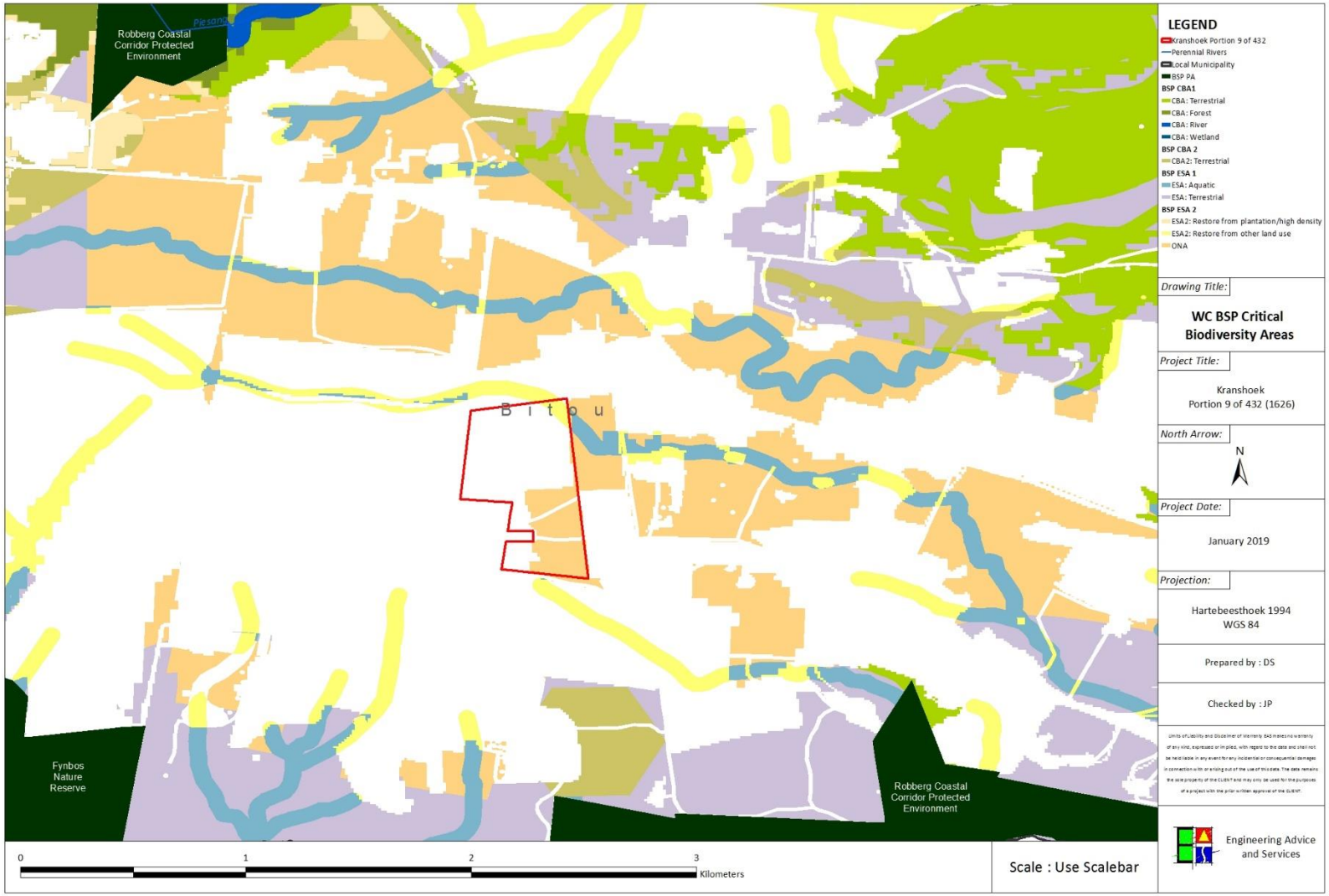


Figure 6: WC BSP Critical Biodiversity Areas

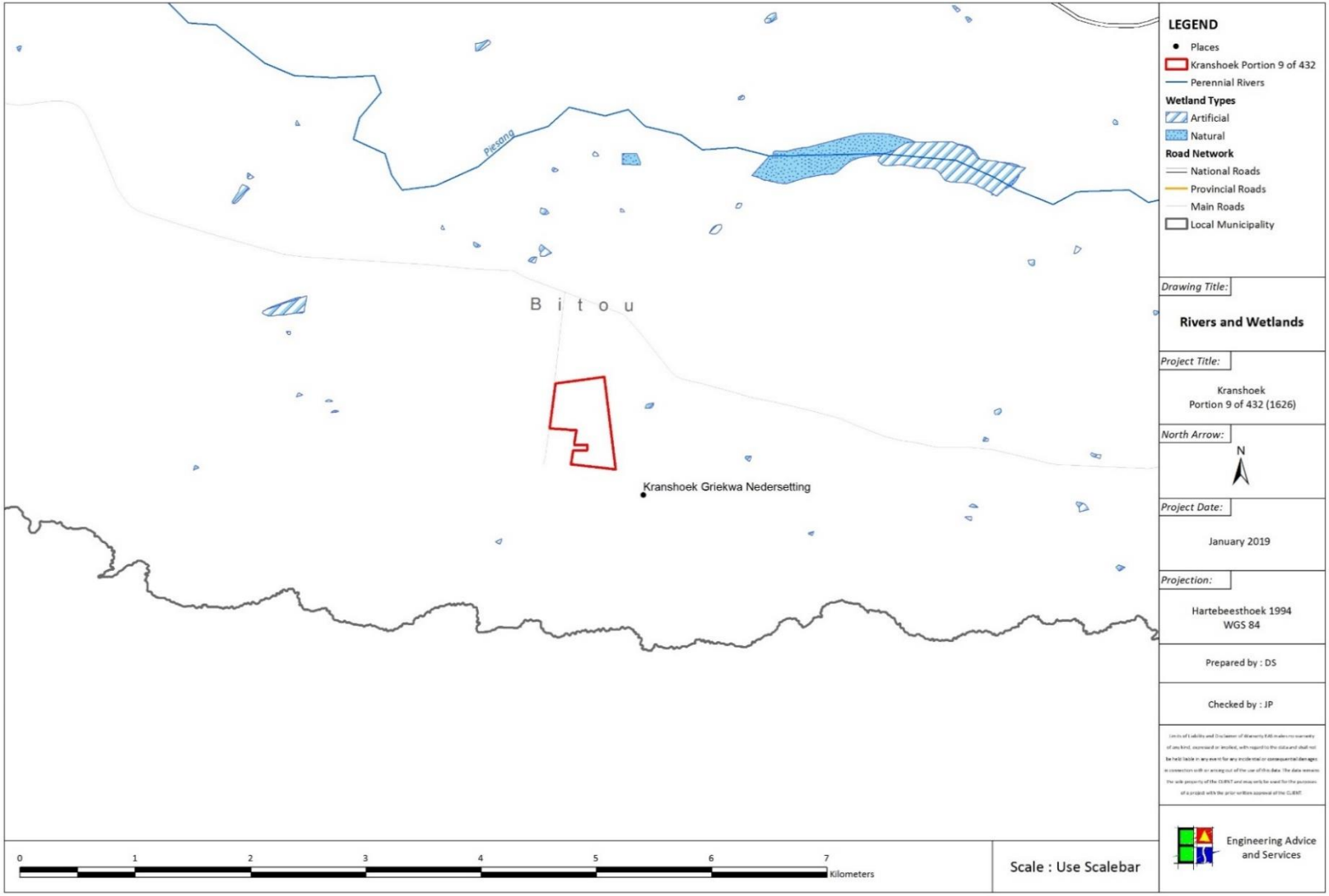


Figure 7: Rivers and Wetlands

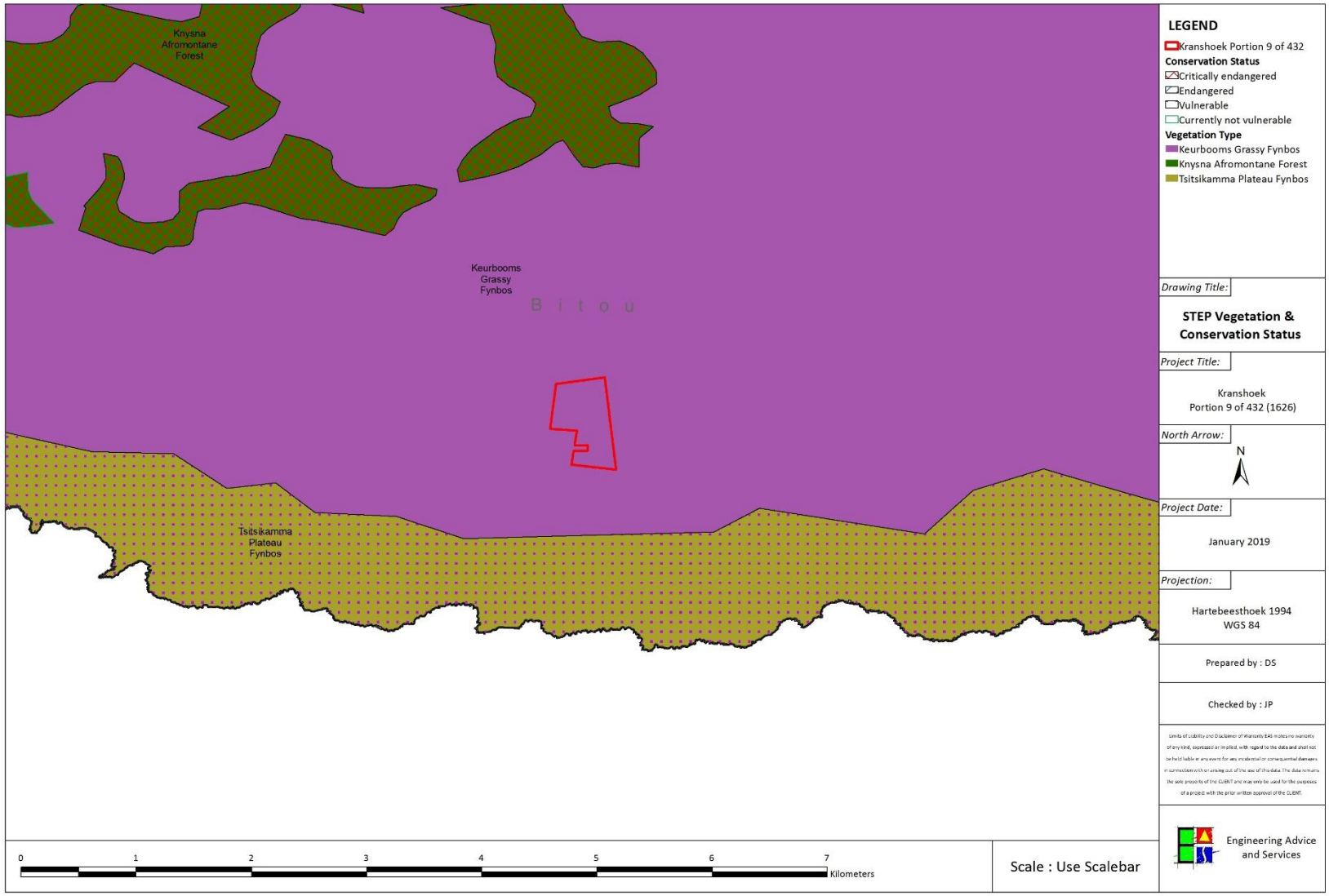


Figure 8: STEP Vegetation and conservation Status

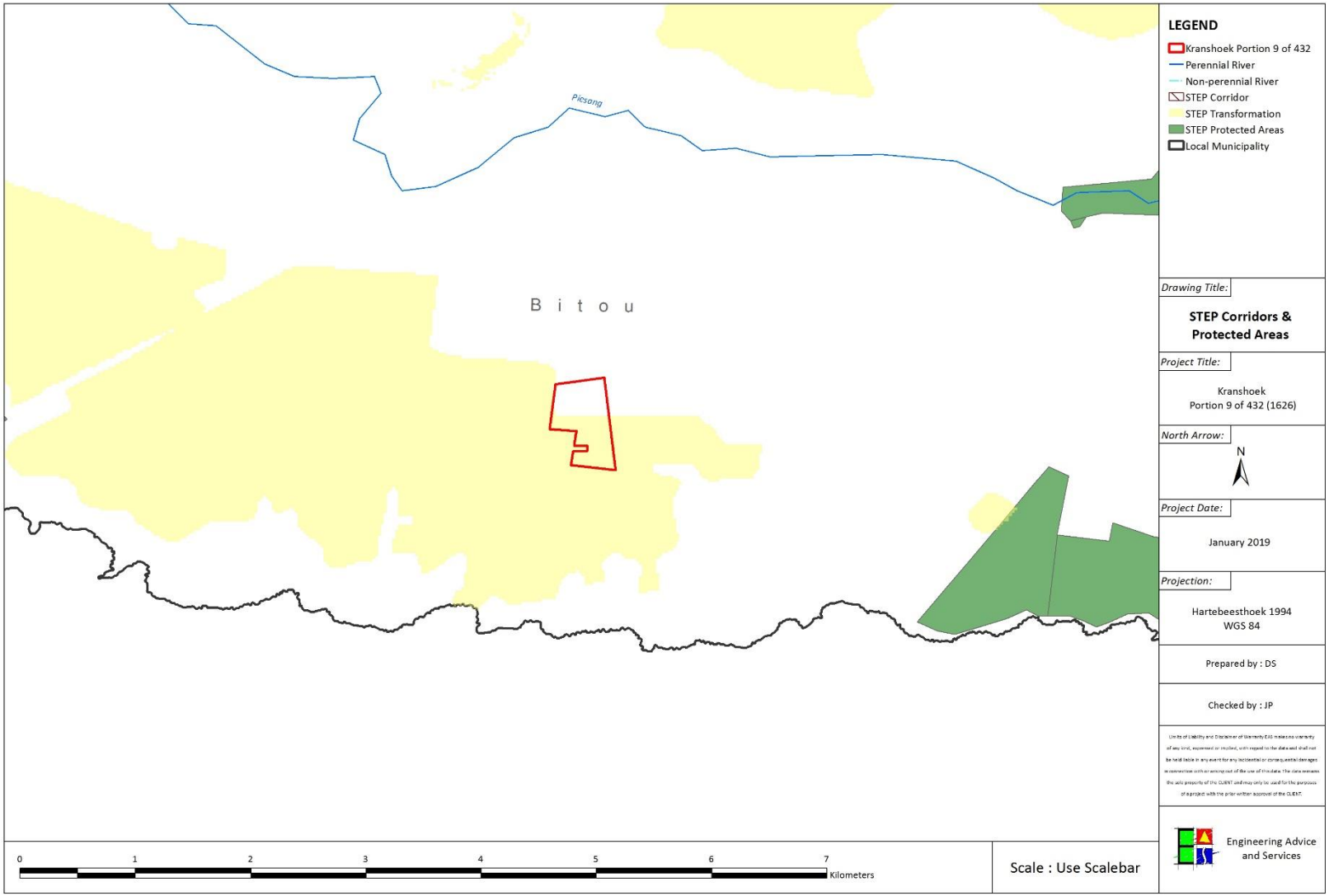


Figure 9: STEP Corridors and Protected Areas

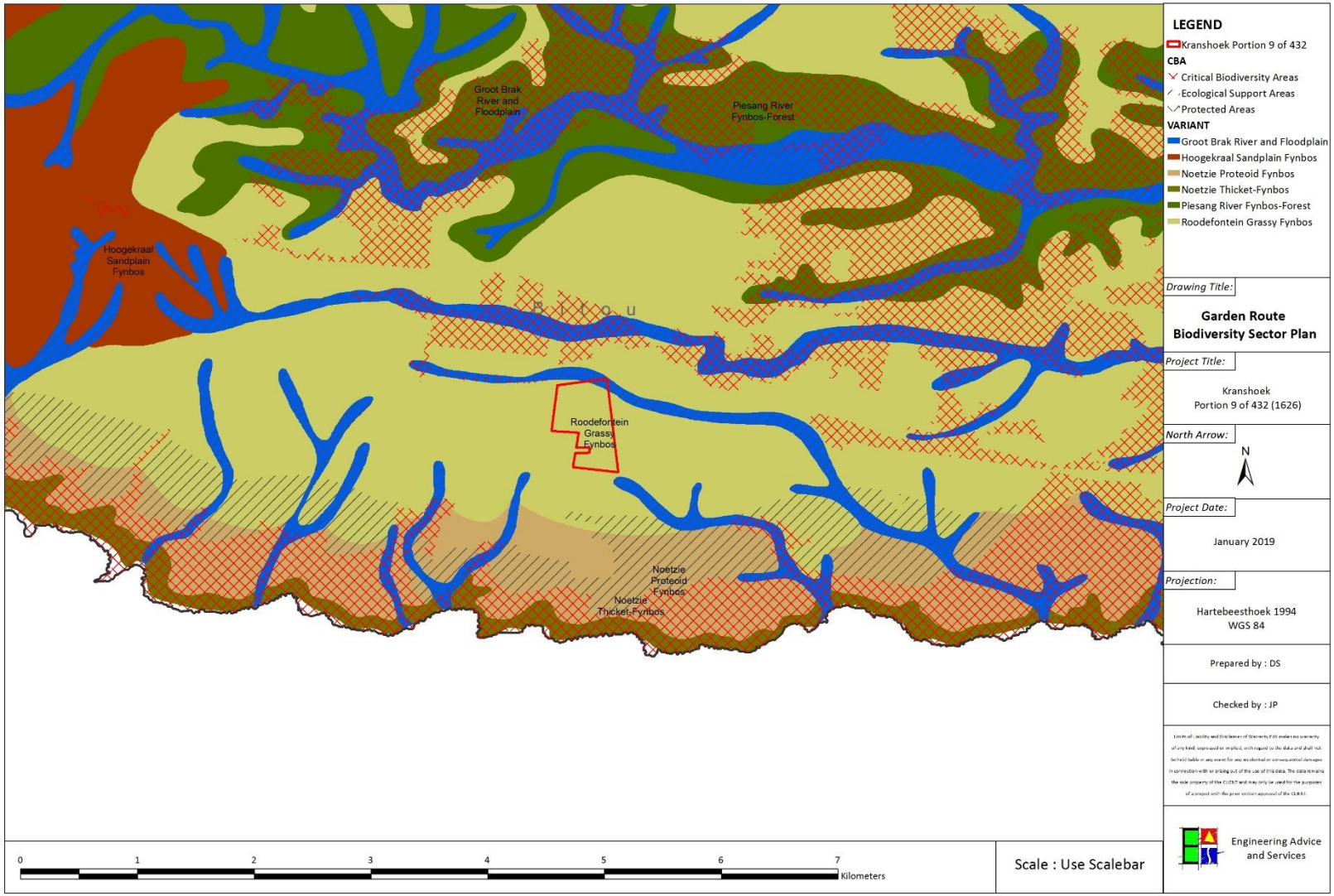


Figure 10: Garden Route Biodiversity Sector Plan

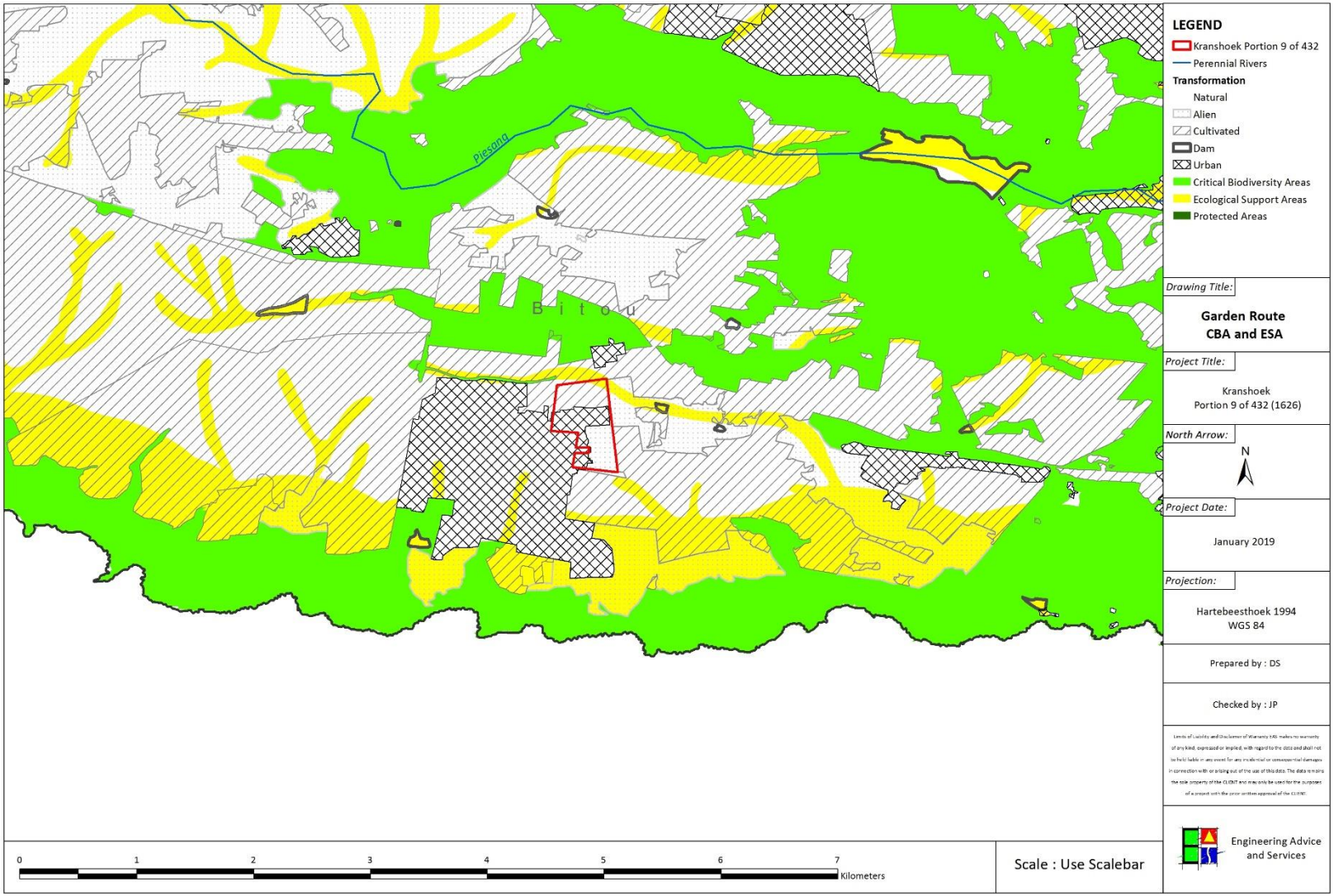


Figure 11: Garden Route CBA and ESA

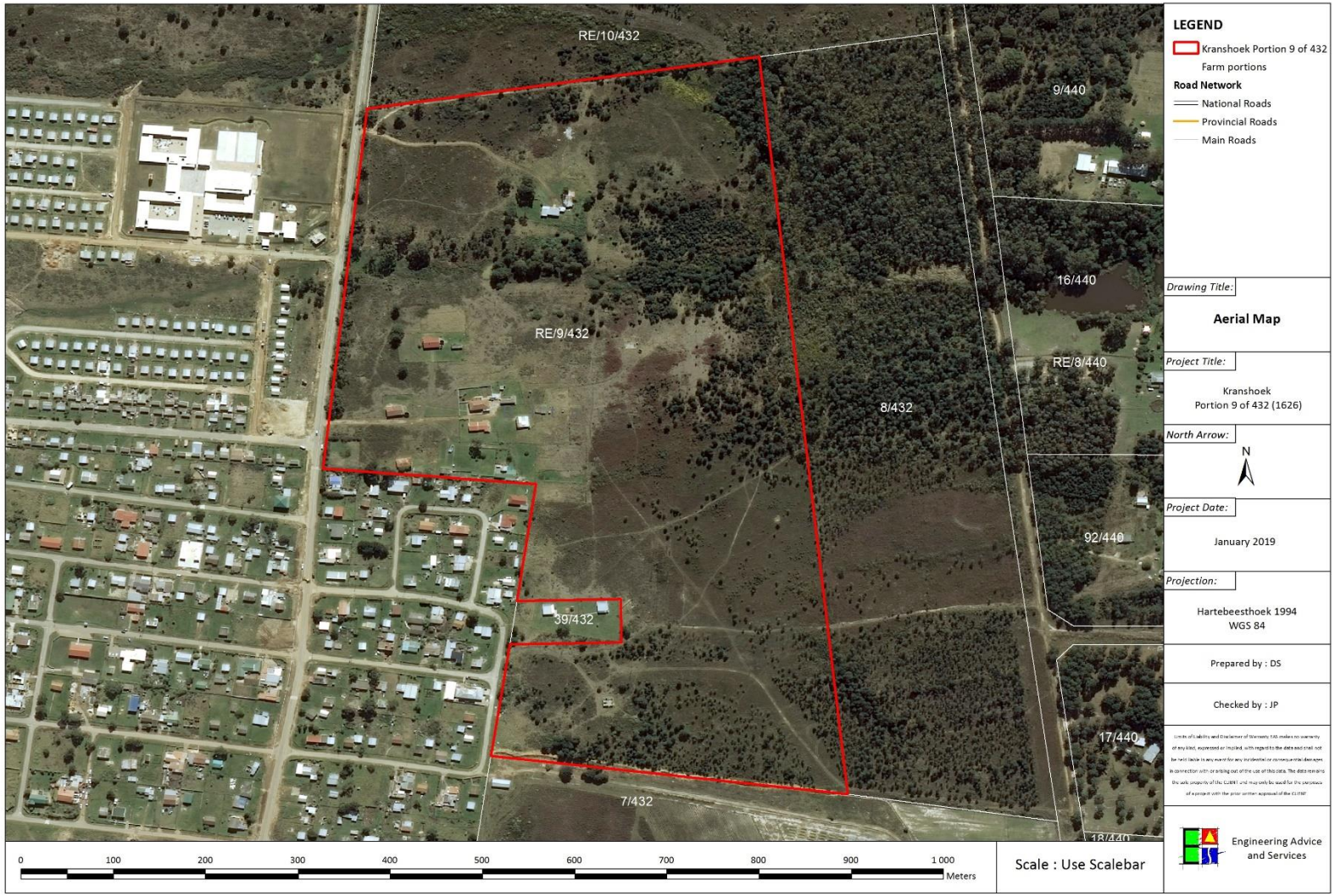


Figure 12: Aerial Photo

2 Description of the Terrestrial Environment

2.1 Site Locality

The location of the proposed site is shown in Figure 3. The site is located south of the Piesang River, and west of the Plettenberg Bay Airport. It is situated adjacent to Kranshoek Gnekwa Nedersetting.

2.2 Topography and Drainage

The area can generally be described as moderately flat with a gentle gradient towards the drainage lines. There is evidence of standing water indicating lack of drainage after heavy rainfalls. Drainage of the area is predominantly in an easterly direction.

2.3 Vegetation and Flora

2.3.1 Summary of Terrestrial vegetation

Table 2: Summary of the Terrestrial Vegetation

Feature	Implication
Topography and drainage	
The site is generally flat sloping towards the east along the drainage lines.	Suitable for development, stormwater management will require assessment.
Vegetation	
Low to high alien infestation and areas with intact and semi-intact vegetation. Approximately 60 % (14.7 Ha) of the site has contiguous natural vegetation typical of the vegetation unit (Refer to Figure 13). The remaining 40 % of the site is comprised of degraded, heavily invaded and transformed vegetation.	Invaded areas are ideally most suitable for construction of residential development but due to the location within urban areas and surrounded on 3 sides by residential erven and a road on the fourth, the conservation value is limited.
Flora	
Some protected species were noted to be present, but all commonly occurring species with widespread distribution or not of significant concern.	Permits will be required for removal (including species belonging to the Proteaceae, Ericaceae, Orchidaceae and Iridaceae families)
Forest	
No forest elements present	N/A
Trees	
No protected trees are present	N/A
Drainage Lines and Rivers/Watercourses	
Three drainage lines present on site. A distinct drainage line flowing across the site is highly invaded and degraded as a result of invasive and weed species. Two minor drainage lines are also present - along the north-eastern corner, which is heavily invaded and another drainage line in the south-eastern corner without a clearly defined channel.	A 32 m buffer from the edge of the main drainage line must be accommodated and should be cleared of alien and weed species and rehabilitated. The small drainage line along the north-eastern boundary should be incorporated into open space and cleared of alien invasive trees. The minor drainage line in the south should be incorporated into open space and used for stormwater retention.
Wetlands	
Some evidence of wetland plant species within drainage line (including small dam). A number of small excavated 'dams' were noted, but these may be present due to leaking sewerage and water infrastructure and are also used for dumping of refuse.	N/A

Feature	Implication
Alien Invasive Species	
Predominantly *Pinus pinaster* (Pine), with *Acacia mearnsii* (Black Wattle), *Acacia saligna* (Port Jackson), *Eucalyptus* spp. (Bluegum) and *Acacia melanoxylon* (Australian Blackwood) in low to dense (along eastern boundary and drainage line) infestation. Various ruderal weeds as well as exotic and indigenous grasses also in abundance for approximately 25 % (6 Ha) of the site, specifically surrounding the watercourse. Indications are that the site has become invaded over the last few years, possibly with a series of intense fires, which are likely to have affected the natural seed bank and ecology.	Areas that have low alien infestation generally have normal ecological functioning, however the heavily invaded areas (along the eastern boundary and along the drainage line) have experienced significant changes to ecological functioning. Should the site be cleared of aliens, the heavily invaded areas would most likely regenerate to a limited extent, but is unlikely to attain a completely pre-disturbance state.
Fauna	
The habitat on-site will provide transient habitat for some small mobile mammals, birds, reptiles and amphibians, but will be limited in densely invaded areas. A non-perennial drainage line and small dam is likely to **provide habitat to amphibians.**	Faunal species are most likely to be common transient species and no Species of Conservation Concern are likely to be present permanently. During construction a faunal search and recue should be conducted before commencement. Mobile mammals and reptiles are likely to move away from the site during construction.

2.3.2 Vegetation and Flora Sensitivity Assessment

The Fynbos biome occurs in the winter rainfall region of the Eastern, Western and Northern Cape and consists of three main vegetation types. Proper Fynbos is an evergreen, small-leaved shrubland characterised structurally by the presence of members of the Restionaceae, Proteaceae and Ericaceae families, and is distinguished floristically from other southern African biomes by having large numbers of species belonging to Rutaceae, Polygalaceae, Thymelaeaceae, Rhamnaceae, Rosaceae and Lobeliaceae (Gibbs with roughly 80% being endemic (Gibbs Russell 1987). It occurs on leached, infertile soil. Fynbos is fire-driven with many of its species requiring fire to germinate, resulting in seedling establishment only occurring during a short period after a fire (Cowling et al. 1997). While it has a low resistance to disturbance, it has a high resilience and recovers relatively quickly.

The majority of species are small shrubs and restios of the families Iridaceae, Proteaceae and Asteraceae with scattered alien species such as *Pinus pinaster*. It occurs in the winter rainfall regions of the Eastern part of Western Cape, where rainfall is high.

Roodefontein Grassy Fynbos

Roodefontein Grassy Fynbos is distinguished by having *Leucadendron eucalyptifolium* and *Protea mundii* often abundant along drainage areas. However, *Protea mundii* was not noted on the site, since the drainage line is heavily invaded and transformed. The uncommon narrow-leaved variant of *Protea cynaroides* common to the vegetation unit was also noted to be absent. Small seasonal wetlands are noted to be a feature of this unit, often with an abundance of *Cliffortia linearifolia*, often along with an abundance of *Stenotaphrum secundatum*. *Cliffortia linearifolia* was noted to be present. Although the site was noted to be relatively flat and likely to have a perched water table after rains, no specific wetlands or wetland indicator species were noted outside of drainage lines.

This unit is known to be rich in geophyte species, including *Watsonia knysnana*, as well as several orchid species (especially *Satyrium* species). Restios (especially *Restio triticeus*) are quite abundant and Cyperaceae less common than in other units. Ericoid shrubs (especially *Erica formosa*, *Erica sessiliflora*, *Erica sparsa* and *Erica versicolor*) are usually abundant.

Common and dominant flora species noted to be present within the site include *Cliffortia linearifolia, Restio triticeus, Bobartia orientalis, Chrysanthemoides monilifera, Diospyros dichrophylla, Erica formosa, Erica sessiliflora, Erica sparsa, Erica versicolor, Leucadendron conicum, Leucadendron eucalyptifolium, Centella affinis, Restio triticeus, Searsia lucida, Watsonia knysnana, Watsonia fourcadei, Helichrysum spp., Restio fourcadei, Senecio spp., Chironia sp., Ficinia gracilis, Hypoxis hemerocallidea, Lobelia tomentosa, Metalasia densa, Pteridium aquilinum, Stenotaphrum secundatum* and *Themeda triandra*.

Within the site, a number of distinct vegetation communities can be identified and are briefly described below (refer to Figure 13).

1. Shrubby Fynbos
2. Restioid Fynbos
3. Riparian
4. Invaded
5. Transformed

Shrubby Fynbos

A shrubby community is present notably dominated by shrubby species including *Cliffortia linearifolia, Leucadendron eucalyptifolium, Leucadendron conicum, Chrysanthemoides monilifera, Searsia lucida, Erica* spp. and *Bobartia orientalis. Watsonia knysnana* also present.

Restioid Fynbos

A restioid community is present and noted to be the dominant type, with restioid species including *Restio triticeus, Restio triticeus, Restio fourcadei, Bobartia orientalis, Watsonia* spp., *Hypoxis hemerocallidea* and *Stenotaphrum secundatum*. The Restioid fynbos generally had a significantly lower vegetation cover with more bare ground visible 40 – 60 %).

Riparian

Although a distinct drainage line is visible, riparian vegetation is highly invaded with alien invasive trees and exotic and other ruderal weeds. A few pockets of indigenous riparian species (such as *Cyperus textilis* and *Zantedeschia aethiopica*) are present and the aquatic plant *Nymphaea nouchali* was noted on a small dam within the drainage line.

Invaded

Predominantly *Pinus pinaster* (Pine), with *Acacia mearnsii* (Black Wattle*), Acacia saligna* (Port Jackson), *Eucalyptus* spp. (Bluegum) and *Acacia melanoxylon* (Australian Blackwood) in low to dense (along eastern boundary and drainage line) infestation. Various ruderal weeds as well as exotic and indigenous grasses also in abundance, specifically surrounding the watercourse. Indigenous species within Invade area include *Chrysanthemoides monilifera, Bobartia orientalis, Diospyros dichrophylla, Searsia lucida, Pteridium aquilinum, Helichrysum and Senecio* spp.

Transformed

Generally, areas that have been transformed for old residences and often have various introduced plants. Grasses include *Stenotaphrum secundatum, Pennisetum clandestinum* (Kikuyu) and other grasses.

2.3.3 Flora

Field sampling was undertaken during a limited time period and certain annual species may have been omitted. However, it was noted that species diversity within the site is low compared to surrounding areas. A comprehensive list of flora is provided in Appendix D.

2.3.4 Fauna

No faunal species were noted during the site visit. A comprehensive list of potential fauna, based on the desktop assessment is provided in Appendix D.

2.3.5 Species of Conservation Concern occurring in the region

Based on a desktop Assessment of existing online databases as well as field verification, the potential list of flora and fauna species that may occur in the vicinity of the development, is quite extensive. After a site visit however, it was found that species diversity is low compared to surrounding areas.

Table 3 provides a detailed list of species protected in term of the P.N.C.O. and NFA, for which permits may be required should they occur. Due to limited sampling time, presence or absence of all species cannot be confirmed without detailed seasonal site visits, but the risk of any Critically Endangered or Endangered species being present is deemed to be Low.

Implications: The proposed expansion and disturbance during construction of the site is thus unlikely to result in any significant impact to species conservation.

Indigenous Species of Conservation Concern.

Table 3: Indigenous Species of Conservation Concern noted to be present

Botanical Name	Family	Status**	Pres	Comment
Bobartia orientalis	IRIDACEAE	PNCO	Y	Few scattered clumps
Erica formosa	ERICACEAE	PNCO	Y	Widespread
Erica sessiliflora	ERICACEAE	PNCO	Y	Widespread
Erica sparsa	ERICACEAE	PNCO	Y	Widespread
Erica versicolor	ERICACEAE	PNCO	Y	Widespread
Hypoxis hemerocallidea	HYPOXIDACEAE	PNCO	Y	Few scattered clumps
Leucadendron conicum	PROTEACEAE	PNCO	Y	Widespread
Leucadendron eucalyptifolium	PROTEACEAE	PNCO	Y	Widespread
Restio fourcadei	RESTIONACEAE	PNCO	Y	Widespread
Restio triticeus	RESTIONACEAE	PNCO	Y	Widespread
Restio triticeus	RESTIONACEAE	PNCO	Y	Widespread
Watsonia fourcadei	IRIDACEAE	PNCO	Y	Few scattered individuals
Watsonia knysnana	IRIDACEAE	PNCO	Y	Widespread

**PNCO – Provincial Nature Conservation Ordinance (19 of 1974); NFA – National Forests Act; End - Endemic

The plant Species of Conservation Concern listed above require permits if any individuals are to be removed, translocated or pruned according to the relevant legislation including Provincial Nature Conservation Ordinance well as Threatened and Protected Species (T.o.P.S.).

2.3.6 Obtaining permission for the destruction, relocation and/or removal of protected flora and fauna species

It is recommended that before the clearing of the proposed site is authorized, the appropriate permission be obtained from the Western Cape Department of Environmental Affairs (DEA&DP) for the destruction of species protected by the Cape Nature Conservation Ordinance of 1974. In order to obtain permission to remove or destroy species occurring under the Provincial Nature Conservation Ordinance of 1974 a letter needs to be drafted and sent to DEA&DP together with a species list, a site map and the necessary application form. This letter must list the species

that will be removed or destroyed and the reason for their removal or destruction. These permits may be subject to certain conditions, for example allowing various nurseries to collect plants before vegetation clearance commences; the removal of certain species for rehabilitation purposes etc. These conditions will be drafted after the application has been received by DEA&DP and a site visit has been undertaken. All individuals of the protected indigenous species should firstly be avoided if possible, if not then secondly relocated or utilized during rehabilitation and landscaping. If this is not possible permits will be required to either trim or remove individuals. All of the indigenous species of concern are suitable for landscaping purposes, particularly the succulents.

2.4 Invasive Flora

A number of invasive alien species were found to occur within the site. It is recommended that they are removed to prevent spread into adjacent areas.

Table 4: Invasive Flora found within the sites.

Botanical Name	Common name	Family	Category	Extent
Acacia mearnsii	Black wattle	FABACEAE	CARA 2	Scattered
Acacia melanoxylon	Australian Blackwood	FABACEAE	CARA 2	Scattered
Acacia saligna	Port Jackson	FABACEAE	CARA 2	Scattered
Cirsium vulgare	Scotch Thistle	ASTERACEAE	CARA 1	Scattered
Eucalyptus sp.	Gum Tree	MYRTACEAE	CARA 2	Scattered
Pinus pinaster	Cluster Pine	PINACEAE	CARA 2	Scattered

2.5 Terrestrial Habitat Sensitivity Assessment

An overall sensitivity assessment (Figure 13) was made to include relative conservation and ecological importance of the vegetation communities, presence of indigenous Species of Conservation Concern (SCC's) and extent of invasion, as well as the degree to which successful rehabilitation can take place.

- Areas scoring a low sensitivity are those areas that are degraded or transformed or is unlikely that they could be rehabilitated to a normal functioning state without extreme effort and expense. *This includes the portions of the site that are invaded by aliens or areas containing old residences with gardens.*
- Areas of moderate (medium) sensitivity are those areas that contain a reasonably intact habitat and intact ecological functioning. *Within the site, this comprises the intact vegetation.*
- Areas scoring a high sensitivity on site are those having an important ecological function, having specialized habitats, significant populations of Species of Conservation Concern. *In this case the Ecological Process areas (Riparian vegetation) and watercourses have been given a high sensitivity*.

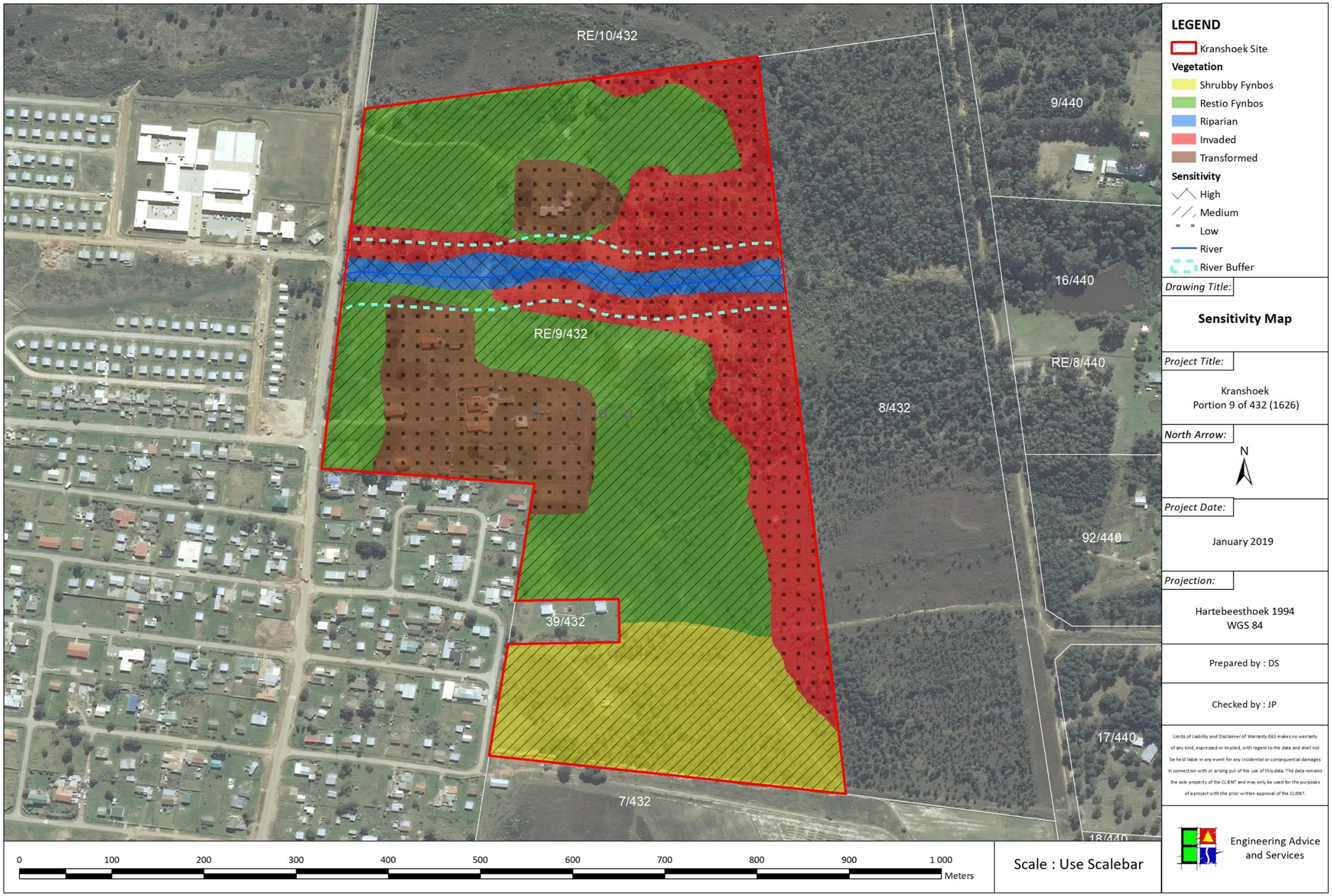


Figure 13: Sensitivity and Vegetation Cover Map

3 Impact Assessment

3.1 Assessment of the significance of the potential impacts

3.1.1 Criteria of assigning significance to potential impacts

The following methodology is to be applied in the specialist studies for the assessment of potential impacts.

Criteria	Explanation
Nature of impact	Review the type of effect that a proposed activity will have on the environment and should include "what will be affected and how?"
Extent	Indicate whether the impact will be: • *(S) local* and limited to the immediate area of development (the site); • (L) limited to within 5 km of the development; or • (R) whether the impact may be realized regionally, nationally or even internationally.
Duration	Review the lifetime of the impact, as being: • *(V) very short term* (0 - 1 years), • *(S) short term* (1 - 5 years), • (M) medium (5 - 15 years), • *(L) long term* (>15 years but where the impacts will cease after the operation of the site), or • *(P) permanent*.
Intensity	Establish whether the impact is destructive or innocuous and should be described as either: • *(L) low* (where no environmental functions and processes are affected) • *(M) medium* (where the environment continues to function but in a modified manner) or • *(H) high* (where environmental functions and processes are altered such that they temporarily or permanently cease).
Probability	Consider the likelihood of the impact occurring and should be described as: • *(I) improbable* (low likelihood) • *(P) probable* (distinct possibility) • *(H) highly probable* (most likely) or • *(D) definite* (impact will occur regardless of prevention measures).
Status of the impact	Description as to whether the impact will be positive (a benefit), negative (a cost), or neutral.
Degree of confidence	The degree of confidence in the predictions, based on the availability of information and specialist knowledge. This should be assessed as high, medium or low.
Significance	• *(L) Low:* Where the impact will not have an influence on the decision or require to be significantly accommodated in the project design • *(M) Medium*: Where it could have an influence on the environment which will require modification of the project design or alternative mitigation; • *(H) High*: Where it could have a 'no-go' implication for the project unless mitigation or re-design is practically achievable.

3.1.2 Significance Rating

		Duration				
		Permanent	**Long term**	**Medium term**	**Short term**	**Very short term**
	High Intensity					
Extent	**National**	High	High	High	High	Medium
	Regional	High	High	High	High	Medium
	Local	High	High	Medium	Medium	Medium
	Site specific	Medium	Medium	Medium	Medium	Medium
	Medium Intensity					
Extent	**National**	High	High	High	Medium	Medium
	Regional	High	High	High	Medium	Medium
	Local	Medium	Medium	Medium	Medium	Medium
	Site specific	Medium	Medium	Medium	Medium	Low
	Low Intensity					
Extent	**National**	Medium	Medium	Medium	Medium	Medium
	Regional	Medium	Medium	Medium	Medium	Medium
	Local	Medium	Medium	Medium	Medium	Low
	Site specific	Medium	Medium	Medium	Low	Low

Furthermore, the following must be considered:

1) Impacts should be described both before and after the proposed mitigation and management measures have been implemented.
2) All impacts should be evaluated for both the construction, operation and decommissioning phases of the project, where relevant.
3) The impact evaluation should take into consideration the cumulative effects associated with this and other facilities which are either developed or in the process of being developed in the region, if relevant.
4) Management actions: Where negative impacts are identified, specialists must specify practical mitigation objectives (i.e. ways of avoiding or reducing negative impacts). Where no mitigation is feasible, this should be stated and the reasons given. Where positive impacts are identified, management actions to enhance the benefit must also be recommended.

3.2 Identification of potential impacts

3.2.1 Possible impacts on biodiversity during construction and operations

Construction and operations can result in a range of negative impacts on terrestrial, marine and other aquatic ecosystems if not properly managed. Table 5 describes impacts that may potentially occur in the site (as per DEDEAT guidelines) as well indicating the relevant EMP section. The predicted significance of these are summarised in Table 5, where **SB** = Significance BEFORE mitigation and **SA** = Significance AFTER mitigation. No significant ancillary linear infrastructure, such as roads, conveyors, power lines, pipelines and railways, which can impact on biodiversity and ecosystem services are expected other than minor access roads.

3.2.2 Summary of actions, activities, or processes that have sufficiently significant impacts to require mitigation

The main impacts as a result of the proposed activity include the following:

1. Permanent or temporary loss of vegetation cover as a result of site clearing. Site clearing before construction will result in the blanket clearing of vegetation within the affected footprint.
2. Loss of Species of Conservation Concern during pre-construction site clearing activities. Numerous Species of Conservation Concern are present within the affected area, which will be destroyed during site preparation.
3. Susceptibility of some areas to erosion as a result of construction related disturbances. Removal of vegetation cover and soil disturbance may result in some areas being susceptible to soil erosion after completion of the activity.
4. Susceptibility of post construction disturbed areas to invasion by exotic and alien species. Post construction disturbed areas having no vegetation cover are often susceptible to invasion by weedy and alien species, which can not only become invasive but also prevent natural flora from becoming established.
5. Disturbances to ecological processes. Activity may result in disturbances to ecological processes.
6. Loss of Faunal Habitat: Activity will result in the loss of habitat for faunal species.
7. Loss of faunal SCC due to construction activities: Activities associated with bush clearing and ploughing, killing of perceived dangerous fauna, may lead to increased mortalities among faunal species.

3.2.3 Potential cumulative impacts

No cumulative impacts are expected as a result of the development of the site, due to the limited disturbance area.

3.2.4 Status quo

Under *status quo* conditions (No-Go option) it is likely that large portions of the site will continue to undergo alien invasion, with associated increase in fire, as well as ongoing degradation of the site (including illegal dumping). It is likely that the site would continue on a trajectory of ongoing degradation, without intervention.

*Table 5: Summary indicating significance of potential impacts (**SB = Significance BEFORE Mitigation; SA = Significance AFTER Mitigation**)*

Impact	Comment	Extent	Duration	Intensity	Probability	SB	SA
Vegetation loss	Permanent or temporary loss of vegetation cover as a result of site clearing	Site	Long	High	Definite	Moderate	Low
Flora Species	Loss of Species of Conservation Concern during pre-construction site clearing activities	Site	Long	Moderate	Definite	Moderate	Low
Erosion	Susceptibility of some areas to erosion as a result of construction related disturbances	Site	Med	Low	Probable	Low	Negligible
Alien species	Susceptibility of post construction disturbed areas to invasion by exotic and alien species	Site	Med	Moderate	Probable	Moderate	Low
Ecological Processes	Disturbances to ecological processes	Site	Short	Moderate	Probable	Moderate	Low
Faunal Habitat	Activity will result in the loss of habitat for faunal species	Site	Long	Moderate	Definite	Moderate	Low
Faunal Species	Activities associated with bush clearing and ploughing, killing of perceived dangerous fauna, may lead to increased mortalities among faunal species	Site	Long	Low	Probable	Moderate	Low
OVERALL						**Moderate**	**Low**

4 Mitigation and Management

The following mitigation measures are recommended:

Impact	Mitigation Measures
Vegetation	• Blanket clearing of vegetation must be limited to the approved development footprint, and the area to be cleared must be demarcated before any clearing and grubbing commences. • No clearing outside of development and infrastructure footprint area to take place. • Final siting of footprint should be undertaken in consultation with respective specialists, including a botanist. • Open Space to be incorporated in final plan to include ecological corridors and riparian as described in the report. • Removed topsoil should be used in rehabilitation of transformed areas that are within the open space areas.
Flora	• Respective permits must be obtained timeously (2 - 3 months) before site clearing commences and a flora search and rescue plan must be implemented beforehand. • Permits from DEA&DP must be kept on site and in the possession of the flora search and rescue team at all times. • Rescued plants should be replanted into a nearby disturbed area of similar habitat or for open space rehabilitation. • Once flora search and rescue is complete, a certificate of clearance must be issued by the botanist and copies supplied to DEA&DP
Alien species	• Alien plants must be removed from the site as per NEMBA requirements. • A suitable weed management strategy to be implemented in construction and operation phases to eradicate and control regeneration. • After any clearing is completed, an appropriate cover crop should be planted where any weeds or exotic species are removed from disturbed areas timeously.
Erosion	• Suitable measures must be implemented in areas that may be susceptible to erosion, including but not limited to gabions and runoff diversion berms (if necessary). • Areas must be rehabilitated and a suitable cover crop planted once specific phases of construction is completed. • If site development does not occur soon after preparation of the site, a suitable cover crop to be established as a temporary measure.
Ecological Processes	• Blanket clearing of vegetation must be limited to the development footprint, and the area to be cleared must be demarcated before any clearing commences. • No clearing outside of development and infrastructure footprints to take place. • Open Space to be incorporated in final plan to include ecological corridors and riparian as described in the report.
Faunal Habitat	• Blanket clearing of vegetation must be limited to the approved development footprint, and the area to be cleared must be demarcated before any clearing commences • Open Space to be incorporated in final plan to include ecological corridors and riparian as described in the report. • Open Space rehabilitation and removal of invasives should commence before site clearing commences.
Faunal Species	• Respective permits must be obtained timeously (2 - 3 months) before site clearing commences and a fauna search and rescue plan must be implemented beforehand. • Permits from DEA&DP must be kept on site and in the possession of the fauna search and rescue team at all times. • Rescued fauna should be released into a nearby area of similar habitat away from any construction. • Once fauna search and rescue is complete, a certificate of clearance must be issued by the animal handler and copies supplied to DEA&DP

4.1 Fauna and Flora Clearing and Relocation Plan

The following flora relocation plan is recommended:

1. Once the final site development plan has been determined the botanist will be consulted in order to finalise the plant relocation and vegetation clearing plan.
2. Areas to be cleared of vegetation will be clearly demarcated before clearing commences.
3. Flora search and rescue is to be conducted before vegetation clearing takes place.
4. Plants to be rescued should include both Species of Conservation Concern requiring removal for relocation as well as species that would be suitable for use in rehabilitation and that are amenable to transplanting.
5. Faunal search and rescue to also be conducted by a qualified animal handler.
6. Areas should only be stripped of vegetation as and when required and in particular once Species of Conservation Concern (fauna and flora) have been relocated for that area.
7. Once site boundaries are demarcated, the area to be cleared of vegetation will be surveyed by the flora and fauna search and rescue team clearing under the supervision of the botanist and animal handler to identify and remove species suitable for rescue and commence removal of plants.
8. Depending on growth form this material should be appropriately removed from its locality and immediately relocated where it may be required elsewhere or into adjacent areas of similar habitat that will not be disturbed by construction.
9. Small trees and shrubs (<1 m in height), where possible will be rescued and planted temporarily in potting bags for later use.
10. Wherever possible, any seed-bearing material will be collected immediately and stored for later use, particularly species that occur in low numbers or those that will be well-suited for rehabilitation.
11. Protected flora and fauna species will be removed from the site prior to development taking place. A suitable timeframe must be allowed before construction commences (minimum 1 month) to undertake the rescue and relocation operation. Search and Rescue is best undertaken during Spring/early Summer.
12. Should site construction occur in a phased manner, then clearing activities should take place also in a phased manner, ahead of construction work.
13. Rescued plants will be replanted directly into a suitable adjacent area, and will include some non-protected succulent species that will help support the protected species.
14. Rescued fauna to be removed from site and released in an area of similar habitat away from the site and where no construction is taking place in the vicinity.
15. Succulent species can be temporarily stored for no more than 2 weeks in a suitable area before replanting. The contractor will be responsible for periodic watering of the replanted flora until such time as they become acclimatised and some rain occurs.

5 Conclusions

The clearing of vegetation from the proposed site to establish the proposed residential development will result in the localised loss of vegetation cover as well as the potential destruction of a few Species of Conservation Concern (fauna and flora), within the affected footprints. The impacts will be confined to the construction footprint, having a limited area. In addition, any Species of Conservation Concern that are present have widespread distributions, and any losses are unlikely to result in any significant impacts to populations after the implementation of a fauna and flora search and rescue plan.

Although the site is generally flat, the clearing of vegetation to establish a residential area may also result in a temporary increase in erosion and erosion risk in some areas of the site during construction. Adequate measures must be implemented to stabilise areas having an erosion risk using appropriate means as necessary, including contouring and cut off drains. Any areas outside of the proposed development footprint that are disturbed during vegetation clearing are likely to regenerate naturally. Should any problematic areas be identified after completion, additional measures may be necessary to establish plant growth. Measures should be implemented to eradicate any weeds and invasive species that may regenerate after disturbance.

These impacts of the proposed residential development to terrestrial vegetation, flora and fauna are likely to be of low to negligible significance with the implementation of the recommended mitigation measures. Impacts noted in this assessment report are likely to have low to negligible residual impacts if mitigation measures are implemented. The proposed activity is somewhat reversible during the early stages, however once hardened surfaces are constructed reversibility will be low.

Under *status quo* conditions (No-Go option) it is likely that large portions of the site will continue to undergo alien invasion, with associated increase in fire, as well as ongoing degradation of the site (including illegal dumping). It is likely that the site would continue on a trajectory of ongoing degradation, without intervention.

6 Appendix A: Environmental Management Plan

This Environmental Management Plan (EMP) contains guidelines, operating procedures and rehabilitation control requirements, which will be binding on the holder of the environmental authorisation after approval of the EMP.

The impacts identified and listed in Table 1 of the previous chapter will be managed / controlled as set out under mitigating measures and as detailed in this part for the more significant impacts during the operational phase.

6.1 Biodiversity Requirements

Protection of Flora and Fauna

- Search and rescue operations for Red List Species ***must*** be undertaken before the commencement of site clearing activities.
- Indigenous vegetation encountered on the sites are to be conserved and left intact.
- It is important that clearing activities are kept to the minimum and take place in a phased manner. This allows animal species to move into safe areas and prevents wind and water erosion of the cleared areas.
- Stripped vegetation ***should*** be temporarily stored during operations and to be used later to stabilise slopes. This excludes exotic invasive species.
- No animals are to be harmed or killed during the course of operations.
- Workers are NOT allowed to collect any flora or snare any faunal species. All flora and fauna remain the property of the land owner and ***must*** not be disturbed, upset or used without their expressed consent.
- It is the responsibility of the Contractor to provide sufficient fuel for cooking and heated as needed by the staff.
- No domestic animals are permitted on the sites.
- Trees and shrubs that are directly affected by the operations may be felled or cleared but only by the expressed written permission of the ECO.
- Weeds and alien species ***must*** be cleared by hand before the rehabilitation phase of the areas. Removal of alien plants are to be done according to the Working for Water Guidelines.
- The Contractor is responsible for the removal of alien species within all areas disturbed during construction activities. Disturbed areas include (but are not limited to) access roads, construction camps, site areas and temporary storage areas.
- In consultation with relevant authorities, the Engineer my order the removal of alien plants (when necessary). Areas within the confines of the site are to be included.
- All alien plant material (including brushwood and seeds) should be removed from site and disposed of at a registered waste disposal site. Should brushwood be utilised for soil stabilization or mulching, it must be seed free.
- Rehabilitation of vegetation of the site ***must*** be done as described in the Rehabilitation Plans.

Fires

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

- The Contractor ***must*** supply all living quarters, site offices, kitchen areas, workshop areas, materials, stores and any other relevant areas with tested and approved fire-fighting equipment.
- Fires and "hot work" ***must*** be restricted to demarcated areas.
- A braai facility may be considered at the discretion of the Contractor and in consultation with the ECO. The area ***must*** be away from flammable stores. All events must be under management's supervision and a fire extinguisher ***will*** be immediately available. "Low-smoke" fuels must be used (e.g. charcoal) and smoke control regulations, if applicable, must be considered.
- The Contractor ***must*** take precautions when working with welding or grinding equipment near potential sources of combustion. Such precautions include having a suitable, tested and approved fire extinguisher immediately at hand and the use of welding curtains.

Soil Aspects

- Sufficient topsoil must be stored for later use during decommissioning, particularly from outcrop areas.
- Topsoil shall be removed from all areas where physical disturbance of the surface will occur.
- All available topsoil shall be removed after consultation with the botanist and horticulturalist prior to commencement of any operations.
- The removed topsoil shall be stored on high ground within the site footprint outside the 1:50 flood level within demarcated areas.
- Topsoil shall be kept separate from overburden and shall not be used for building or maintenance of roads.
- The stockpiled topsoil shall be protected from being blown away or being eroded. The application of a suitable grass seed/runner mix will facilitate this and reduce the minimise weeds.

Dust

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

6.1.1 Infrastructural Requirements

Topsoil

- Topsoil shall be removed from all areas where physical disturbance of the surface will occur.
- All available topsoil shall be removed after consultation with the Regional Manager prior to commencement of any operations.
- The removed topsoil shall be stored on high ground within the footprint outside the 1:50 flood level within demarcated areas.
- Topsoil shall be kept separate from overburden and shall not be used for building or maintenance of roads.
- The stockpiled topsoil shall be protected from being blown away or being eroded. The use of a suitable grass seed/runner mix will facilitate soil protection and minimise weeds/weed growth.

Stormwater and Erosion Control

- Stormwater Management Plans ***must*** be developed for the site and ***should*** include the following:
    - The management of stormwater during construction.
    - The installation of stormwater and erosion control infrastructure.
    - The management of infrastructure after completion of construction.

- Temporary drainage works may be required to prevent stormwater to prevent silt laden surface water from draining into river systems in proximity to the site. Stormwater ***must*** be prevented from entering or running off site.
- To ensure that site are not subjected to excessive erosion and capable of drainage runoff with minimum risk of scour, their slopes ***should*** be profiled at a maximum 1:3 gradient.
- Diversion channels ***should*** be constructed ahead of the open cuts, and above emplacement areas and stockpiles to intercept clean runoff and divert it around disturbed areas into the natural drainage system downstream of the site.
- Rehabilitation is necessary to control erosion and sedimentation of all eroded areas (where works will take place).
- Existing vegetation ***must*** be retained as far as possible to minimise erosion problems.
- It is importation that the rehabilitation of site are planned and completed in such a way that the runoff water will not cause erosion.
- Visual inspections ***will*** be done on a regular basis with regard to the stability of water control structure, erosion and siltation.
- Sediment-laden runoff from cleared areas ***must*** be prevented from entering rivers and streams.
- No river or surface water may be affected by silt emanating from the site.

Site Office / Camp Sites

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

Operating Procedures in the Site

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

Excavations

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

- Topsoil shall be handled as described in this EMP.
- Excavations shall take place only within the approved demarcated site.
- Excavations must follow the contour lines where possible.
- The construction site will not be left in any way to deteriorate into an unacceptable state.
- The excavated area must serve as a final depositing area for waste rock and overburden during the rehabilitation process.

- Once excavations have been filled with overburden, rocks and coarse natural materials and profiled with acceptable contours (including erosion control measures), the previous stored topsoil shall be returned to its original depth over the area.
- The area shall be fertilised if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally occurring flora.

Rehabilitation of Processing and Excavation Areas

- On completion of construction, the surface of the processing areas especially if compacted due to hauling and dumping operations shall be scarified to a depth of at least 200 mm and graded to an even surface condition and the previously stored topsoil will be returned to its original depth over the area.
- The area shall be fertilised if necessary to allow vegetation to establish rapidly. The site shall be seeded with suitable grasses and local indigenous seed mix.
- Excavations may be used for the dumping of construction wastes. This ***shall*** be done in such a way as to aid rehabilitation.
- Waste (non-biodegradable refuse) will not be permitted to be deposited in the excavations.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the activity, be corrected and the area be seeded with a vegetation seed mix to his or her satisfaction. This ***must*** be done in conjunction with the ECO.
- Final rehabilitation ***must*** comply with the requirements mention in the Rehabilitation Plan.

6.1.2 Final Rehabilitation

Rehabilitation Objective

The overall objective of the rehabilitation plan is to minimize adverse environmental impacts associated with the activity whilst maximizing the future utilization of the property. Significant aspects to be borne in mind in this regard is visibility of the pipeline scar, revegetation of the footprint and stability and environmental risk. The depression and immediate area of the working must also be free of alien vegetation.

Additional broad rehabilitation strategies / objectives include the following:

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

Topsoil and Subsoil Replacement

Topsoil and subsoil will be stripped separately from the pipeline trench. The topsoil and subsoil removed from the initial cut will be stockpiled separately and only used in rehabilitation work towards the end of the operation. This is in contract to the gravel activity where rehabilitation and topsoil replacement was earmarked at the completion of each phase.

Stripped overburden will be backfilled into the worked-out areas where needed. Stripped topsoil will be spread over the re-profiled areas to an adequate depth to encourage plant regrowth. The vegetative cover will be stripped with the thin topsoil layer to provide organic matter to the relayed material and to ensure that the seed store contained

in the topsoil is not diminished. Reseeding may be required should the stockpiles stand for too long and be considered barren from a seed bank point of view. Stockpiles should ideally be stored for no longer than a year.

The topsoil and overburden will be keyed into the reprofiled surfaces to ensure that they are not eroded or washed away. The top-soiled surface will be left fairly rough to enhance seedling establishment, reduce water runoff and increase infiltration.

Revegetation

All prepared surfaces will be seeded with suitable grass species to provide an initial ground cover and stabilize the soil surface.

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

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

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

Drainage and Erosion Control

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

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

Visual Impacts Amelioration

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

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

6.1.3 Monitoring and Reporting

Adequate management, maintenance and monitoring will be carried out annually by the applicant to ensure successful rehabilitation of the property until a closure certificate is obtained.

To minimise adverse environmental impacts associated with operations it is intended to adopt a progressive rehabilitation programme, which will entail carrying out the proposed rehabilitation procedures concurrently with activity.

6.1.4 Closure objectives and their extent of alignment to the pre-construction environment

Closure Objectives

The closure of the site will involve removal of all debris and rehabilitation of areas not rehabilitated during the operational phases of the project. This will comprise the scarification of compacted areas, reshaping of areas, top-soiling and regenerating all prepared surfaces.

7 Appendix B: References

- Cowling, R,M, and Heijnis, C.E. 2001. Broad Habitat Units as biodiversity entities for conservation planning in the Cape Floristic Region. S. Afr. J. Bot. 67: 15-38.
- Cowling R.M., Lombard A.T., Rouget M., Kerley G.I.H., Wolf T., Sims-Castley R., Knight A., Vlok J.H.J., Pierce S.M., Boshoff A.F., Wilson, S.L. 2003. A Conservation Assessment for the Subtropical Thicket Biome. TERU Report 43. University of Port Elizabeth.
- Cowling, R.M.; Pressey, R.L.; Lombard, A.T.; Heijnis, C.E.; Richardson, D.M. and Cole, N. 1999. Framework for a conservation plan for the Cape Floristic Region. IPC Report 9902. Institute for Plant Conservation, University of Cape Town.
- De Villiers CC, Driver A, Clark B, Euston-Brown DIW, Day EG, Job N, Helme NA, Holmes PM, Brownlie S and Rebelo AB. 2005. Fynbos Forum: Ecosystem Guidelines for Environmental Assessment in the Western Cape. Fynbos Forum and Botanical Society of South Africa, Kirstenbosch.
- Golding, J. 2002. Workshop Proceedings: Revision of the national list of protected trees as per section 12, National Forests Act of 1998. Roodeplaat. Pretoria.
- Kemper, N. P. 2001. Riparian Vegetation Index. Water Research Commission.
- Klein, H. 2002. Legislation regarding harmful plants in South Africa. PPRI Leaflet Series: Weeds Biocontrol , 12, 1-4.
- Kleynhans CJ, Mackenzie J, Louw MD. 2007. Module F: Riparian Vegetation Response Assessment Index in River EcoClassification: Manual for EcoStatus Determination (version 2). Joint Water Research Commission and Department of Water Affairs and Forestry report. WRC Report No.
- Kleynhans, C. 2000. Desktop estimates of the ecological importance and sensitivity categories (EISC), default ecological management classes (DEMC), present ecological status categories (PESC), present attainable EMC (present AEMC), and best AEMC for quat. Catchments in SA. Institute for Water Quality Studies.
- Lombard, A., Wolf, T., & Cole, N. 2003. GIS coverages and spatial analysis for the Subtropical Ecosystem Planning (STEP) project. Port Elizabeth: University of Port Elizabeth.
- Low, A.B. and Rebelo, A.G. 1996. Vegetation of South Africa, Lesotho and Swaziland. Department of Environmental Affairs and Tourism, Pretoria.
- Lubke, R.A., Gess, F.W. & Bruton, M.N. 1988. A field guide to the Eastern Cape Coast. Grahamstown centre of the Wildlife Society of Southern Africa.
- Mucina, L., & Rutherford, M. 2006. The Vegetation of South Africa, Lesotho and Swaziland. Pretoria: South African Biodiversity Institute.
- Pierce, S.M. 2003. The STEP Mapbook, part of: The STEP Handbook. Integrating the natural environment into land use decisions at the municipal level: towards sustainable development. Terrestrial Ecology Research Unit Report No. 47. University of Port Elizabeth, South Africa.
- Pool-Stanvliet, R., Duffell-Canham, A., Pence, G. & Smart, R. 2017. The Western Cape Biodiversity Spatial Plan Handbook. Stellenbosch: CapeNature.
- Rutherford, M.C. and Westfall, R.H. 1994. Biomes of southern Africa: an objective categorization. National Botanical Institute, Pretoria. 94 pp.
- Stewart, W., Cowling, R., Martin, A., du Preez, D., & Lombard, A. 2004. A Biodiversity Conservation Assessment and Framework for an Open Space System for the Nelson Mandela Metropole, Cape Floristic Region, South Africa. A report of the C.A.P.E. Project for the Table Mountain Fund (WWF-SA).
- Stewart, W.I., Cowling, R.M., Du Preez, D.R., Martin, A.P. & Lombard, A.T. 2003. Framework for a Conservation Plan for the Nelson Mandela Metropole, Cape Floristic Region, South Africa, 1st Edition. Unpublished Technical Report to the Table Mountain Fund: WWF-SA.
- Victor, J.E., and Dold, A.P. 2003. Threatened plants of the Albany centre of Floristic Endemism, South Africa. SAJSci. 99:437-446.

- Vlok, H., & Euston-Brown, D. 2002. The patterns within, and the ecological processes that sustain the subtropical thicket vegetation in the planning domain for the Subtropical Thicket Ecosystem, South Africa. Port Elizabeth: University of Port Elizabeth.
- Vlok, J.H.J., Cowling, R.M. & Wolf, T., 2005. A vegetation map for the Little Karoo. Unpublished maps and report for a SKEP project supported by CEPF grant no 1064410304.

8 Appendix C: Site Photographic Record

Photo 1:

Photo 2:

Photo 3:

Photo 4:

Photo 5:

Photo 6:

Photo 7:

Photo 8:

Photo 9:

Photo 10:

Photo 11:

Photo 12:

Photo 13: Southern Section

Photo 14:

Photo 15:

Photo 16:

Photo 17:

Photo 18:

Photo 19:

Photo 20:

Photo 21:

Photo 22:

Photo 23:

Photo 24:

9 Appendix D: List of Floral & Faunal Species of Conservation Concern

FLORA

Botanical Name	Family	Status**	Pres/Abs	Growth Form
Acacia mearnsii	FABACEAE	Inv	Y	Tree
Acacia melanoxylon	FABACEAE	Inv	Y	Tree
Acacia saligna	FABACEAE	Inv	Y	Tree
Acmadenia gracilis	RUTACEAE	End, PNCO		Low Shrubs
Acmadenia maculata	RUTACEAE	PNCO		Low Shrubs
Acmadenia rupicola	RUTACEAE	End, PNCO		Low Shrubs
Acmadenia tetragona	RUTACEAE	PNCO		Low Shrubs
Agathosma alaris	RUTACEAE	End, PNCO		Low Shrubs
Agathosma planifolia	RUTACEAE	End, PNCO		Low Shrubs
Amphithalea flava	FABACEAE	End		Low Shrubs
Andropogon appendiculatus	POACEAE			Graminoids
Anginon difforme	APIACEAE			Tall Shrubs
Anisodontea scabrosa	MALVACEAE			Low Shrubs
Anthochortus ecklonii	RESTIONACEAE			Graminoids
Aspalathus angustifolia subsp. angustifolia	FABACEAE			Low Shrubs
Aspalathus bowieana	FABACEAE	End		Low Shrubs
Aspalathus ciliaris	FABACEAE			Low Shrubs
Aspalathus digitifolia	FABACEAE	End		Low Shrubs
Aspalathus rubens	FABACEAE			Low Shrubs
Berzelia intermedia	BRUNIACEAE	PNCO		Low Shrubs
Blechnum attenuatum	BLECHNACEAE			Geophytic Herbs
Bobartia orientalis	IRIDACEAE	PNCO	Y	Geophytic Herbs
Brunia nodiflora	BRUNIACEAE	PNCO		Low Shrubs
Caesia contorta	HEMEROCALLIDACEAE			Geophytic Herbs
Cannomois parviflora	RESTIONACEAE			Graminoids
Cannomois scirpoides	RESTIONACEAE			Graminoids
Cannomois virgata	RESTIONACEAE			Graminoids
Capeobolus brevicaulis	CYPERACEAE			Graminoids
Carpacoce spermacocea	RUBIACEAE			Herbs
Cassytha ciliolata	LAURACEAE			Herbaceous Parasitic Climber
Centella affinis	APIACEAE		Y	Herbs
Centella virgata	APIACEAE			Herbs
Chironia spp	GENTIANACEAE		Y	Herbs
Chrysanthemoides monilifera	ASTERACEAE		Y	Tall Shrubs
Chrysitrix capensis	CYPERACEAE			Graminoids
Cirsium vulgare	ASTERACEAE	Inv	Y	Herbs
Cliffortia ilicifolia	ROSACEAE			Low Shrubs
Cliffortia linearifolia	ROSACEAE			Low Shrubs
Cliffortia stricta	ROSACEAE		Y	Low Shrubs
Cyathocoma hexandra	CYPERACEAE			Graminoids
Cyperus textilis	CYPERACEAE		Y	Graminoids
Dichrocephala integrifolia subsp. integrifolia	ASTERACEAE			Herbs
Diospyros dichrophylla	EBENACEAE		Y	Small Tree
Dodonaea viscosa var. angustifolia	SAPINDACEAE			Tall Shrubs
Drosera trinervia	DROSERACEAE			Carnivorous Herb
Ehrharta dura	POACEAE			Graminoids
Ehrharta rupestris subsp. tricostata	POACEAE			Graminoids
Elegia fistulosa	RESTIONACEAE			Graminoids

Botanical Name	Family	Status**	Pres/Abs	Growth Form
Elegia galpinii	RESTIONACEAE			Graminoids
Elegia juncea	RESTIONACEAE			Graminoids
Epischoenus adnatus	CYPERACEAE			Graminoids
Erica aneimena	ERICACEAE	End, PNCO		Low Shrubs
Erica cordata	ERICACEAE	PNCO		Low Shrubs
Erica deflexa	ERICACEAE	PNCO		Low Shrubs
Erica densifolia	ERICACEAE	PNCO		Low Shrubs
Erica discolor	ERICACEAE	PNCO		Low Shrubs
Erica formosa	ERICACEAE	PNCO	Y	Low Shrubs
Erica fuscescens	ERICACEAE	PNCO		Low Shrubs
Erica gillii	ERICACEAE	End, PNCO		Low Shrubs
Erica glomiflora	ERICACEAE	PNCO		Low Shrubs
Erica gracilis	ERICACEAE	PNCO		Low Shrubs
Erica hispidula	ERICACEAE	PNCO		Low Shrubs
Erica inconstans	ERICACEAE	End, PNCO		Low Shrubs
Erica juniperina	ERICACEAE	End, PNCO		Low Shrubs
Erica lanata	ERICACEAE	PNCO		Low Shrubs
Erica lehmannii	ERICACEAE	End, PNCO		Low Shrubs
Erica nabea	ERICACEAE	PNCO		Low Shrubs
Erica outeniquae	ERICACEAE	End, PNCO		Low Shrubs
Erica priorii	ERICACEAE	End, PNCO		Low Shrubs
Erica sessiliflora	ERICACEAE	PNCO	Y	Small Shrub
Erica similis	ERICACEAE	PNCO		Low Shrubs
Erica simulans	ERICACEAE	PNCO		Low Shrubs
Erica sparsa	ERICACEAE	PNCO	Y	Low Shrubs
Erica triceps	ERICACEAE	PNCO		Low Shrubs
Erica uberiflora	ERICACEAE	PNCO		Low Shrubs
Erica unicolor	ERICACEAE	End, PNCO		Low Shrubs
Erica velatiflora	ERICACEAE	End, PNCO		Low Shrubs
Erica versicolor	ERICACEAE	PNCO	Y	Low Shrubs
Eucalyptus sp.	MYRTACEAE	Inv	Y	Tall Tree
Euryops pinnatipartitus	ASTERACEAE			Low Shrubs
Ficinia gracilis	CYPERACEAE		Y	Graminoids
Geissorhiza bracteata	IRIDACEAE	PNCO		Geophytic Herbs
Geissorhiza fourcadei	IRIDACEAE	PNCO		Geophytic Herbs
Geissorhiza inconspicua	IRIDACEAE	PNCO		Geophytic Herbs
Geissorhiza outeniquensis	IRIDACEAE	End, PNCO		Geophytic Herb
Hakea sericea	PROTEACEAE	Inv	Y	Tall Shrubs
Halleria lucida	SCROPHULARIACEAE			Tall Shrubs
Helichrysum felinum	ASTERACEAE			Herbs
Hypodiscus albo-aristatus	RESTIONACEAE			Graminoids
Hypodiscus aristatus	RESTIONACEAE			Graminoids
Hypodiscus striatus	RESTIONACEAE			Graminoids
Hypodiscus synchroolepis	RESTIONACEAE			Graminoids
Hypoxis hemerocallidea	HYPOXIDACEAE		Y	Graminoids
Ischyrolepis gaudichaudiana	RESTIONACEAE			Graminoids
Lachnaea diosmoides	THYMELAEACEAE			Low Shrubs
Lampranthus pauciflorus	MESEMBRYANTHEMACEAE	End, PNCO		Succulent Shrub
Lanaria lanata	LANARIACEAE			Geophytic Herbs
Laurophyllus capensis	ANACARDIACEAE			Tall Shrubs
Leucadendron comosum subsp. comosum	PROTEACEAE	PNCO		Low Shrubs
Leucadendron conicum	PROTEACEAE	PNCO	Y	Tall Shrubs
Leucadendron ericifolium	PROTEACEAE	PNCO		Low Shrubs
Leucadendron eucalyptifolium	PROTEACEAE	PNCO	Y	Tall Shrubs
Leucadendron olens	PROTEACEAE	End, PNCO		Low Shrubs
Leucadendron salignum	PROTEACEAE	PNCO		Low Shrubs

Botanical Name	Family	Status**	Pres/Abs	Growth Form
Leucadendron spissifolium subsp. fragrans	PROTEACEAE	PNCO		Low Shrubs
Leucadendron uliginosum subsp. uliginosum	PROTEACEAE	PNCO		Tall Shrubs
Leucospermum cuneiforme	PROTEACEAE	PNCO		Low Shrubs
Leucospermum glabrum	PROTEACEAE	PNCO		Tall Shrubs
Leucospermum hamatum	PROTEACEAE	End, PNCO		Low Shrubs
Leucospermum wittebergense	PROTEACEAE	PNCO		Low Shrubs
Linconia alopecuroidea	BRUNIACEAE	PNCO		Low Shrubs
Linum villosum	LINACEAE	End		Herb
Liparia hirsuta	FABACEAE			Tall Shrubs
Lobelia neglecta	LOBELIACEAE			Low Shrubs
Lobelia tomentosa	LOBELIACEAE		Y	Low Shrubs
Mairia crenata	ASTERACEAE			Herbs
Mastersiella purpurea	RESTIONACEAE			Graminoids
Merxmuellera decora	POACEAE			Graminoids
Merxmuellera rufa	POACEAE			Graminoids
Metalasia densa	ASTERACEAE		Y	Tall Shrubs
Metalasia trivialis	ASTERACEAE			Tall Shrubs
Mimetes cucullatus	PROTEACEAE	PNCO		Low Shrubs
Mimetes pauciflorus	PROTEACEAE	PNCO		Tall Shrubs
Nymphaea nouchali	NYMPHAEACEAE		Y	Aquatic
Osteospermum junceum	ASTERACEAE			Tall Shrubs
Otholobium carneum	FABACEAE			Low Shrubs
Passerina falcifolia	THYMELAEACEAE			Tall Shrubs
Penaea acutifolia	PENAEACEAE	End		Low Shrubs
Penaea cneorum subsp. cneorum	PENAEACEAE			Low Shrubs
Penaea cneorum subsp. gigantea	PENAEACEAE			Low Shrubs
Pentameris distichophylla	POACEAE			Graminoids
Pentaschistis colorata	POACEAE			Graminoids
Pentaschistis malouinensis	POACEAE			Graminoids
Pentaschistis pallida	POACEAE			Graminoids
Phaenocoma prolifera	ASTERACEAE			Low Shrubs
Phragmites australis	POACEAE		Y	Graminoids
Phylica confusa	RHAMNACEAE			Low Shrubs
Phylica curvifolia	RHAMNACEAE	End		Low Shrubs
Pinus pinaster	PINACEAE	Inv	Y	Tall Tree
Platycaulos anceps	RESTIONACEAE			Graminoids
Platycaulos compressus	RESTIONACEAE			Graminoids
Podalyria burchellii	FABACEAE		Y	Tall Shrubs
Podalyria sericea	FABACEAE			Tall Shrubs
Prismatocarpus rogersii	CAMPANULACEAE	End		Low Shrubs
Protea cynaroides	PROTEACEAE	PNCO		Low Shrubs
Protea lorifolia	PROTEACEAE	PNCO		Low Shrubs
Protea mundii	PROTEACEAE	PNCO		Tall Shrubs
Protea neriifolia	PROTEACEAE	PNCO		Tall Shrubs
Protea repens	PROTEACEAE	PNCO		Tall Shrubs
Pseudobaeckea cordata	BRUNIACEAE	PNCO		Low Shrubs
Psoralea affinis	FABACEAE			Tall Shrubs
Psoralea vlokii	FABACEAE	End		Low Shrubs
Pteridium aquilinum	DENNSTAEDTIACEAE		Y	Geophytic Herbs
Pterocelastrus tricuspidatus	CELASTRACEAE			Tall Shrubs
Relhania calycina	ASTERACEAE			Low Shrubs
Restio fourcadei	RESTIONACEAE		Y	Graminoids
Restio strictus	RESTIONACEAE			Graminoids
Rhodocoma gigantea	RESTIONACEAE			Graminoids
Romulea fibrosa	IRIDACEAE	PNCO		Geophytic Herbs

Botanical Name	Family	Status**	Pres/Abs	Growth Form
Rubus articus	ROSACEAE		Y	Tall Shrubs
Searsia lucida	ANACARDIACEAE		Y	Small Tree
Senecio glastifolius	ASTERACEAE			Low Shrubs
Staberoha aemula	RESTIONACEAE			Graminoids
Stenotaphrum secundatum	POACEAE			Graminoids
Stoebe alopecuroides	ASTERACEAE			Low Shrubs
Struthiola eckloniana	THYMELAEACEAE			Low Shrubs
Syncarpha paniculata	ASTERACEAE			Low Shrubs
Tetraria capillacea	CYPERACEAE			Graminoids
Tetraria cuspidata	CYPERACEAE			Graminoids
Tetraria fimbriolata	CYPERACEAE			Graminoids
Tetraria involucrata	CYPERACEAE			Graminoids
Tetraria microstachys	CYPERACEAE			Graminoids
Tetraria sylvatica	CYPERACEAE			Graminoids
Tetraria thermalis	CYPERACEAE			Graminoids
Tetraria ustulata	CYPERACEAE			Graminoids
Thamnochortus cinereus	RESTIONACEAE			Graminoids
Themeda triandra	POACEAE			Graminoids
Thesium virgatum	SANTALACEAE			Semiparasitic Shrub
Tritoniopsis caffra	IRIDACEAE	PNCO		Geophytic Herbs
Ursinia coronopifolia	ASTERACEAE			Low Shrubs
Ursinia scariosa subsp. scariosa	ASTERACEAE			Low Shrubs
Ursinia trifida	ASTERACEAE			Low Shrubs
Watsonia fourcadei	IRIDACEAE	PNCO	Y	Geophytic Herbs
Watsonia knysnana	IRIDACEAE	PNCO		Geophytic Herbs
Widdringtonia nodiflora	CUPRESSACEAE			Small Tree
Willdenowia teres	RESTIONACEAE			Graminoids
Xiphotheca phylicoides	FABACEAE	End		Low Shrubs
Zantedeschia aethiopica	ARACEAE		Y	Low Shrubs
Zyrphelis outeniquae	ASTERACEAE	End		Low Shrubs

**PNCO – Provincial Nature Conservation Ordinance (19 of 1974); NFA – National Forests Act; End – Endemic; Inv – Declared Invasive (CARA)

FAUNA

Scientific Name	Family	Status	Common Name
Mammals			
Raphicerus melanotis	Bovidae	Least Concern (2016)	Cape Grysbok
Atilax paludinosus	Herpestidae	Least Concern (2016)	Marsh Mongoose
Herpestes ichneumon	Herpestidae	Least Concern (2016)	Egyptian Mongoose
Herpestes pulverulentus	Herpestidae	Least Concern (2016)	Cape Gray Mongoose
Hystrix africaeaustralis	Hystricidae	Least Concern	Cape Porcupine
Tadarida aegyptiaca	Molossidae	Least Concern (2016)	Egyptian Free-tailed Bat
Acomys (Subacomys) subspinosus	Muridae	Least Concern	Cape Spiny Mouse
Grammomys dolichurus	Muridae	Least Concern (2016)	Common Grammomys
Mastomys natalensis	Muridae	Least Concern (2016)	Natal Mastomys
Mus (Nannomys) minutoides	Muridae	Least Concern	Southern African Pygmy Mouse
Mus musculus musculus	Muridae	Least concern	
Myomyscus verreauxi	Muridae	Least Concern	Verreaux's Mouse
Otomys irroratus	Muridae	Least Concern (2016)	Southern African Vlei Rat
Rhabdomys pumilio	Muridae	Least Concern (2016)	Xeric Four-striped Grass Rat
Aonyx capensis	Mustelidae	Near Threatened (2016)	African Clawless Otter
Dendromus mesomelas	Nesomyidae	Least Concern (2016)	Brants's African Climbing Mouse
Arctocephalus pusillus pusillus	Otariidae	Least Concern	
Rhinolophus sp.	Rhinolophidae		Horseshoe Bats

Scientific Name	Family	Status	Common Name
Rhinolophus clivosus	Rhinolophidae	Least Concern (2016)	Geoffroy's Horseshoe Bat
Crocidura cyanea	Soricidae	Least Concern (2016)	Reddish-gray Musk Shrew
Crocidura flavescens	Soricidae	Least Concern (2016)	Greater Red Musk Shrew
Myosorex longicaudatus	Soricidae	Endangered (2016)	Long-tailed Forest Shrew
Miniopterus fraterculus	Vespertilionidae	Least Concern (2016)	Lesser Long-fingered Bat
Miniopterus schreibersii	Vespertilionidae	Near Threatened	Schreibers's Long-fingered Bat
Neoromicia capensis	Vespertilionidae	Least Concern (2016)	Cape Serotine
Pipistrellus (Pipistrellus) hesperidus	Vespertilionidae	Least Concern	Dusky Pipistrelle
Genetta genetta	Viverridae	Least Concern (2016)	Common Genet
Genetta tigrina	Viverridae	Least Concern (2016)	Cape Genet (Cape Large-spotted Genet)
Reptiles			
Agama atra	Agamidae	Least Concern (SARCA 2014)	Southern Rock Agama
Agama hispida	Agamidae	Least Concern (SARCA 2014)	Spiny Ground Agama
Bradypodion damaranum	Chamaeleonidae	Least Concern (SARCA 2014)	Knysna Dwarf Chameleon
Bradypodion sp. (barbatulum)	Chamaeleonidae	Not Evaluated	Beardless Dwarf Chameleon
Caretta caretta	**Cheloniidae**	**Vulnerable (SARCA 2014)**	**Loggerhead Turtle**
Crotaphopeltis hotamboeia	Colubridae	Least Concern (SARCA 2014)	Red-lipped Snake
Dasypeltis scabra	Colubridae	Least Concern (SARCA 2014)	Rhombic Egg-eater
Dispholidus typus typus	Colubridae	Least Concern (SARCA 2014)	Boomslang
Philothamnus hoplogaster	Colubridae	Least Concern (SARCA 2014)	South Eastern Green Snake
Philothamnus occidentalis	Colubridae	Least Concern (SARCA 2014)	Western Natal Green Snake
Chamaesaura anguina anguina	Cordylidae	Least Concern (SARCA 2014)	Cape Grass Lizard
Cordylus cordylus	Cordylidae	Least Concern (SARCA 2014)	Cape Girdled Lizard
Ninurta coeruleopunctatus	Cordylidae	Least Concern (SARCA 2014)	Blue-spotted Girdled Lizard
Pseudocordylus microlepidotus microlepidotus	Cordylidae	Least Concern (SARCA 2014)	Cape Crag Lizard
Pseudocordylus microlepidotus subsp. ?	Cordylidae		Cape Crag Lizard (subsp. ?)
Hydrophis platurus	Elapidae	Least Concern (SARCA 2014)	Yellow-bellied Sea Snake
Afrogecko porphyreus	Gekkonidae	Least Concern (SARCA 2014)	Marbled Leaf-toed Gecko
Pachydactylus purcelli	Gekkonidae	Least Concern (SARCA 2014)	Purcell's Gecko
Tetradactylus seps	Gerrhosauridae	Least Concern (SARCA 2014)	Short-legged Seps
Tetradactylus tetradactylus	Gerrhosauridae	Least Concern (SARCA 2014)	Cape Long-tailed Seps
Nucras lalandii	Lacertidae	Least Concern (SARCA 2014)	Delalande's Sandveld Lizard
Tropidosaura gularis	Lacertidae	Least Concern (SARCA 2014)	Cape Mountain Lizard
Tropidosaura montana montana	Lacertidae		Common Mountain Lizard
Amplorhinus multimaculatus	Lamprophiidae	Least Concern (SARCA 2014)	Many-spotted Snake
Boaedon capensis	Lamprophiidae	Least Concern (SARCA 2014)	Brown House Snake
Duberria lutrix lutrix	Lamprophiidae	Least Concern (SARCA 2014)	South African Slug-eater
Homoroselaps lacteus	Lamprophiidae	Least Concern (SARCA 2014)	Spotted Harlequin Snake
Lamprophis guttatus	Lamprophiidae	Least Concern (SARCA 2014)	Spotted House Snake
Lycodonomorphus inornatus	Lamprophiidae	Least Concern (SARCA 2014)	Olive House Snake
Lycodonomorphus rufulus	Lamprophiidae	Least Concern (SARCA 2014)	Brown Water Snake
Psammophis crucifer	Lamprophiidae	Least Concern (SARCA 2014)	Cross-marked Grass Snake
Psammophylax rhombeatus	Lamprophiidae	Least Concern (SARCA 2014)	Spotted Grass Snake
Acontias meleagris	Scincidae	Least Concern (SARCA 2014)	Cape Legless Skink
Trachylepis capensis	Scincidae	Least Concern (SARCA 2014)	Cape Skink
Trachylepis homalocephala	Scincidae	Least Concern (SARCA 2014)	Red-sided Skink
Trachylepis variegata	Scincidae	Least Concern (SARCA 2014)	Variegated Skink
Homopus areolatus	Testudinidae	Least Concern (SARCA 2014)	Parrot-beaked Tortoise
Stigmochelys pardalis	Testudinidae	Least Concern (SARCA 2014)	Leopard Tortoise
Rhinotyphlops lalandei	Typhlopidae	Least Concern (SARCA 2014)	Delalande's Beaked Blind Snake
Bitis arietans arietans	Viperidae	Least Concern (SARCA 2014)	Puff Adder
Causus rhombeatus	Viperidae	Least Concern (SARCA 2014)	Rhombic Night Adder
Amphibians			
Breviceps fuscus	Brevicepitidae	Least Concern	Plain Rain Frog

Scientific Name	Family	Status	Common Name
Breviceps montanus	Brevicepitidae	Least Concern	Cape Mountain Rain Frog
Capensibufo tradouwi	Bufonidae	Least Concern	Tradouw Toadlet
Sclerophrys capensis	Bufonidae	Least Concern	Raucous Toad
Sclerophrys pardalis	Bufonidae	Least Concern	Eastern Leopard Toad
Vandijkophrynus gariepensis gariepensis	Bufonidae		Karoo Toad (subsp. gariepensis)
Heleophryne regis	Heleophrynidae	Least Concern	Southern Ghost Frog
Afrixalus knysnae	Hyperoliidae	Endangered	Knysna Leaf-folding Frog
Hyperolius horstockii	Hyperoliidae	Least Concern	Arum Lily Frog
Hyperolius marmoratus	Hyperoliidae	Least Concern (IUCN ver 3.1, 2013)	Painted Reed Frog
Hyperolius marmoratus verrucosus	Hyperoliidae	Least Concern (IUCN ver 3.1, 2013)	Painted Reed Frog (subsp. verrucosus)
Semnodactylus wealii	Hyperoliidae	Least Concern	Rattling Frog
Xenopus laevis	Pipidae	Least Concern	Common Platanna
Amietia delalandii	Pyxicephalidae	Least Concern	Delalande's River Frog
Amietia fuscigula	Pyxicephalidae	Least Concern	Cape River Frog
Amietia vandijki	Pyxicephalidae	Data Deficient	Van Dijk's River Frog
Cacosternum boettgeri	Pyxicephalidae	Least Concern	Common Caco
Cacosternum nanum	Pyxicephalidae	Least Concern	Bronze Caco
Strongylopus bonaespei	Pyxicephalidae	Least Concern	Banded Stream Frog
Strongylopus fasciatus	Pyxicephalidae	Least Concern	Striped Stream Frog
Strongylopus grayii	Pyxicephalidae	Least Concern	Clicking Stream Frog
Tomopterna delalandii	Pyxicephalidae	Least Concern	Cape Sand Frog
Invertebrates			
Scorpions (all)		**T.o.P.S**	
Baboon Spiders		**T.o.P.S**	
Butterflies			
Aloeides thyra orientis	LYCAENIDAE	**Endangered (SABCA 2013)**	Red copper
Orachrysops niobe	LYCAENIDAE	**Critically Endangered (SABCA 2013)**	Brenton blue
Thestor brachycerus brachycerus	LYCAENIDAE	**Critically Endangered (SABCA 2013)**	Seaside skolly

10 Appendix E: Legislation

10.1 General Authorizations in Terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998)

4.12.(1) A person who disposes of wastewater in terms of this authorisation must submit a registration form obtained from the Department, for registration of the water use before the commencement of the disposal if more than 50 cubic metres of domestic wastewater or biodegradable industrial wastewater is disposed of on any given day.

4.13. Wastewater storage dams and wastewater disposal sites must be located-

(a) outside of a watercourse;

(b) above the 100 year flood line, or alternatively, more than 100 metres from the edge of a water resource or a borehole which is utilised for drinking water or stock watering; and

(c) on land that is not, or does not overlie, a Major Aquifer (identification of a Major Aquifer will be provided by the Department upon written request).

4.14.(1) The registered user, with the exception of a local authority, must ensure the establishment of monitoring programmes to monitor the quantity and quality of the wastewater prior to storage or disposal, as follows-

10.2 Environment Conservation Act and Regulations GN154

Development must be environmentally, socially and economically sustainable. Sustainable development requires the consideration of inter alia the following factors:

j) that pollution and degradation of the environment is avoided, or, where they cannot be altogether avoided, are minimised and remedied;

k) that waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;

l) that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;

m) that the development, use and exploitation of renewable resources and the eco-systems of which they are part do not exceed the level beyond which their integrity is jeopardised; and

n) that negative impacts on the environment and on peoples' environmental rights be anticipated and prevented, and where they cannot be altogether prevented are minimised and remedied.

o) Environmental management must place people and their needs at the forefront of its concern, therefore any environmental impacts resulting from the development activities are not distributed in such a manner as to unfairly discriminate against any persons, particularly vulnerable and disadvantaged persons.

p) In terms of section 20, the developer is required to obtain a permit from DWAF in order to establish, provide or operate any waste disposal site within the boundaries of the property.

q) Where medical, hazardous or domestic wastes are to be removed from the site by contractors, the developer needs to place a contractual obligation on the contractor to dispose of the waste at a licensed site and to ensure that this is properly done.

r) The developer is required to undertake Environmental Impact Assessments (EIA) for all projects listed as a Schedule 1 activity in the EIA regulations in order to control activities which might have a detrimental effect on the environment. Such activities will only be permitted with written authorisation from a competent authority.

10.3 Conservation of Agricultural Resources Act 43 of 1983 and Conservation of Agricultural Resources Regulations.

In terms of section 6 of the Act, the Minister may prescribe control measures with which all land users have to comply. The control measure may relate to the following:

d) the regulating of the flow pattern of run-off water;

e) the control of weeds and invader plants;

f) the restoration or reclamation of eroded land or land which is otherwise disturbed or denuded;

10.4 Forest Act 122 of 1984

Protected trees

The Forest Act provided for the protection of trees on private land by providing that 'no person may cut, damage, destroy, disturb or remove any *protected tree* from the land in question, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any part or produce thereof'. The Minister was authorised, in respect of any land not forming part of a State forest, to declare a particular tree, a particular group of trees, or trees belonging to a particular species occurring on that land, to be a protected tree or trees (Appendix 6) Regulations published under the Act list 58 species of protected trees to which these prohibitions apply. Although the NFA has repealed the old Forest Act, the majority or regulations promulgated under the Act still remain in force until such time they are replaced by new regulations under the NFA.

10.5 National Forests Act 84 of 1998

Protected trees

The Minister may declare a tree, group of trees, woodland or a species of trees as protected. The Minister is required to publish a list of all species protected under this Act, an appropriate warning of the prohibitions set out and the consequences of its infringements, annually in the Government Gazette. The prohibitions provide that ' no person may cut, damage, disturb, destroy or remove any *protected tree*, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister'.

10.6 Western Cape Nature Conservation Laws Amendment Act (3 Of 2000)

Provide for the amendment of various laws on nature conservation in order to transfer the administration of the provisions of those laws to the Western Cape Nature Conservation Board; to amend the Western Cape Nature Conservation Board Act, 1998 to provide for a new definition of Department and the deletion of a definition; to provide for an increase in the number of members of the Board; to provide for additional powers of the Board; to amend the provisions regarding the appointment and secondment of persons to the Board; and to provide for matters incidental thereto.

Section 63 relates to the picking of protected flora:

Prohibition on picking of certain flora

63. (1) No person shall—

(a) uproot the plant in the process of picking the flower of any flora;

(b) without a permit—

(i) pick any endangered or protected flora, or

(ii) pick any flora on a public road or on the land on either side of such road

within a distance of ninety metres from the centre of such road, or

(c) pick any protected or indigenous unprotected flora on land of which he or she is not the owner, without the permission of the owner of such land or of any person authorised by such owner to grant such permission.

(2) No permission granted in terms of subsection (1)(c) shall be valid unless it is reduced to writing and reflects—

(a) the full names and address of the owner of the land concerned or of the person authorised to grant such permission;

(b) the full names and address of the person to whom permission is granted, and

(c) the number and species of flora, the date or dates on which such flora may be picked and the land in respect of which permission is granted, and is signed and dated by such owner or the person authorised by him or her.

(3) The provisions of subsection (1)(b) shall not apply to the owner of any land, any relative of such owner and any full-time employee of such owner acting on the instructions or with the consent of such owner, in respect of any protected or indigenous unprotected flora on such land.

(4) The provisions of subsection (1)(b)(i) shall not apply to any person authorized in writing by the owner of any land to pick any protected flora on such land for the purpose of gathering and propagating the seed of such flora.

10.7 Provincial Nature Conservation Ordinance (PNCO) of 1974

Protected indigenous plants in general are controlled under the relevant provincial Ordinances or Acts dealing with nature conservation. In the Eastern Cape the relevant statute is the 1974 Provincial Nature Conservation Ordinance. In terms of this Ordinance, a permit must be obtained from Department of Economic Affairs Environment and Tourism (DEAET) to remove or destroy any plants listed in the Ordinance.

11 Appendix F: Specialist CV, SACNASP Registration and Declaration

Name of firm	Engineering Advice & Services (Pty) Ltd
Name of staff	JAMIE ROBERT CLAUDE POTE
ID Number	740515 5152 089
Profession	Registered Ecological Scientist and Environmental Scientist
Years with firm	3 Years
Nationality	South African
Membership to Professional Societies	The South African Council for Natural Scientific Professions (SACNASP): Pr. Sci. Nat.: 115233 International Association for Impact Assessment South Africa (IAIAsa) Member Number 5045

KEY QUALIFICATIONS

Mr Jamie Pote has 15 years extensive professional experience in a wide range of Ecological Specialist Assessments in South Africa (Eastern, Western & Northern Cape, Gauteng and Limpopo), Namibia, Mozambique, Democratic Republic of Congo, Republic of Congo and Ghana in the Infrastructure, Mining and Development Sectors. He also has experience in conducting Basic Assessments, EIA's, Section 24 G applications and Mining Permit EMP's as well as developing GIS and other tools for Environmental related work.

He has broad ecological experience in a wide range of habitats and ecosystems in Southern, West and Central Africa and has been involved in all stages of project development from inception, through planning and environmental application and authorization (BAR and EMP) to implementation (Flora relocation) and compliance monitoring (ECO auditing). Jamie has a well-deserved reputation for providing quality professional services. His strategy incorporates using proven methodologies with a highly responsive approach to sound environmental management, including developing adaptive methodologies and approaches with available technologies. He is highly capable of working within a team of qualified professionals or in an individual capacity.

EDUCATION

•BSc	Rhodes University (Botany and Environmental Science)	2001
•BSc (Hons)	Rhodes University (Botany)	2002

EMPLOYMENT RECORD

2003 – 2014	Self Employed Consultant	Specialist Environmental Consultant (Ecology)
2014 (Aug) – present	Engineering Advice & Services	Environmental Unit Manager, EAP and Ecologist

LANGUAGES

	Speak	**Read**	**Write**
English	Excellent	Excellent	Excellent
Afrikaans	Good	Excellent	Excellent

PROJECT EXPERIENCE

SPECIALISED ECOLOGICAL REPORTS

- Botanical & Riparian Assessment for Orange River Weirs-Boegoeberg, Douglas Dam and Sendelingsdrif in Northern Cape 2006
- Botanical Assessment for State of the Environment Report for Chris Hani District Municipality SoER in Eastern Cape 2003
- Forestry Rehabilitation Assessment Report for Amahlathi Forest Rehabilitation in Eastern Cape 2007
- Botanical Sensitivity Analysis for LSDP, Greenbushes-Hunters Retreat in NMB 2008
- Representative for landowner group for Seaview burial Park in NMB 2010
- Mapping of bridge for Kenton Water Board in Eastern Cape 2010

- Rehabilitation Plan for N2 Upgrade - Coega to Colchester in NMB 2010
- Rehabilitation Plan for Nieu Bethesda in Eastern Cape 2011
- Mapping and Ecological services for Congo Agriculture in Republic of Congo 2013
- Section 24G Assessment and Rehabilitation Plan for Bingo Farm in Eastern Cape 2014
- Green Star Rating Ecological Assessment for SANRAL office, Bay West City, NMBM 2015
- Rehabilitation Plan for Hitgeheim Farm (Farm 960), Sunland, Eastern Cape 2017

FLORA AND FAUNA RELOCATION PLANS, PERMITS AND IMPLEMENTATION

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

INFRASTRUCTURE DEVELOPMENT PROJECTS

- Botanical Assessment for PE Airport Extention in NMB 2006
- Botanical Assessment and GIS mapping for golf course realignment for East London Golf Course in BCM, Eastern Cape 2007
- Botanical Assessment for Radar Mast construction for South African Weather Service - BCM and NMB 2008
- Ecological Assessment for Jansenville Cemetery in Eastern Cape 2009
- Ecological Assessment for Kouga Dam wall upgrade in Eastern Cape 2012
- Botanical Assessment for Kidd's Beach Desalination Plant in BCM, Eastern Cape 2006

POWERLINE INFRASTRUCTURE PROJECTS

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

BRIDGE INFRASTRUCTURE PROJECTS

- Detailed Botanical Assessment for Port Alfred water bridge in Eastern Cape 2004
- Botanical & Floristic Report for Hankey bridge in Eastern Cape 2006
- Environmental Risk Assessment for Elands River bridge in Eastern Cape 2007
- Detailed Botanical Assessment for Motherwell Bridge in NMB 2007
- Detailed Botanical Assessment, GIS maps for Erasmuskloof Bridge in Eastern Cape 2007
- Map Production for Russell Rd Stormwater in NMB 2008
- Basic Botanical Assessment for Albany Bridge in Eastern Cape 2008
- Species of Special Concern Mapping for Seaview Bridge in NMB 2009
- Species of Special Concern Mapping for Chelsea Bulk Water Bridge in NMB 2009
- Basic Botanical Assessment for Wanhoop farm bridge in Eastern Cape 2010
- Basic Botanical Assessment for Chatty Sewer in NMB 2010
- Detailed Ecological Assessment for Suikerbos Bridge in Gauteng 2012

- Ecological Assessment for Steytlerville Bulk Water Supply in Eastern Cape (Phase 4) 2013
- Ecological Assessment for Steytlerville Bulk Water Supply in Eastern Cape (Phase 5) 2013
- Vegetation Assessment for Wanhoop-Willowmore Bulk Water Supply in Eastern Cape 2016
- Vegetation Assessment for Butterworth Emergency Water Supply Scheme 2017

ROAD AND RAILWAY INFRASTRUCTURE PROJECTS

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

MINING PROJECTS

- Biophysical Assessment for Humansdorp Quarry in Eastern Cape 2006
- Botanical Assessment, Rehab Plan & Maps for Quarry-Cathcart & Somerset East in Eastern Cape 2006
- Botanical Assessment, Rehab Plan & Maps for Quarry - Despatch Quarry in NMB 2006
- GIS Mapping & Botanical Assessment and Rehab Plan for Quarry - JBay Crushers in Eastern Cape 2006
- Botanical Assessment, EMP and Rehabilitation Plan for Polokwane Silicon Smelter in Limpopo 2006
- Application for Mining Permit for Bruce Howarth Quarry in Eastern Cape 2006
- Botanical Assessment for Scoping Report and Detailed Botanical Assessment and Rehab Plan for Elitheni Coal Mine in Eastern Cape 2007
- Botanical Assessment, Rehab Plan & Maps for Borrow Pit - Oyster Bay in Eastern Cape 2007
- Botanical Assessment, Rehab Plan & Maps for Borrow Pit - Bathurst/GHT in Eastern Cape 2007
- Botanical Assessment, Rehab Plan & Maps for Borrow Pit – Jeffreys Bay in Eastern Cape 2007
- Botanical Assessment, Rehab Plan & Maps for Borrow Pit - Storms river/Kareedouw in Eastern Cape 2007
- Botanical Assessment for Zwartenbosch Quarry in Eastern Cape 2008
- Botanical description & map production for Quarry - Rudman Quarry in Eastern Cape 2008
- Botanical Basic Assessment, Rehab Plan & Maps for Borrow Pit - Rocklands/Patensie in Eastern Cape 2008
- Botanical Assessment & Maps for Sandman Sand Gravel Mine in Eastern Cape 2008
- Botanical Assessment & GIS maps for Shamwari Borrow Pit in Eastern Cape 2008
- Detailed Botanical Assessment, EMP and Rehab Plan for Kalakundi Copper/Cobalt Mine in Democratic Republic of Congo 2008
- Botanical Assessment, Rehab Plan & Maps for Borrow Pit Humansdorp/Oyster Bay in Eastern Cape 2008
- Botanical Assessment, Rehab Plan & Maps for AWRM - Cala in Eastern Cape 2008
- Botanical Assessment, Rehab Plan & Maps for AWRM - Camdeboo in Eastern Cape 2008
- Botanical Assessment, Rehab Plan & Maps for AWRM - Somerset East in Eastern Cape 2008
- Botanical Assessment, Rehab Plan & Maps for AWRM - Nkonkobe in Eastern Cape 2008
- Botanical Assessment, Rehab Plan & Maps for AWRM - Ndlambe in Eastern Cape 2008
- Botanical Assessment, Rehab Plan & Maps for AWRM - Blue Crane Route in Eastern Cape 2008
- Botanical Assessment, EMP and Rehabilitation Plan for AWRM - Cathcart in Eastern Cape 2008
- Botanical Assessment, GIS maps and Rehab Plan for Mthatha Prospecting in Eastern Cape 2008
- Regional Botanical Map for mining prospecting permit for Welkom Regional mapping in 2008
- Ecological Assessment and Mining and Rehabilitation Plan for Baghana Mining in Ghana 2010
- Ecological Assessment for Bochum Borrow Pits in Limpopo 2013
- Ecological Assessment and Mining and Rehabilitation Plan for Greater Soutpansberg Mining Project in Limpopo (3 proposed Mines) 2013
- Ecological Assessment for Thulwe Road Borrow Pits in Limpopo 2013

WIND FARM AND PHOTOVOLTAIC INFRASTRUCTURE PROJECTS

- Botanical Assessment for Electrawinds Windfarm Coega in NMB 2010
- Botanical Assessment and Open Space Management Plan for Mainstream Windfarm Phase 2 in Eastern Cape 2010
- Ecological Assessment for Inca Energy Windfarm in Northern Cape 2011
- Ecological Assessment for Universal Windfarm in NMB 2011
- Ecological Assessment for Broadlands Photovoltaic Farm in the Eastern Cape 2011

- Ecological Assessment for Windcurrent Wind Farm in Eastern Cape 2012

BUSINESS AND INDUSTRIAL DEVELOPMENT PROJECTS

- Botanical Assessment for Kenton Petrol Station in Eastern Cape 2005
- Botanical Assessment and RoD amendments for Colchester - Petrol Station in NMB 2005
- Botanical Assessment for Bluewater Bay Erf 805 in NMB 2009
- Botanical Assessment and Open Space Management Plan for Petro SA Refinery, Coega IDZ in NMB 2010
- Ecological Assessment for OTGC Tank Farm in NMB 2012
- Ecological Assessment for Green Star grading for SANRAL in NMB 2014
- Ecological Assessment for Bay West City ENGEN Service Station 2015

HOUSING DEVELOPMENT PROJECTS

- Botanical Assessment for Bridgemead – Malabar PE in NMB 2004
- Botanical Basic Assessment for Trailees Wetland Assessment in Eastern Cape 2005
- Botanical Assessment and Rehab Plan for Arlington Racecourse - PE in NMB 2005
- Botanical Assessment for Smart Stone in NMB 2005
- Botanical Assessment for Peninsular Farm (Port Alfred) in Eastern Cape 2005
- Botanical Assessment for Mount Pleasant - Bathurst in Eastern Cape 2005
- Botanical Assessment and RoD amendments for Colchester Erven 1617 & 1618 (Riverside) in NMB 2005
- Basic Botanical Assessment for Parsonsvlei 3/4 in Eastern Cape 2005
- Botanical Assessment for Gonubie Portion 809/9 in BCM, Eastern Cape 2006
- Botanical Assessment for Glengariff Farm 723 in BCM, Eastern Cape 2006
- Botanical Assessment for Gonubie Portion 809/10 in BCM, Eastern Cape 2006
- Botanical Assessment for Gonubie Portion 809/4 & 5 in BCM, Eastern Cape 2006
- Botanical Assessment for Plettenberg bay - Ladywood 438/1&3 in Western Cape 2006
- Botanical Assessment and Rehab Plan for Winterstrand Desalination Plant in BCM 2006
- Botanical Assessment for Bosch Hoogte in NMB 2006
- Botanical Assessment for Plettenberg bay Farm 444/38 in Western Cape 2006
- Botanical Assessment for Plettenberg Bay - 444/27 in Western Cape 2006
- Botanical Assessment for Leisure Homes in BCM, Eastern Cape 2006
- Botanical Assessment for Plettenberg Bay - 438/24 in Western Cape 2007
- Botanical Assessment for Plettenberg Bay - Olive Hills 438/7 in Western Cape 2007
- Vegetation Assessment for Kwanokuthula RDP housing project in Western Cape 2008
- Site screening assessment for Greenbushes Site screening in NMB 2008
- Botanical Assessment for Fairfax development in Eastern Cape 2008
- Botanical Assessment for Plettenberg Bay Brakkloof 50&51 in Western Cape 2008
- Botanical Assessment, GIS mapping for Theescombe Erf 325 in NMB 2008
- Site Screening for Mount Road in NMB 2008
- Botanical Assessment for Greenbushes Farm 40 Swinburne 404 in NMB 2008
- Botanical Assessment for Greenbushes 130 in NMB 2008
- Botanical Assessment for Greenbushes Kuyga no. 10 in NMB 2008
- Botanical Assessment for Kouga RDP Housing in Eastern Cape 2009
- Botanical Assessment for Fairview Erf 1226 (Wonderwonings) in NMB 2009
- Species List Compilation for Zeeloeirivier Humansdorp in Eastern Cape 2009
- Botanical Assessment for Woodlands Golf Estate (Farm 858) in BCM, Eastern Cape 2009
- Botanical Assessment for Plettenberg Bay - 438/4 in Western Cape 2009
- Botanical Assessment for The Crags 288/03 in Western Cape 2010
- Revision of Ecological Assessment for Fairview Housing – NMB (EC) 2010
- Botanical Assessment, EMP and Open Space Management Plan for Hornlee Housing Development in WC 2010
- Botanical Assessment for Little Ladywood in Western Cape 2010
- Botanical Assessment and Open Space Management Plan for Motherwell NU31 in NMB 2010
- Botanical Assessment and Open Space Management Plan for Plett 443/07 in Western Cape 2010
- Botanical Assessment for Willow Tree Farm in NMB 2010
- Flora Search and Rescue Plan for Kwanobuhle Housing in Western Cape 2011
- Ecological Assessment for Ethembeni Housing in NMB 2012
- Ecological Assessment for Pelana Housing in Limpopo 2012
- Ecological Assessment for Lebowakgoma Housing in Limpopo 2013
- Ecological Assessment for Giyani Development in Limpopo 2013
- Ecological Assessment for Palmietfontein Development in Limpopo 2013
- Ecological Assessment for Seshego Development in Limpopo 2013

- Botanical Assessment for Sheerness Road in BCM, Eastern Cape 2013
- Ecological Assessment for Hankey Housing, Kouga District Municipality 2015
- Ecological Assessment for erf 15, Kabega, Port Elizabeth 2017

GOLF ESTATE AND RESORT DEVELOPMENT PROJECTS

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

MIXED USE DEVELOPMENT PROJECTS

- Botanical Assessment and GIS mapping for Madiba Bay Leisure Park in NMB 2007
- Botanical Assessment and GIS mapping for Madiba Bay Leisure Park in NMB 2007
- Botanical Basic Assessment for Cuyler Manor (Farm 320), Uitenhage in NMB 2007
- Botanical Assessment and GIS maps for Utopia Estate PE in NMB 2008
- Botanical Assessment, GIS maps, Open Space and Rehab Plans for Fairview Erf 1082 in NMB 2009
- Botanical Assessment, EMP and Open Space Management Plan for Bay West City in NMB 2010

ECO-ESTATE DEVELOPMENT PROJECTS

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

AGRICULTURAL PROJECTS

- Botanical Assessment and Flora Relocation Plan for Wildemans Plaas, in NMB 2006
- Botanical Assessment and Open Space Management Plan for Kudukloof in NMB 2010
- Botanical Assessment and Open Space Management Plan for Landros Veeplaats in NMB 2010
- Ecological Assessment for Tzaneen Chicken Farm in Limpopo 2013
- Ecological Assessment for Doornkraal Pivot (Hankey) in Eastern Cape 2014
- Ecological Assessment for Citrus expansion on farm 960, Patensie 2014
- Ecological Assessment for Citrus expansion on Hitgeheim Farm, Sunland, Eastern Cape 2015

ENVIRONMENTAL MANAGEMENT PLANS

- Floral Survey for Mbotyi Conservation Assessment in Eastern Cape 2005
- Identifying and Assessment on Aquatic Weeds for Pumba Private Game Reserve in Eastern Cape 2005
- Biodiversity & Ecological Processes for Bathurst-Commonage in Eastern Cape 2006
- EMP for Kromensee EMP (Jeffries Bay) in Eastern Cape 2006
- Baseline Botanical Study, Vegetation mapping and EMP for Local Nature Reserve for Plettenberg Bay Lookout LNA in Western Cape 2009
- Basic Botanical Assessment for Kromensee EMP (Jeffries Bay) in Eastern Cape 2010
- Wetland Management Plan for NMB Portnet in NMB 2010

ENVIRONMENTAL MANAGEMENT, ENVIRONMENTAL CONTROL OFFICER, AUDITING AND MONITORING PROJECTS

- Flora Relocation Plan and Permit application for Wildemans Plaas, in NMB 2006
- EMP submission and ECO for Seaview Garden Estate in NMB 2010
- EMP and ECO for Sinati Golf Estate EMP in BCM, Eastern Cape 2009
- ECO audits for NMB Road surfacing in NMB (multiple contacts) 2011
- ECO for Mainstream Windfarm wind monitoring mast installation in Eastern Cape 2010
- Final EMP submission for Seaview Garden Estate in NMB 2012
- EMP and ECO for Utopia Estate in NMB 2013
- ECO for Riversbend Citrus Farm in NMB 2014
- ECO for Alfred Nzo DM Road resurfacing - DR08071, DR08649, DR08092, DR08418, DR08452, DR08015, DR08085, DR08639 & DR08073 in Eastern Cape - MSBA 2014
- ECO Audits for Koukamma Flood Damage Road Repairs – Hatch Goba 2014
- ECO for DRPW IRM Road Maintenance projects in Amahlathi Municipality 2015
- ECO for DRPW IRM Road Maintenance projects in Makana/Ndlambe Municipality 2015
- ECO for DRPW IRM Road Maintenance projects in Mbashe/Mqume Municipality 2015
- ECO for DRPW IRM Road Maintenance projects in Port St Johns, Mbizana, Ingquza Hill Municipalities 2015
- ECO and Botanical Specialist for the special maintenance of national route R61 Section 2 from Elinus Farm (km 42.2) to N10 (km 85.0) (SANRAL) 2016
- Environmental Control Officer (ECO): Construction of NSRI Slipway - Port Elizabeth Harbour 2016
- ECO for SANRAL RRP Road Maintenance projects in Mbashe LM 2016
- ECO for SANRAL RRP Road Maintenance projects in Nkonkobe LM 2016
- ECO for SANRAL RRP Road Maintenance projects in Mbizana LM 2016
- ECO for SANRAL RRP Road Maintenance projects in Senqu LM 2016
- ECO for SANRAL RRP Road Maintenance projects in Elundini LM 2016
- ECO and Environmental Management for closure of Bushmans River Landfill site 2016
- ECO for Citrus expansion on Farm 960, Patensie (AIN du Preez Boerdery) 2017
- ECO for Citrus expansion on Hitgeheim Farm (Farm 960), Sunland, Eastern Cape 2017
- DEO for improvement of national route R67 section 5 from Whittlesea (km 0.00) to Swart Kei river (km 15.40) – Murray & Roberts 2017

BASIC ASSESSMENT REPORT PROJECTS (DEDEAT)

- Basic Assessment Application for Citrus expansion on farm 960, Patensie (AIN du Preez Boerdery) 2014
- Basic Assessment Application for Citrus expansion on Hitgeheim Farm, Sunland, Eastern Cape 2015
- Basic Assessment Application for Hankey Housing, Kouga District Municipality 2015

MINING PERMIT/ENVIRONMENTAL MANAGEMENT PROGRAMME APPLICATIONS (DMR)

- Mining BAR/EMP's for Chris Hani DM Borrow Pits - MR00716 (DRPW) 2014
- Mining BAR/EMP's for Chris Hani DM Borrow Pits - DR02581 (DRPW) 2014
- Mining BAR/EMP's for Chris Hani DM Borrow Pits - DR08041, DR08247, DR08248 & DR08504 (DRPW) 2014
- Mining BAR/EMP's for Chris Hani DM Borrow Pits - DR08599, DR08601 & DR08570 (DRPW) 2014
- Mining BAR/EMP's for Chris Hani DM Borrow Pits - DR08235, DR08551 & DR08038 (DRPW) 2014
- Mining BAR/EMP's for Alfred Nzo DM Borrow Pits - DR08092, DR08093 & DR08649 (DRPW) 2014
- Mining BAR/EMP's for Alfred Nzo DM Borrow Pits - DR08090, DR08412, DR08425, DR08129, DR08109, DR08106, DR08104 & DR08099 – Matatiele (DRPW)
- Mining BAR/EMP's for Chris Hani DM Borrow Pits - MR00716 (Tarkastad) (DRPW) 2015
- Mining BAR/EMP's for Chris Hani DM Borrow Pits – Intsika Yethu and Emalahleni (DRPW) 2015
- Mining BAR/EMP's for Joe Gqabi DM Borrow Pits – Senqu (DRPW) 2015
- Mining BAR/EMP's for Makana/Ndlambe LM Borrow Pits – Sarah Baartman (DRPW) 2015
- Mining BAR/EMP's for Amahlathi LM Borrow Pits – Amatole (DRPW) 2015
- Mining BAR/EMP's for Mbashe/Mqume LM Borrow Pits – Amatole (DRPW) 2015
- Mining BAR/EMP's for Sundays River Valley LM Borrow Pits – Sarah Baartman (DRPW) 2015
- Mining BAR/EMP's for Kouga LM Borrow Pits – Sarah Baartman (DRPW) 2015
- Mining BAR/EMP's for Nkonkobe LM Borrow Pits – (SANRAL) 2016
- Mining BAR/EMP's for Mbhashe LM Borrow Pits – (SANRAL) 2016
- Mining BAR/EMP's for Mbizana LM Borrow Pits – (SANRAL) 2016
- Mining BAR/EMP's for Senqu LM Borrow Pits – (SANRAL) 2016
- Mining BAR/EMP's for Elundini LM Borrow Pits – (SANRAL) 2016
- Mining BAR/EMP's for Emalahleni LM Borrow Pits – (SANRAL) 2016

- Mining BAR/EMP's for Emalahleni LM Borrow Pits – (DRPW) 2016
- Mining BAR/EMP's for Ikwezi/Baviaans LM Borrow Pits – (DRPW) 2016
- Mining BAR/EMP's for Ingquza Hill LM Borrow Pits – (SANRAL) 2017

SECTION 24G APPLICATIONS

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

ENVIRONMENTAL SCREENING PROJECTS

- Terrestrial Vegetation Risk Assessment for proposed Skietnek Citrus Farm development (Kirkwood) 2015
- Preliminary Environmental Risk Assessment: NSRI Slipway, NMB 2015
- Environmental Screening Report for Proposed Development of a Dwelling on Erf 899, Theescombe, NMB 2015
- Environmental Screening Report for Proposed Development on Erf 559, Walmer, NMB 2015
- Environmental Screening Report for Proposed Housing Scheme Development of Erf 8709, Wells Estate, NMB 2015

GIS AND IT DEVELOPMENT

- Development of GIS databases and mapping tools for Manifold GIS software 2008
- Landsat Image classification and analysis (Congo Agriculture) 2010
- Development of *iAuditor* Environmental Audit templates (DRPW audits) 2014
- Environmental Risk model for Borrow Pit screening in Eastern Cape 2016
- Development of audit templates for DRPW and SANRAL projects 2017

CONFERENCES AND PUBLICATIONS

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

RESEARCH EXPERIENCE

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

SACNASP
South African Council for Natural Scientific Professions

herewith certifies that

Jamie Robert Claude Pote
Registration number: 115233

is registered as a

Professional Natural Scientist

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

Ecological Science

Effective **20 July 2016** Expires **31 March 2019**

President

Executive Director

Engineering Advice and Services (Pty) Ltd

Associated with ULWAZI

www.easpe.co.za

Port Elizabeth Office:
Tel: (041) 581 2421
Fax: (086) 683 9899
E-mail: easpe@easpe.co.za
73 Heugh Rd, Walmer
PO Box 13867, Humewood
PORT ELIZABETH, 6013

VAT No : 4110162205

Our Ref: F:\1600-1699\1626\Environmental\Reports\Biophysical Reports\1626 - Kranshoek Ecological Assessment - Addendum - Revised layout 20190715.doc

15 July 2019

Attention: Betsy Ditcham
Sharples Environmental Services cc
102 Merriman St
George, 6530

KRANSHOEK PROPOSED HOUSING DEVELOPMENT - ECOLOGICAL ASSESSMENT REPORT: ADDENDUM 1 – ASSESSMENT OF REVISED LAYOUT TO ACCOMMODATE WETLAND BUFFER

Subsequent to the layout assessed (Annexure A) assessed in the original ecological assessment report (dated 08 February 2019), a revised layout (Annexure B) has been developed to accommodate reports by Specialists and comments raised by CapeNature (refer to letter dated 12 June 2019) as depicted in Annexure B.

A revised and consolidated map (Annexure C) indicates the buffers from the ecological and wetland assessments as well as the revised proposed Open Space. The proposed open space along the east-west drainage line as indicated in green is acceptable w.r.t ecological requirements.

In addition to this, it is recommended that the Ecological Support Area (as depicted on all maps), or at least a portion thereof must also be included as P.O.S. on the layout plan in order to retain connectivity and a buffer across the north-eastern corner surrounding the drainage line, which is significantly degraded. Alien vegetation should be removed from this area.

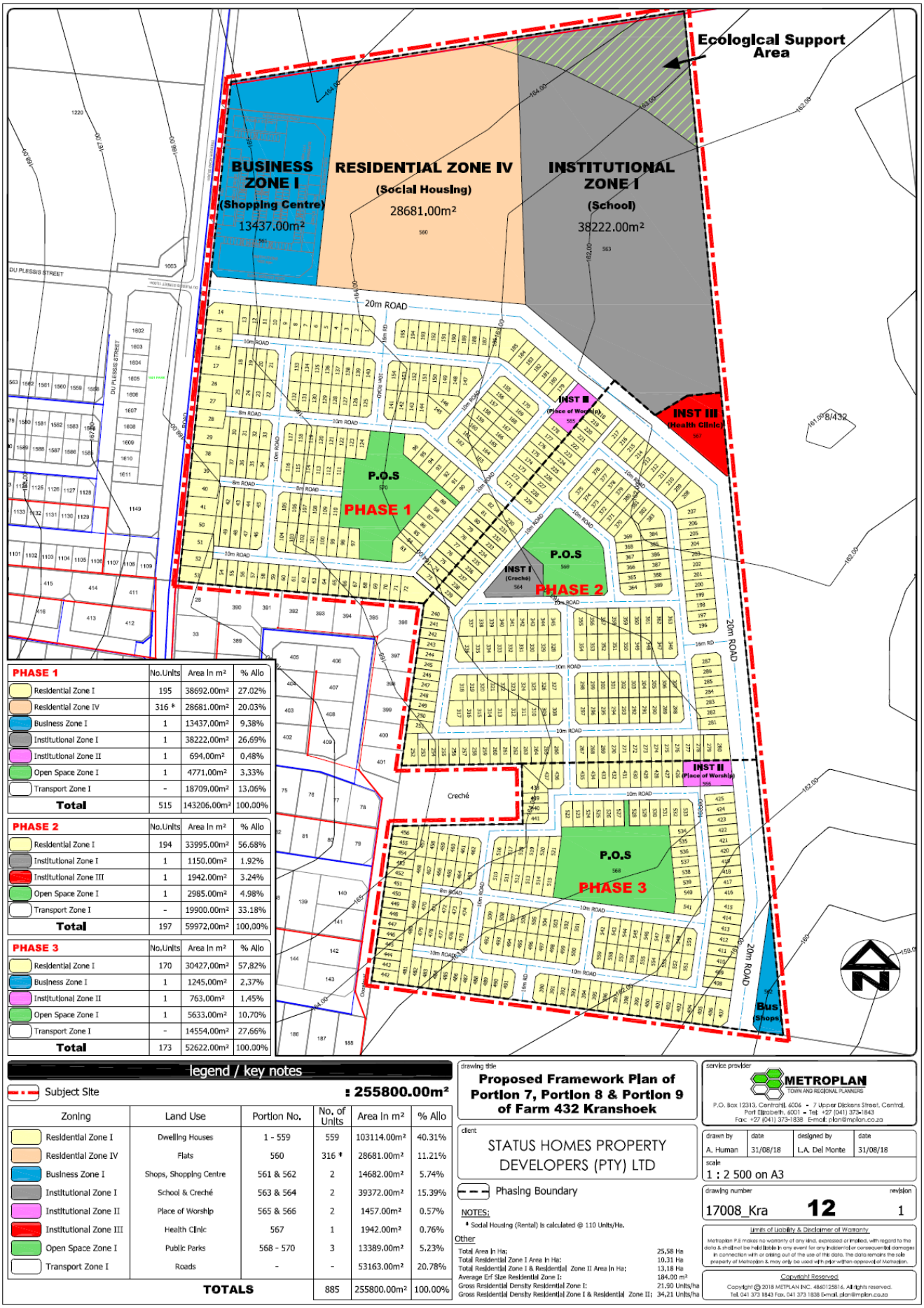
As per recommendation in the Ecological Assessment Report dated 08 February '*Retention of a buffer around the (*central east-west*) drainage lines as well as the north-eastern portion (Ecological Support Area) as Open Space as well as the overall development of a 'compact urban settlements, whilst maintaining an open space system' thus means that the proposed development is possible whilst meeting the guideline recommendations.'*

The recommendation for Other Natural Areas, as per the Western Cape Biodiversity Spatial Plan (Annexure D), is '*authorisation may still be required for high-impact land uses.'* These areas will be included in the application for which authorisation is being applied. The ecological assessment report concluded that although these areas have some indigenous vegetation, the negative *species loss and ecosystem functionality* loss will not be sufficiently significant to prevent the development from being viable.

Kind Regards

……
Mr Jamie Pote BSc (Hons) Pr. Sci. Nat.
For: Engineering Advice and Services

ANNEXURE A: ORIGINAL SITE DEVELOPMENT PLAN (OPTION 01)



PHASE 1	No.Units	Area in m²	% Allo
Residential Zone I	195	38692.00m²	27.02%
Residential Zone IV	316 *	28681.00m²	20.03%
Business Zone I	1	13437,00m²	9,38%
Institutional Zone I	1	38222,00m²	26,69%
Institutional Zone II	1	694,00m²	0,48%
Open Space Zone I	1	4771,00m²	3,33%
Transport Zone I	-	18709,00m²	13,06%
Total	515	143206.00m²	100.00%

PHASE 2	No.Units	Area in m²	% Allo
Residential Zone I	194	33995.00m²	56.68%
Institutional Zone I	1	1150.00m²	1.92%
Institutional Zone III	1	1942.00m²	3.24%
Open Space Zone I	1	2985.00m²	4.98%
Transport Zone I	-	19900.00m²	33.18%
Total	197	59972,00m²	100,00%

PHASE 3	No.Units	Area in m²	% Allo
Residential Zone I	170	30427,00m²	57,82%
Business Zone I	1	1245,00m²	2,37%
Institutional Zone II	1	763,00m²	1,45%
Open Space Zone I	1	5633,00m²	10,70%
Transport Zone I	-	14554,00m²	27,66%
Total	173	52622.00m²	100.00%

legend / key notes

Subject Site : 255800.00m²

Zoning	Land Use	Portion No.	No. of Units	Area in m²	% Allo
Residential Zone I	Dwelling Houses	1 - 559	559	103114.00m²	40.31%
Residential Zone IV	Flats	560	316 *	28681.00m²	11.21%
Business Zone I	Shops, Shopping Centre	561 & 562	2	14682.00m²	5.74%
Institutional Zone I	School & Creché	563 & 564	2	39372.00m²	15.39%
Institutional Zone II	Place of Worship	565 & 566	2	1457.00m²	0.57%
Institutional Zone III	Health Clinic	567	1	1942.00m²	0.76%
Open Space Zone I	Public Parks	568 - 570	3	13389.00m²	5.23%
Transport Zone I	Roads	-	-	53163.00m²	20.78%
	TOTALS		885	255800.00m²	100.00%

drawing title
Proposed Framework Plan of Portion 7, Portion 8 & Portion 9 of Farm 432 Kranshoek

client
STATUS HOMES PROPERTY DEVELOPERS (PTY) LTD

Phasing Boundary

NOTES:
* Social Housing (Rental) is calculated @ 110 Units/Ha.

Other

Total Area in Ha:	25,58 Ha
Total Residential Zone I Area in Ha:	10,31 Ha
Total Residential Zone I & Residential Zone II Area in Ha:	13,18 Ha
Average Erf Size Residential Zone I:	184.00 m²
Gross Residential Density Residential Zone I:	21,90 Units/ha
Gross Residential Density Residential Zone I & Residential Zone II:	34,21 Units/ha

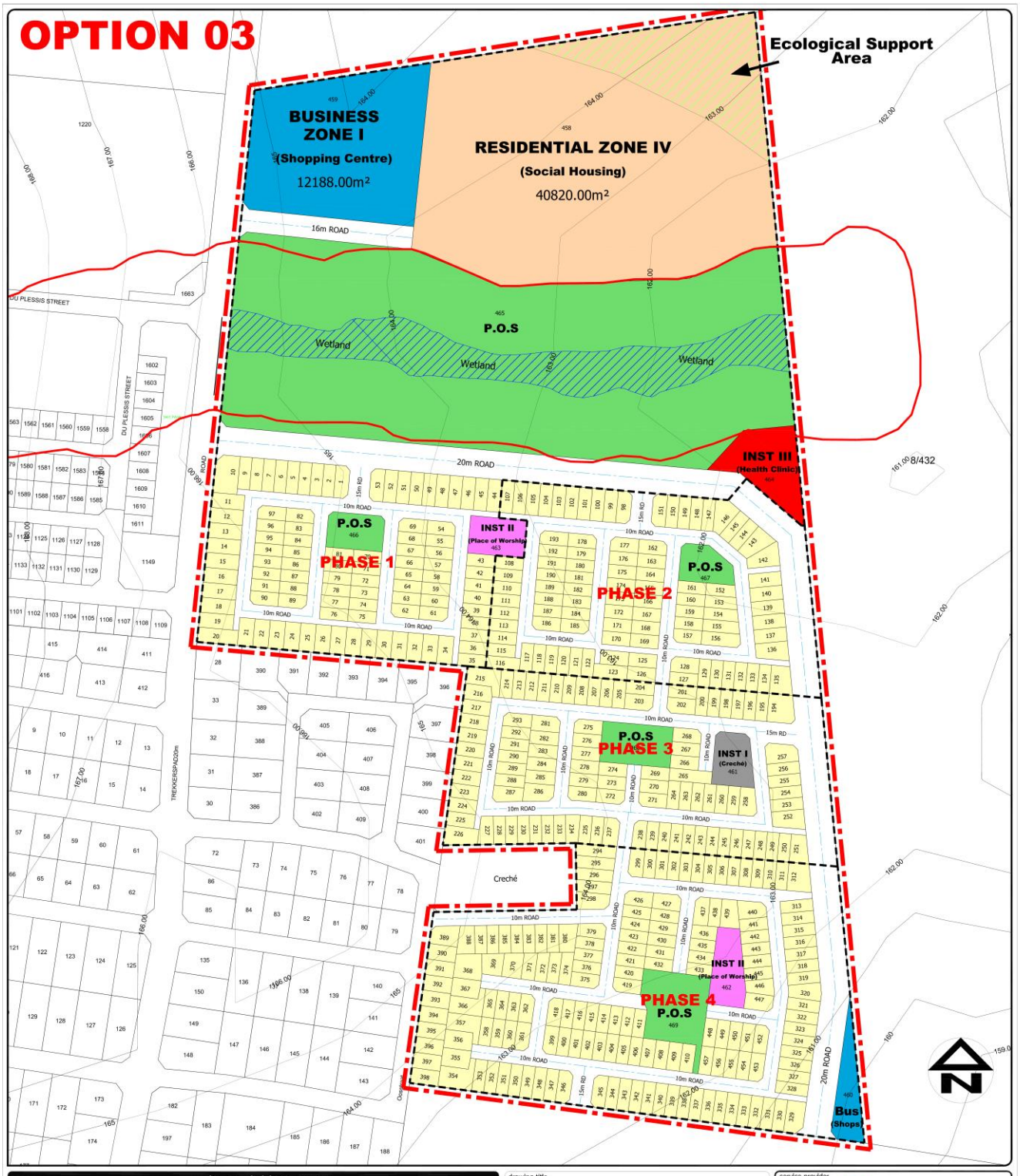
service provider
METROPLAN
TOWN AND REGIONAL PLANNERS
P.O. Box 12313, Centrahill, 6006 - 7 Upper Dickens Street, Central, Port Elizabeth, 6001 - Tel: +27 (041) 373-1843 Fax: +27 (041) 373-1838 E-mail: plan@mplan.co.za

drawn by	date	designed by	date
A. Human	31/08/18	L.A. Del Monte	31/08/18

scale
1 : 2 500 on A3

drawing number: 17008_Kra 12 revision: 1

APPENDIX B: REVISED SITE DEVELOPMENT PLAN (OPTION 03)



legend / key notes

Subject Site : 255800.00m²

Zoning	Land Use	Portion No.	No. of Units	Area in m²	% Allo
Residential Zone I	Dwelling Houses	1 - 457	457	89482.00m²	34.99%
Residential Zone IV	Flats	458	408 *	40820.00m²	15.96%
Business Zone I	Shops, Shopping Centre	459 & 460	2	13433.00m²	5.26%
Institutional Zone I	Creché	461	1	1015.00m²	0.40%
Institutional Zone II	Place of Worship	462 & 463	2	2255.00m²	0.89%
Institutional Zone III	Health Clinic	464	1	2415.00m²	0.95%
Open Space Zone I	Public Parks	465 - 469	5	56921.00m²	22.26%
Transport Zone I	Roads	-	-	49459.00m²	19.29%
	TOTALS		876	255800.00m²	100.00%

drawing title
Proposed Subdivision & Rezoning of Portion 9 of the Farm Kranshoek No. 432, Knysna Road

client
STATUS HOMES PROPERTY DEVELOPERS (PTY) LTD

Phasing Boundary

NOTES:
* Social Housing (Rental) is calculated @ 100 Units/Ha.

Other

Total Area in Ha:	25.58 Ha
Total Residential Zone I Area in Ha:	8.94 Ha
Total Residential Zone I & Residential Zone IV Area in Ha:	13.02 Ha
Average Erf Size Residential Zone I:	195.00 m²
Nett Residential Density Residential Zone I:	51.12 Units/ha
Gross Residential Density Residential Zone I:	17.87 Units/ha
Nett Residential Density Residential Zone IV:	100.00 Units/ha
Gross Residential Density Residential Zone IV:	33.82 Units/ha

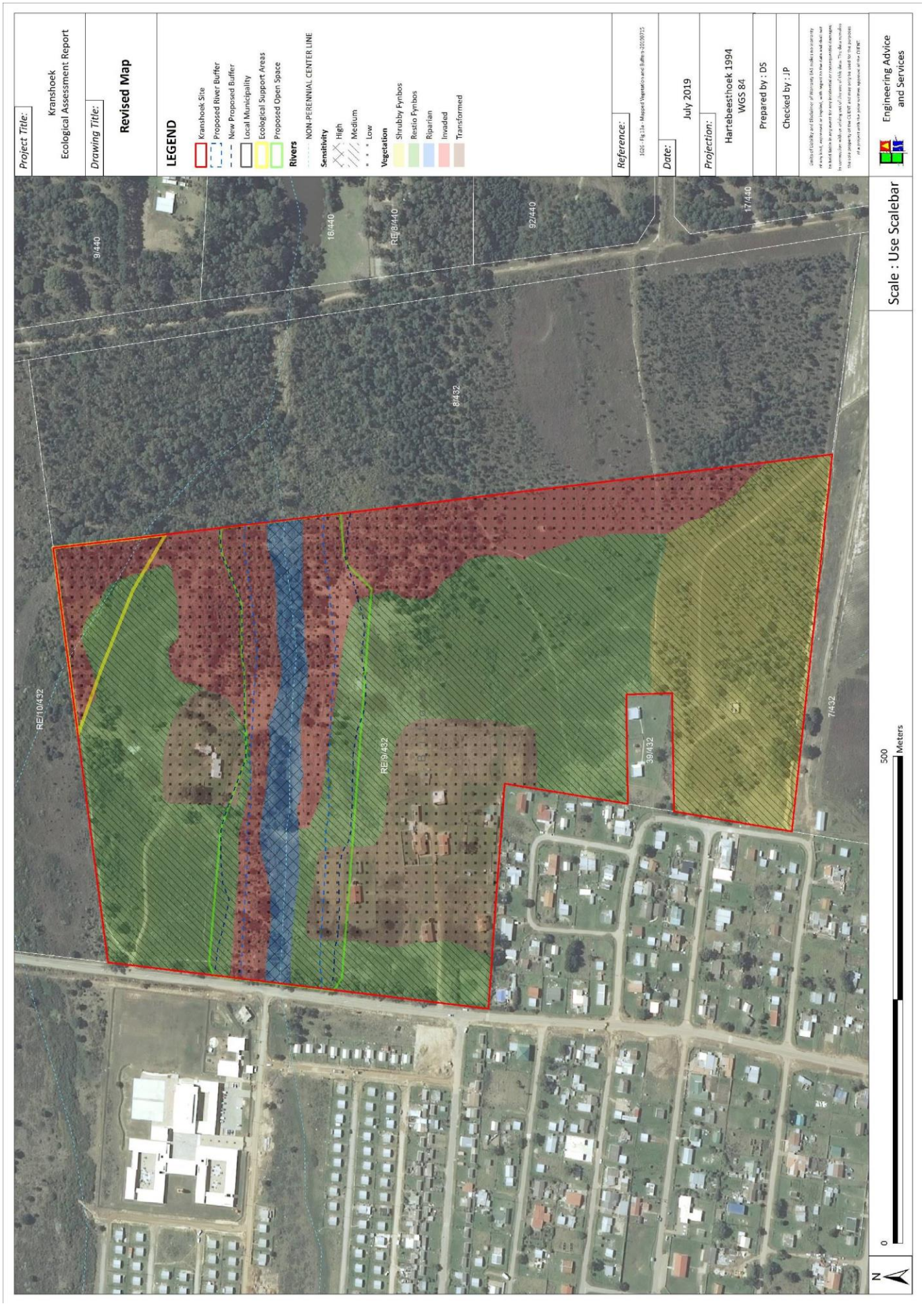
service provider
METROPLAN
TOWN AND REGIONAL PLANNERS
P.O. Box 12313, Centrahill, 6006 - 7 Upper Dickens Street, Central, Port Elizabeth, 6001 - Tel: +27 (041) 373-1843
Fax: +27 (041) 373-1838 E-mail: plan@mplan.co.za

drawn by	date	designed by	date
A. Human	08/07/19	L.A. Del Monte	08/07/19

scale: 1 : 2 500 on A3

drawing number: 17008_Kra 12 revision: 3

APPENDIX C: MAPPED VEGETATION AND REVISED PROPOSED OPEN SPACE



APPENDIX D: Western Cape Biodiversity Spatial (WC BSP) Guidelines Summary

The Western Cape Biodiversity Spatial Plan (WC BSP) is a spatial tool that forms part of a broader set of national biodiversity planning tools and initiatives that are provided for in national legislation and policy. It comprises the Biodiversity Spatial Plan (BSP) map of biodiversity priority areas, accompanied by contextual information and land use guidelines that make the most recent and best quality biodiversity information available for use in land use and development planning, environmental assessment and regulation, and natural resource management.

Critical Biodiversity Areas (CBAs)

Areas *that are required to meet biodiversity targets for species, ecosystems or ecological processes and infrastructure*. These include:

- All areas required to meet biodiversity pattern (e.g. species, ecosystems) targets;
- Critically Endangered (CR) ecosystems (terrestrial, wetland and river types);
- All areas required to meet ecological infrastructure targets, which are aimed at ensuring the continued existence and functioning of ecosystems and delivery of essential ecosystem services; and
- Critical corridors to maintain landscape connectivity.

CBAs are areas of high biodiversity and ecological value and need to be kept in a natural or near-natural state, with no further loss of habitat or species. Degraded areas should be rehabilitated to natural or near-natural condition. **Only low-impact, biodiversity-sensitive land uses are appropriate**.

Implications: No Critical Biodiversity Areas are affected within the site.

LAND USE CATEGORIES		Conservation		Agriculture		Tourism and Recreational Facilities		Rural Accomodation		Urban			Business & Industrial				Infrastructure Installations			
LAND USE SUB-CATEGORIES (Refer to table 4.7 for descriptions)		Proclaimed Protected Areas	Other Nature Areas	Intensive Agriculture	Extensive Agriculture	Low Impact Facilities	High Impact Facilities	Agri-worker Accomodation	Small holdings	Urban Development & Expansion	Community Facilities & Institutions	New Settlements	Rural Business	Non-place-bound Industry (low-moderate impact)	Non-place-bound Industry (high impact)	Extractive Industry (incl. Prospecting)	Linear – roads & rail	Linear – pipelines & canals	Linear – powerlines	Other Utilities
MAP CATEGORY	DESIRED MANAGEMENT OBJECTIVE	Y = Yes: Permissible land uses that are likely to compromise the biodiversity objective						R = Restricted: Land-uses that may compromise the biodiversity objective are only permissible under certain conditions (refer to Table 4.7 for conditions)					N = No: Land-uses that will compromise the biodiversity objective and are not permissible							
Protected Area	Must be kept in a natural state, with a management plan focused on maintaining or improving the state of biodiversity.	Land use within proclaimed protected areas are subject to management plan drawn up for that specific protected area.																		
Critical Biodiversity Area 1	Keep natural, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land-uses are appropriate.	Y	Y	N	R	N	N	N	N	N	N	N	N	N	N	N	N	N	R	N
Critical Biodiversity Area 2	Keep natural, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land-uses are appropriate.	Y	Y	N	R	R	N	N	N	N	N	N	N	N	N	N	R	R	R	N
Ecological Support Area 1: Terrestrial	Maintain in a functional, near-natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised.	Y	Y	N	R	R	N	N	N	N	N	N	R	R	N	N	R	R	R	R
Ecological Support Area 1: Aquatic	Maintain in a functional, near-natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised.	Y	Y	N	R	R	N	N	N	N	N	N	N	N	N	N	R	R	R	N
Ecological Support Area 2	Restore and/or manage to minimise impact on ecological infrastructure functioning; especially soil and water-related services.	Y	Y	N	R	R	N	N	R	N	N	N	N	N	N	N	R	R	R	R
ONA: Natural to Near-Natural	Minimise habitat and species loss and ensure ecosystem functionality through strategic landscape planning. Offers flexibility in permissible land-uses, but some authorisation may still be required for high impact land uses.	Y	Y	R	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
ONA: Degraded	Minimise habitat and species loss and ensure ecosystem functionality through strategic landscape planning. Offers flexibility in permissible land-uses, but some authorisation may still be required for high impact land uses.	R	R	R	Y	Y	R	R	Y	R	R	R	R	R	R	R	Y	Y	Y	Y
No Natural Remaining	These areas are suitable for development but may still provide limited biodiversity and ecological infrastructure functions and should be managed in a way that minimises impacts on biodiversity and ecological infrastructure.	R	R	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Ecological Support Areas (ESAs)

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. They support landscape connectivity, encompass the ecological infrastructure from which ecosystem goods and services flow, and strengthen resilience to climate change. They include features such as regional climate adaptation corridors, water source and recharge areas, riparian habitat surrounding rivers or wetlands, and endangered vegetation.

ESAs need to be maintained in at least a functional and often natural state, in order to support the purpose for which they were identified, but some limited habitat loss may be acceptable. A greater range of land uses over wider areas is appropriate, subject to an authorisation process that ensures the underlying biodiversity objectives and ecological functioning are not compromised. Cumulative impacts should also be explicitly considered.

Implications: A small portion of Ecological Support Area is identified along the north-eastern boundary. This area should be maintained as Open Space to protect ecological processes and connectivity with surrounding area (In line with guidelines).

Other Natural Areas (ONAs)

Areas that have not been identified as a priority in the current biodiversity spatial plan but retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Although they have not been prioritised for meeting biodiversity targets, they are still an important part of the natural ecosystem. ONAs should be managed or utilised in a manner that minimises habitat and species loss and ensures ecosystem functionality through strategic landscape planning. These 'other natural areas' offer considerable flexibility in terms of management objectives and permissible land uses, but some authorisation may still be required for high impact land uses.

The Western Cape Biodiversity Spatial Plan guidelines specify the following for Other Natural Areas for Urban development and expansion:
'*Minimise habitat and species loss and ensure ecosystem functionality through strategic landscape planning. Offers flexibility in permissible land uses, but some authorisation may still be required for high-impact land uses.'*

- These areas have the greatest flexibility in terms of management objectives and permissible land uses.
- Where possible, avoid modifying any remaining natural habitat by locating land uses, including cultivation and plantations, in already-modified areas.
- Authorisation may be required for high-impact land uses (such as intensive industry or urban development) and standard application of EIA regulations and other planning procedures is required.

These areas may still contain species of conservation concern but either have not yet been surveyed, or the data was not available for incorporation into the WCBSP. The *presence or absence of species of conservation concern* should always be established through site visits before proceeding with a land use change. *Recommendations of an appropriately qualified specialist must be followed in this regard.*

Existing settlements and urban expansion
Includes: Metropolitan areas, cities, larger towns, small towns, villages and hamlets. Assumes the following conditions/controls:

- The control of urban expansion through the delineation of an urban edge to prevent urban sprawl.
- The delineation process is guided by the provincial urban edge guideline document and informed by the Western Cape Biodiversity Spatial Plan, for example a Critical Biodiversity Area Map is used to delineate a boundary of the urban edge.
- The promotion of compact urban settlements, whilst maintaining an open space system (where possible) that is informed by a fine-scale biodiversity plan or map.

Implications: A small portion of Other Natural Area is identified within the site.

- *The site is located directly adjacent to an existing urban area.*
- *The vegetation type is well conserved regionally and has a widespread distribution.*
- *The vegetation on site is comprised of a mozaic of near-natural, degraded and transformed vegetation with some alien infestation (predominantly Pine).*
- *The vegetation on site has a low species diversity compared to surrounding areas.*
- *Species of Conservation Concern are generally absent from the site and thus has a low potential contribution to conservation.*

Retention of a buffer around the drainage lines as well as the north-eastern portion (Ecological Support Area) as Open Space as well as the overall development of a 'compact urban settlements, whilst maintaining an open space system' thus means that the proposed development is possible whilst meeting the guideline recommendations.