



DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

In terms of the **National Environmental Management Act** (Act No. 107 of 1998, as amended) & 2017 Environmental Impact Regulations for:

Proposed Residential Development on Portion 91 of Farm Matjes Fontein 304, Keurboomstrand, Plettenberg Bay, Western Cape Province.

DEA&DP REF: 16/3/3/1/D1/13/0001/25



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30/07/2025

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EAP Signature: _____



ENVIRONMENTAL MANAGEMENT PROGRAMME REQUIREMENTS:

Appendix 4 of Regulation 982 of the 2014 EIA Regulations contains the required contents of an Environmental Management Programme (EMP). The table below serves as a summary of how these requirements were incorporated into this EMPR:

(1) An EMPr must comply with section 24N of the Act and include:

<p>(a) Details of –</p> <ul style="list-style-type: none"> (i) The EAP who prepared the EMPr; and (ii) The expertise of the EAP to prepare an EMPr, including a curriculum Vitae; 	<p>This EMPr was prepared by Joclyn Marshall of Eco Route Environmental Consultancy.</p> <p>Please see attached CV of EAP (Annexure A).</p>
<p>(b) A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;</p>	<p>Section 2 provides specific project details.</p>
<p>(c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;</p>	<p>Annexure F provides mapping which superimpose the proposed activity onto environmentally sensitive areas.</p>
<p>(d) A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including –</p> <ul style="list-style-type: none"> (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and where applicable post closure; and (v) where relevant, operation activities; 	<p>Addressed in Sections 3, 4 and 10.</p>
<p>(f) a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to –</p> <ul style="list-style-type: none"> (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) comply with any prescribed environmental management standards or practises; (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and (iv) comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable; 	<p>Addressed in Sections 3, 4 and 10.</p>

(g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Addressed in Section 10.
(h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 7.1 and 10.
(i) an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 5 and 10.
(j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Sections 10.
(k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 10.
(l) a program for reporting on compliance, taking into account the requirements as prescribed by Regulations;	Section 7.
(m) an environmental awareness plan describing the manner in which – (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 7 and 10.
(n) any specific information that may be required by the competent authority.	Sections 10 and 14.

Glossary of Terms

BAR	Basic Assessment Report – A tool used by the EAP to submit to the competent authority if listed activities is triggered in Regulations GNR 327 and GNR 324 as per NEMA to make a decision regarding a proposed development.
DFFE	Department Forestry Fisheries and Environment – the national authority for sustainable environmental management and integrated development planning.
DFFE&DP	Department of Environmental Affairs and Development Planning – the provincial authority for sustainable environmental management and integrated development planning.
CBA	CBA Critical Biodiversity Area – Areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure.
EAP	<p>Environmental Assessment Practitioner – An EAP and a specialist, appointed in terms of regulation 12(1) or 12(2) must –</p> <ul style="list-style-type: none"> (a) be independent. (b) Have expertise in conducting environmental impact assessments or undertaking specialist work as required, including knowledge of the Act, these regulations and any guidelines that have relevance to the proposed activity. (c) Ensure compliance with these Regulations (d) Perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the application. (e) Take into account, to the extent possible, the matters referred to in regulation 18 when preparing the application and any report, plan or document relating to the application; and (f) Disclose to the applicant or applicant, registered and affected parties and the competent authority all material information in the possession of the EAP and, where applicable, the specialist, that reasonably has or may have the potential of influencing – <ul style="list-style-type: none"> i. Any decision to be taken with respect to the application by the competent authority in terms of these regulations; or ii. The objectivity of any report, plan or document to be prepared by the EAP or specialist, in terms of these Regulations for submission to the competent authority; unless access to that information is protected by law, in which case it must be indicated that such protected information exists and is only provided to the competent authority. <p>(2) In the event where the EAP or specialist does not comply with sub regulation (1)(a), the applicant or applicant must, prior to conducting public participation as contemplated in chapter 5 of these regulations, appoint another EAP or specialist to externally review all work undertaken by the EAP or specialist, at the applicants cost.</p> <p>(3) An EAP or specialist appointed to externally review the work of an EAP or specialist as contemplated in sub regulation (2), must comply with sub regulation (1).</p>
ECO/ESO	Environmental Control Officer – A site agent who needs to ensure that all environmental authorisation and conditions are adhered to during the construction phase of the project
EMPr	Environmental Management Programme – can be defined as “an environmental management tool used to ensure that undue or reasonably avoidable adverse

	impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced".
ESA	Ecological Support Area – 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.
MMP	Maintenance Management Plan – means a maintenance management plan for maintenance purposes defined and adopted by the competent authority
NEMA	National Environmental Management Act (Act 107 of 1998) as amended 2017 – national environmental legislation that provides principles for decision-making on matters that affect the environment.
PA	Protected Area - A protected area is an area of land or sea that is formally protected by law and managed mainly for biodiversity conservation. Protected areas recognised in the National Environmental Management: Protected Areas Act (Act 57 of 2003) (hereafter referred to as the Protected Areas Act) are considered formal protected areas in the NPAES. This is a narrower definition of protected areas than the International Union for Conservation of Nature (IUCN) definition. ¹ The NPAES distinguishes between land-based protected areas, which may protect both terrestrial and freshwater biodiversity features, and marine protected areas.

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1. INTRODUCTION

In accordance with the Integrated Environmental Management Guidelines published by the Department of Forestry, Fisheries and the Environment (DFFE) in 1992, the purpose of an Environmental Management Programme (EMPr) is "to describe how negative environmental impacts will be managed, rehabilitated or monitored and how positive impacts will be maximised".

Section 28 of NEMA (National Environmental Management Act, Act 107 of 1998) states that:

Duty of care and remediation of environmental damage -

"(1) Every person who causes, has caused, or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot be reasonably avoided or stopped, to minimise and rectify such pollution or degradation of the environment"

This EMPr must be read in conjunction with the Environmental Impact Assessment Report dated October 2022 and the accompanying specialist reports. All recommendations, relevant conditions and mitigation measures provided in these documents must also be adhered to.

This EMPr must form an integral part of the contract documents, as it outlines the methodology & duties required so that the project objectives can be achieved in an environmentally sustainable manner; with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with this project. These requirements will have a financial impact on the project's costings.

This EMPr is a dynamic document that may need to evolve during its implementation period so that it recognises any new issues that may arise; or changes in the parameters of identified issues and can address these issues with the required/amended mitigation.

1.1. Purpose of the EMPr

The purpose of this EMPr is to ensure that the negative environmental impacts of the proposed activities are managed, mitigated and kept to a minimum during the planning, construction and operation of the proposed housing development. The EMPr focuses on avoiding damage or loss on ecosystems and the services they provide, and to enhance positive environmental impacts where possible.

The EMPr is a living document that is flexible and responsive to new and changing circumstances, however, should a change be made within the EMPr permission from DEA&DP must first be obtained.

Once the EMPr is approved by DEA&DP it is seen as a legal binding document on the following affected parties:

- 1 Project Applicant.
- 2 All contractors.
- 3 Sub-contractors and construction staff.
- 4 Site Manager.
- 5 The appointed ECO monitoring the construction phase.

Copies of this EMPr must be kept on site and all senior personnel are expected to familiarise themselves with the content of this EMPr.

It is suggested that the EMPr be reviewed on a 5 yearly basis if required. Should any amendments need to be made during operational phase, written authorisation should be obtained from DEA&DP.

1.2. The Polluter-Pays Principle

This principle provides for “the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.” The Polluter Pays Principle will be rigorously applied throughout the construction phase of this project.

2. PROJECT DETAILS

Eco Route Environmental Consultancy has been appointed by the applicant **Familie Roux Eiendomme Pty** to prepare an Environmental Management Programme (EMPr) in compliance with the Basic Assessment Report Conditions set by Department of Environmental Affairs and Development Planning (DEA&DP) Western Cape Provincial Government, for Environmental Authorisation.

Portions 91 of the Farm Matjes Fontein 304 is situated in the Keurboom area in the Bitou Municipal Area to the northeast of Plettenberg Bay. The property can be accessed directly from Keurboom Road (Minor Road PO349 Rd) which connects with the N2 via Divisional Road DR1888. The site is approximately 1.8km west of Keurboomstrand (figure 1). This site is presently used for a horse-riding center and is directly opposite the Milkwood Glen Residential Complex, which consists of about 50 Group Housing erven and communal open space.

The vision of this development is to create an affordable and sustainable housing product specifically targeting the middle-income group. The aim is to create a pleasant yet affordable residential neighbourhood where the average person can own a home and live with dignity. The architecture will be based on green principles which will include smaller but well-designed houses, which are more cost-efficient, energy-efficient and healthy. The proposed development includes 60 single residential house stands with average erf sizes of $\pm 500\text{m}^2$. The houses will vary in size but will be built in a similar style that will create a harmonious development. Ample open spaces and landscaped streets are incorporated into the design to enhance the quality of the neighbourhood.

The proposed open space system is made up of 9 642m² within the development footprint and 83 512m² of the remaining area. The open space areas within the development will be zoned as Open Space II and correspond to the position of indigenous vegetation, forest, and milkwood trees. The communal open space II area will incorporate landscaped gardens and stormwater infiltration ponds systems. Should it be required, excess effluent will be discharged to the stormwater infiltration ponds system. This will be environmentally acceptable, the effluent being to DWS Special Limits quality. These areas will be part of the landscaping plan of the development and will provide an opportunity for recreational areas such as walking trails, lookout points etc. A play park and picnic area are planned under the Milkwood trees and the small dam can be equipped with a bird hide or benches where the resident can enjoy the greenery.

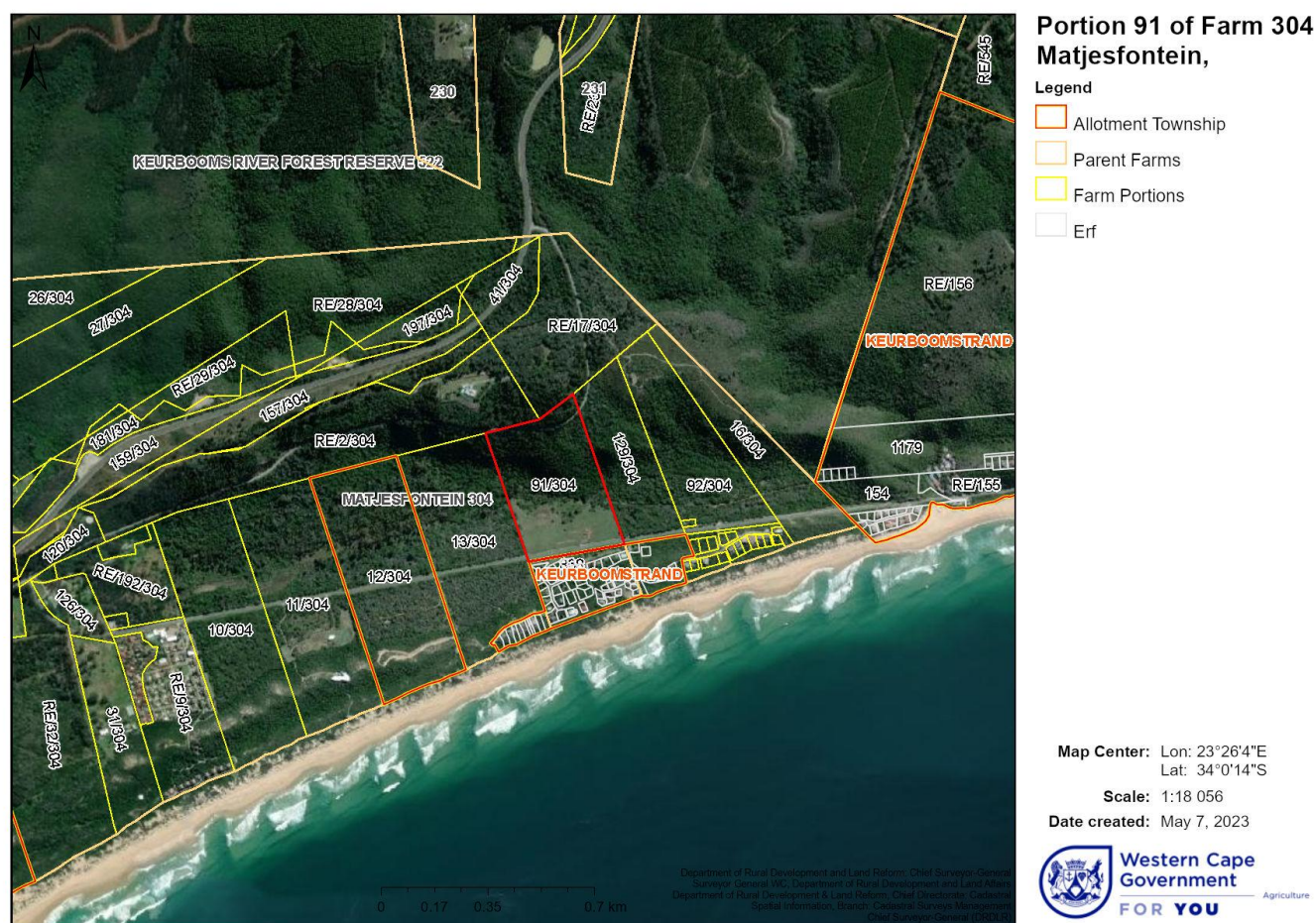
The remaining undeveloped 83 512m² will be zoned as Open Space III and will be managed as a conservation area in accordance with a Conservation Management Plan (Appendix L). The conservation area also incorporates an ecological corridor for wildlife movement and the historical fountain. The ecological corridor will run between the west and east boundary of the property along the foot of the slope and creates a buffer zone of 20 meters between the development and the forest area. In addition to the wildlife benefitting from this 20 m corridor, the slope base is also then protected in terms of groundwater recharge

The engineer is responsible for monitoring the compliance of the contractor to the approved EMPr. To assist the Engineer and to bring environmental expertise to his team, it is required that the Engineer appoints an appropriately qualified Environmental professional with expertise in EMPr's to act as the Environmental Control Officer (ECO) for the project.

2.1. Site Description

Erf Number:	Portion 91 (a portion of portion 14) of the Farm Matjes Fontein 304
Area:	17.72 Ha
SG Code:	C03900000000030400091
Co-ordinates:	34° 05 '24" S 23° 22' 13" E
Local Municipality	Bitou Local Municipality
District Municipality	Garden Route District Municipality

2.2. Locality



2.3. Key Issues

These are issues of importance and should be addressed during the Construction and Development Phases as well as the future management of the property and included in the *Home Owners / Resident and Rate Payers Constitutions*.

The relevant Key Issues with regard to the Receiving Environment include:

- ❖ **Forest habitats** on the upland, steeply-sloping part of the site, have high biodiversity and conservation value, and are designated as sensitive. These areas must not be affected by the proposed development. A buffer zone of 20 meters will be retained along the base of the slope to protect the

forest margin. For example, steps should be taken to rehabilitate these areas and encourage growth of species, such as *Pterocelastrus tricuspidatus* and *Sideroxylon inerme*, that are mesic and fire-resistant. An open space management system should be developed to formalize such steps for forest protection.

- ❖ No plant species of concern were found on site, but a small number of free-standing, relatively large **milkwood trees** (*Sideroxylon inerme*) were found on site that are protected under the National Forests Act. These will be retained within the proposed development.
- ❖ The **dam and associated spring** are identified as a watercourse as defined in the National Water Act. The mapped spring and dam have been protected by a 10 m buffer as recommended, which constitutes the regulated area as per GN509 as this incorporates riparian vegetation in the immediate vicinity of the features.
- ❖ The property is located on the edge of the 1:100 year floodline, which is not mapped to extend beyond the boundary of the property. In reality, the frequency of 100-year flood events is increasing due to climate change, and when coincident with sea-level rise and high tide events, it is not impossible that minor flooding could affect the low-lying area of the property in future. This should be considered in the design and layout of the property, and **stormwater management** should not further exacerbate the flood risk. To this end, Sustainable Drainage Systems (SuDS) should be fully implemented. The system should lead run off water away from sensitive areas, in order to prevent soil erosion and contamination. The use of grass blocks on paved driveways, roadway kerb and channel side drain, and retention ponds to assist percolations of stormwater.
- ❖ **Sedimentation and pollutant runoff** from the development during construction may impact the dam and associated spring and its buffer area.
- ❖ **Removal of topsoil** must only be allowed in the disturbance area and undertaken prior to commencement of construction activities and stored for later use during the Rehabilitation Phase of the development. This will largely determine the success and rate of rehabilitation.
- ❖ Allow for the maintenance of **animal movement** through the creation of open space links to the forest area. The preferred layout includes a 20m buffer along the forest margin and also incorporates portions of the secondary vegetation area to form part of the open space system within the development, which will link up with the forest area. the 20m wide buffer runs along the forest and foothill to allow for animal movement along the foothill of the ridge. Wherever fences are needed in the development area and on its boundary, it will be necessary to ensure that wildlife can move through the fences to enable their movement across the landscape. This can be achieved with wildlife gaps strategically placed in the fence.
- ❖ **Alien plant infestation** impacting biodiversity and ecological processes. An ongoing alien invasive management programme should take place on site. This will protect riparian habitats downslope from degradation and could potentially be the biggest contribution to maintaining and protecting biodiversity on site and in surrounding areas.
- ❖ **Fire risk** mostly posed by alien vegetation. The removal of the alien vegetation will mitigate fire risk to a large extent. There must be well-placed/planned defensible spaces around the structures/houses which will offer additional structural protection against possible wildfires moving into the development. These defensible spaces should be properly maintained. Highly burnable vegetation or flammable material should not be present within these defensible spaces. The road network within the development will also limit any spread of fires within the proposed development. It cannot be expected landowners/homeowners to make provision for extreme wildfire events.
- ❖ **Erosion** due to removal of organic rich topsoil and disturbance of vegetation during construction. Areas that are disturbed through building activities (such as the excavations for pipelines) should be suitably rehabilitated without delay. Failure to do so will have a knock-on effect on biodiversity in the

form of soil exposure and a loss of the soil micro-organisms that are essential for plant growth. The disturbed open space areas will be rehabilitated with indigenous vegetation.

- The **preservation of natural habitats**. Wherever there are sections of undisturbed natural habitat within the development area, they should not be impacted by the building activities and should be conserved as small islands of natural resources for the small wildlife of the area. Any area of natural habitat that is not required for the approved development should be conserved for small wildlife. Rehabilitation of disturbed areas, as well as previously invaded areas, should promote establishment of site-appropriate indigenous species.

3. IMPACTS ASSOCIATED WITH THE PLANNING/DESIGN, CONSTRUCTION AND OPERATION OF THE ACTIVITY

3.1. Assessment Criteria

Each potential environmental impact and risk identified was assessed according to specific criteria. These included the nature, extent, duration, consequence, probability and frequency of identified impacts, including the degree to which these impacts can be reversed, may cause irreplaceable loss of resources, and can be avoided, managed or mitigated. The criteria are based on the EIA Regulations, published by the Department of Forestry, Fisheries and the Environment (April 1998) in terms of the Environmental Conservation Act No. 73 of 1989. These criteria include:

Nature of the impact

This is an estimation of the type of effect the construction, operation and maintenance of a development would have on the affected environment. This description should include what is to be affected and how.

Mitigation Measures

Ways in which an impact can be avoided, minimised, or managed to reduce its environmental significance.

Extent of the impact - the scale of the impact	
Rating	Definition of Rating
Very Limited	Extending only as far as the development site area
Limited	Limited to the site and its immediate surroundings
Local	Extending across the site and to nearby settlements
Regional	The region, which may be defined in various ways, e.g. cadastral, catchment, topographic.
National	National scale or across international borders

Duration of the impact - the lifespan or length of time the impact will last	
Rating	Definition of Rating
Brief	Impact will not last longer than 1 year

Short term	Impact will last between 1 and 2 years
Medium Term	Impact will last between 2 and 15 years
Long Term	Impact will last more than 15 years
Permanent	Impact may be permanent, or in excess of 20 years
Very High	Natural and/ or social functions and/ or processes are severely altered

Intensity - the severity of the impact	
Rating	Definition of Rating
Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Low	Natural and/or social functions and/or processes are slightly altered
Medium	Natural and/or social functions and/or processes are notably altered
High	Natural and/ or social functions and/ or processes are significantly altered
Very High	Natural and/ or social functions and/ or processes are severely altered

Probability of occurrence - the probability of the impact occurring	
Rating	Definition of Rating
Improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere
Possible	Has occurred here or elsewhere and could therefore occur
Probable	It is most likely that the impact will occur
Definite	There are sound scientific reasons to expect that the impact will occur

Reversibility - the ability of the impacted environment to return to its pre-impacted state	
Rating	Definition of Rating
Completely reversible	the impact can be reversed with the implementation of minor mitigation measures.
Partly reversible	the impact is reversible but more intense mitigation measures are required
Barely reversible	the impact is unlikely to be reversed even with intense mitigation measures
Irreversible	the impact is irreversible, and no mitigation measures exist

Irreplaceable loss of resources - the degree to which resources will be irreplaceably lost	
Rating	Definition of Rating
Negligible	No loss of resources
Low	Marginal loss, the resource is not damaged irreparably or is not scarce
Medium	the resource is damaged irreparably but is represented elsewhere
High	Irreparable damage and is not represented elsewhere

Confidence - the level of confidence in the assessment rating	
Low	Judgement is based on intuition
Medium	Determination is based on common sense and general knowledge
High	Substantive supportive data exists to verify the assessment

Significance - Significance of impacts are determined through a synthesis of the assessment criteria		
Rating		Definition of Rating
	Major negative (-)	The impact will have highly significant effects and are unlikely to be able to be mitigated adequately
	Moderate negative (-)	The impact will have medium significant effects and will require moderate mitigation measures to achieve an accepted level of impact
	Minor negative (-)	The impact will have low significant effects and will require minor mitigation
	Negligible negative (-)	The impact will have very low significant effects and would require little mitigation
	Neutral	The impact will have insignificant effects and would require no mitigation
	Negligible positive (+)	The impact will have negligible positive effects
	Minor positive (+)	The impact will have minor positive effects
	Moderate positive (+)	The impact will have moderate positive effects
	Major positive (+) High	The impact will have highly significant positive effects.

3.2. Impacts foreseen during the Construction Phase

Project Phase	Construction			
Activity	Loss of habitat within CBAs			
Description of impact	Encroachment into and loss of CBA1 and CBA2 areas due construction.			
Mitigable	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	<ul style="list-style-type: none">Some form of offset or conservation servitude can be considered.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Low negative	
Duration	Permanent	Impact may be permanent, or in excess of 20 years	Permanent	Impact may be permanent, or in excess of 20 years
Extent	Limited	Limited to the site and its immediate surroundings	Limited	Limited to the site and its immediate surroundings
Intensity	Medium	Natural and/or social functions and/or processes are notably altered	Low	Natural and/or social functions and/or processes are somewhat altered
Probability	Definite	There are sound scientific reasons to expect that the impact will occur	Definite	There are sound scientific reasons to expect that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment

Reversibility	Completely reversible	the impact can be reversed with the implementation of minor mitigation measures.	Completely reversible	the impact can be reversed with the implementation of minor mitigation measures.
Resource irreplaceability	Medium	the resource is damaged irreparably but is represented elsewhere	Medium	the resource is damaged irreparably but is represented elsewhere
Significance	Minor - negative		Minor - negative	
Comment on significance	The site occurs entirely within CBA1 and CBA2 areas. The secondary vegetation ("pastures") in the southern part of the site does not have the properties consistent with protecting biodiversity patterns, but remaining areas are ecologically functional. The vegetation on site (within the proposed development footprint) is in relatively poor condition, and consists either of lawns or secondary vegetation with a species composition that is not representative of the natural habitat			
Cumulative impacts	The impact would result in insignificant cumulative effects as the significance of the impacts is low. The CBAs are designated for the protection of listed Garden Route shale fynbos, but this does not occur within these designated CBA1 areas, only forest.			

Project Phase	Construction			
Activity	Clearance of vegetation for the construction of the dwelling and associated infrastructure			
Description of impact	Loss of sensitive vegetation, habitat loss for terrestrial wildlife, mortalities to various species unable to evade the disturbance, loss of viable propagules, fragmentation of ecological infrastructure			
Mitigable	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	<ul style="list-style-type: none">Wherever there are sections of undisturbed natural habitat within the development area, they must not be impacted by the building activities and must be conserved as small islands of natural resources for the small wildlife of the area.the removal and translocation of protected plants if found must be undertaken prior to construction clearing activities. A permit is required prior to removal.Protected plants must either be moved to a safer, no-go area on the property or taken to a nursery for temporary storage until rehabilitation takes place.Access by heavy machinery must be limited on the site.Only areas necessary for the development footprint must be cleared and the remainder of the property must be left natural.Laydown areas for construction materials must be contained within the clearing footprint of the proposed development.A 20-meter buffer zone must be retained along the base of the slope to protect the forest margin.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Low negative	
Duration	Permanent	Impact may be permanent, or in excess of 20 years	Permanent	Impact may be permanent, or in excess of 20 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to the site and its immediate surroundings
Intensity	High	Natural and/ or social functions and/ or processes are significantly altered	Low	Natural and/or social functions and/or processes are somewhat altered
Probability	Definite	There are sound scientific reasons to expect that the impact will occur	Probable	Has occurred here or elsewhere and could therefore occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment

Reversibility	Irreversible	the impact is irreversible, and no mitigation measures exist	Partly reversible	the impact is reversible but more intense mitigation measures are required
Resource irreplaceability	Medium	the resource is damaged irreparably but is represented elsewhere	Low	Marginal loss, the resource is not damaged irreparably or is not scarce
Significance	Minor - negative		Negligible - negative	
Comment on significance	The forested area to the north of the development is excluded from the proposed development and will not be directly affected.			
Cumulative impacts	The impact would result in insignificant cumulative effects			

Project Phase	Construction			
Activity	Loss of secondary vegetation within endangered ecosystem			
Description of impact	Loss of habitat on site (within the proposed development footprint), modification of ecological processes, spillover effects into surrounding areas due mostly to secondary impacts such as boundary disturbance and alien invasive species spread.			
Mitigable	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	<ul style="list-style-type: none">Access to forested areas during construction must not be permitted by any construction personnel. These areas must be fenced off and no access allowed.Compile and implement an alien management plan, which highlights control priorities and areas and provides a programme for long-term control.Undertake regular monitoring to detect alien invasions early so that they can be controlled, as per the Alien Management Plan.Rehabilitation of disturbed areas, as well as previously invaded areas, must promote establishment of site-appropriate indigenous species.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Low negative	
Duration	Permanent	Impact may be permanent, or in excess of 20 years	Permanent	Impact may be permanent, or in excess of 20 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to the site and its immediate surroundings
Intensity	Medium	Natural and/or social functions and/or processes are notably altered	Low	Natural and/or social functions and/or processes are somewhat altered
Probability	Certain / Definite	There are sound scientific reasons to expect that the impact will definitely occur	Certain / Definite	There are sound scientific reasons to expect that the impact will definitely occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Low	The affected environment will not be able to recover from the impact - permanently modified	Medium	The affected environment will only recover from the impact with significant intervention
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Minor - negative		Negligible - negative	
Comment on significance	The vegetation type (Garden Route Shale Fynbos) is listed as Endangered. All upland areas of the site on the steep slopes are covered with forest that matches the description for Southern Afrotemperate Forest, which is not threatened, but is separately listed as protected under the National Forests Act. The forest areas on site fall within a CBA1. These forested areas are completely excluded from the proposed development (both options) and are not directly affected. The only remaining non-forest vegetation on site is considered to be secondary. However, on the basis that no legal soil disturbance has occurred during the preceding 10 years, it			

	is legally considered to be natural vegetation that is within an Endangered ecosystem. It is, however, not representative of this vegetation unit and, being secondary, is not considered to be irreplaceable.
Cumulative impacts	The impact would result in insignificant cumulative effects

Project Phase	Construction			
Activity	Loss of individuals of protected tree species			
Description of impact	Loss of habitat on site (within the proposed development footprint), disturbance or loss of protected trees.			
Mitigable	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	<ul style="list-style-type: none">Retain existing large trees within proposed development.If any trees need to be removed or pruned then a permit is required, according to the National Forests Act.Plant additional milkwoods in the development as part of the final landscaping. These can be planted along with other appropriate coastal forest species, but the proportions and composition must reflect habitat that would have occurred naturally at this site.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Low negative	
Duration	Permanent	Impact may be permanent, or in excess of 20 years	Long Term	Impact will last between 16 and 30 years
Extent	Very limited	Limited to the site and its immediate surroundings	Very limited	Limited to the site and its immediate surroundings
Intensity	Very high	Natural and/ or social functions and/ or processes are majorly altered	Low	Natural and/or social functions and/or processes are somewhat altered
Probability	Probable	Has occurred here or elsewhere and could therefore occur	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	Partly reversible	The impact is reversible but more intense mitigation measures are required	Partly reversible	The impact is reversible but more intense mitigation measures are required
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Minor - negative		Negligible - negative	
Comment on significance	The tree species affected is <i>Sideroxylon inerme</i> , protected under the National Forests Act. A total of 4 individuals were seen on site, all of them relatively large individuals. The species is widespread but is a key and dominant component of coastal forests in the Garden Route.			
Cumulative impacts	The impact would result in insignificant cumulative effects			

Project Phase	Construction			
Activity	Loss of habitat for listed threatened animal species			
Description of impact	Loss of habitat for threatened plant and animal species, spillover effects into surrounding areas due mostly to secondary impacts such as dust deposition and alien invasive species spread.			
Mitigable	Medium	Mitigation exists and will notably reduce significance of impacts		

Potential mitigation	<ul style="list-style-type: none">Protect natural forest vegetation adjacent to the proposed development site.Rehabilitate and improve the small dam on site, including introducing pond margin vegetation typical of mountain ponds in forested areas. This will provide good habitat for various frogs, including potentially <i>Africalus knysnae</i>.Forest habitats on the upland, steeply-sloping part of the site, have high biodiversity and conservation value, and are designated as sensitive. These areas must not be affected by the proposed development. A buffer zone must be retained along the base of the slope to protect the forest margin. For example, steps must be taken to rehabilitate these areas and encourage growth of species such as <i>Pterocelastrus tricuspidatus</i> and <i>Sideroxylon inerme</i>, that are mesic and fire-resistant.An open space management system must be developed to formalize steps for forest protection.			
Assessment	Without mitigation			With mitigation
Nature	Negative		Low negative	
Duration	Permanent	Impact may be permanent, or in excess of 20 years	Permanent	Impact may be permanent, or in excess of 20 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to the site and its immediate surroundings
Intensity	Very high	Natural and/ or social functions and/ or processes are majorly altered	Low	Natural and/or social functions and/or processes are somewhat altered
Probability	Probable	Has occurred here or elsewhere and could therefore occur	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	Partly reversible	The impact is reversible but more intense mitigation measures are required	Partly reversible	The impact is reversible but more intense mitigation measures are required
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Minor - negative		Negligible - negative	
Comment on significance	<ul style="list-style-type: none">There is habitat on site that is suspected habitat for threatened plant and animal species. This is the forest habitat, which is outside the proposed development footprint and will not be affected by the proposed development.The species that could potentially occur within this habitat are as follows:<ul style="list-style-type: none">Knysna Warbler (Vulnerable) has a moderate probability of occurring in forest margin areas.Crowned Eagle (Near Threatened) - the forests on site may constitute part of the general foraging range but it is unlikely that they are resident on site, or are dependent on it.Tunnelling Dung Beetle (Endangered). The type locality of the species is forest habitats in the Keurboomstrand area.Small antelope (Vulnerable). There is a moderate to high probability of it occurring in the forests on site.			
Cumulative impacts	The potential impact affects a negligible proportion of the overall habitat available for these species and will not directly affect any individuals.			

Project Phase	Construction			
Activity	Earthworks and vegetation clearing for construction activities			
Description of impact	Sedimentation of the pond resulting in poor water quality. Destruction of vegetation around the pond and spring.			
Mitigable	High	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	<ul style="list-style-type: none">❖ Pre-construction erect temporary fencing along the entire green corridor and open space to protect the pond as well as the corridor from impact during construction.❖ Add signage to the fence indicating the area as No-Go.❖ Site inductions for all staff must ensure contractors and works area aware they may not enter the pond and spring area.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Low negative	
Duration	Short term	Impact will last between 1 and 2 years.	Brief	Impact will not last longer than 1 year.
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to the site and its immediate surroundings
Intensity	Low	Natural and/or social functions and/or processes are somewhat altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Possible	Has occurred here or elsewhere and could therefore occur	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	Completely reversible	The impact can be reversed with the implementation of minor mitigation measures.	Completely reversible	The impact can be reversed with the implementation of minor mitigation measures.
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Minor - negative		Negligible - negative	
Comment on significance	While a natural spring and pond are present on the site, they are very small in extent and can be adequately protected from the development by implementing the 10m buffer during the construction and operational phases as indicated in this report. The presence of this feature is not sufficient to increase the sensitivity of the site to Very High, and it has been excluded from the development area. No stormwater must be put into this pond as the water is of high quality.			
Cumulative impacts	The impact would result in insignificant cumulative effects.			

Project Phase	Construction	
Activity	Waste Pollution	
Description of impact	Pollution of buffer zones and natural areas caused by waste generated by the construction process.	
Mitigable	High	Mitigation exists and will considerably reduce significance of impacts
Potential mitigation	<ul style="list-style-type: none">• All construction waste generated on-site during construction must be adequately managed. Separation and recycling of different waste materials must be supported.• All construction waste materials must be collected and disposed of at a suitable waste facility.• No dumping of construction material within natural areas or buffer zones may take place.	

	<ul style="list-style-type: none">• The buffer and “no-go” areas must be monitored on a weekly basis to clean-up any waste that may have been blown from the construction site.• Adequate sanitary facilities and ablutions must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation).			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Low negative	
Duration	Short term	Impact will last between 1 and 5 years	Brief	Impact will not last longer than 1 year
Extent	Very limited	Limited to the site and its immediate surroundings	Very limited	Limited to the site and its immediate surroundings
Intensity	Low	Natural and/or social functions and/or processes are somewhat altered	Very low	Natural and/or social functions and/or processes are slightly altered
Probability	Likely	The impact may occur	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Negligible - negative		Negligible - negative	
Comment on significance	Construction activities are likely to generate significant quantities of solid waste that could pollute buffer zones and natural areas. In addition, the high numbers of construction workers present on site will generate a significant amount of human waste, which could pollute the environment.			
Cumulative impacts	The impact would result in insignificant cumulative effects.			

Project Phase	Construction	
Activity	Construction Vehicles	
Description of impact	Pollution caused by the operation of vehicles and heavy machinery.	
Mitigable	High	Mitigation exists and will considerably reduce significance of impacts
Potential mitigation	<ul style="list-style-type: none">Construction activities must be confined to clearly demarcated areas so as to prevent unnecessary disturbance the surrounding environment.No vehicles are to park or operate within “no-go” areas.Excavators and all other machinery and vehicles must be checked for oil and fuel leaks daily. No machinery or vehicles with leaks are permitted to work on site.No fuel storage, refuelling, vehicle maintenance or vehicle depots to be allowed near natural spring and dam.Refuelling and fuel storage areas, and areas used for the servicing or parking of vehicles and machinery, must be located on impervious bases and must have bunds around them (sized to contain 110 % of the tank capacity) to contain any possible spills. These areas must not be located within any natural drainage areas or preferential flow paths and must be located outside of buffer zones.The contractors used for the project must have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly.	
Assessment	Without mitigation	With mitigation

Nature	Negative		Low negative	
Duration	Short term	Impact will last between 1 and 5 years	Brief	Impact will not last longer than 1 year
Extent	Very limited	Limited to the site and its immediate surroundings	Very limited	Limited to the site and its immediate surroundings
Intensity	Low	Natural and/or social functions and/or processes are somewhat altered	Very low	Natural and/or social functions and/or processes are slightly altered
Probability	Likely	The impact may occur	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Negligible - negative		Negligible - negative	
Comment on significance	Operation of vehicles could result in spillages or leaks of hydrocarbons (fuel and oil) and could lead to unnecessary disturbance of natural areas.			
Cumulative impacts	The impact would result in insignificant cumulative effects.			

Project Phase	Construction			
Activity	Disturbance / removal of topsoil			
Description of impact	Disturbance of topsoil, potential soil erosion and the loss of topsoil			
Mitigable	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	<ul style="list-style-type: none">• Areas that are disturbed through building activities (such as the excavations for pipelines) must be suitably rehabilitated without delay. Failure to do so will have a knock-on effect on biodiversity in the form of an increase in wind erosion, soil exposure and a loss of the soil micro-organisms that are essential for plant growth.• Organic matter, such as roots and humus/topsoil must be removed from the footprint of structures and stockpiled separately for landscaping purposes.• The stockpiling of topsoil for use in rehabilitation is required.• Stockpiles must not exceed 1.5m in height, must be covered with shade cloth or similar, to prevent erosion and any invasive alien species that begin to grow within it must be removed.• Soil disturbance during the removal of alien invasive plants must be minimised as much as possible.• The site must be stabilised where necessary using available materials, where possible. It is recommended that exposed soils are covered with wood chips, and tree branches used to create berms. Any cut alien vegetation on site can be utilised for this purpose if it is without seed.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Low Negative	
Duration	Short term	Impact will last between 1 and 5 years	Brief	Impact will not last longer than 1 year
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site

Intensity	Low	Natural and/or social functions and/or processes are somewhat altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Almost certain	It is most likely that the impact will occur	Likely	The impact may occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Minor - negative		Negligible - negative	
Comment on significance	Clearing areas of the site in preparation for construction will expose bare soil which may lead to the potential loss of topsoil through runoff and incorrect storage. This is not envisaged to be a significant impact with mitigation measures in place. Topsoil can be reused on site for rehabilitation purposes.			
Cumulative impacts	Without mitigation this impact could result in potential erosion downhill of the site caused by stormwater flow.			

Project Phase	Construction			
Activity	Pollution of groundwater			
Description of impact	Spillages of diesel, petrol, oil, paints, clears and other harmful chemicals. These substances may potentially percolate into the groundwater and enter the surrounding environment			
Mitigable	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	<ul style="list-style-type: none">• Install the sewage and wastewater infrastructure according to applicable national SANS standards (SANS1200 Part K:Civil Engineering Standard Specifications, SANS10400:The National Building Regulations and Building Standards Act, SANS 1913:Planning, Design, and Construction of Sanitation Systems), DWS Guidelines and adhere to municipal regulations & by-laws.• Site to be monitored regularly for contaminant spillages and if detected, contact spillage remediation companies.• Separate, tightly cover and monitor toxic substances to prevent spills and possible site contamination.• Cover stockpiles of building materials like cement, sand and other powders.• Regularly inspect stockpiles for spillages and store away from waterways or drainage areas.• Collect any wastewater generated from site activities during construction in settlement tanks then screen, discharge the clean water, and dispose of remaining sludge according to environmental regulations.• Install at least three monitoring piezometers into the water table, one upstream and two downstream of site.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Low Negative	
Duration	Short term	Impact will last between 1 and 5 years	Brief	Impact will not last longer than 1 year
Extent	Local	Extending across the site and to nearby settlements	Limited	Limited to the site and its immediate surroundings
Intensity	Low	Natural and/or social functions and/or processes are somewhat altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Probable	It is most likely that the impact will occur	Probable	It is most likely that the impact will occur

Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Partly reversible	the impact is reversible but more intense mitigation measures are required	Completely reversible	the impact can be reversed with the implementation of minor mitigation measures.
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Minor - negative		Negligible - negative	
Comment on significance	After the implementation of mitigation measures, the significance becomes negligible - negative.			
Cumulative impacts	Since the impact is negligible negative with mitigation, cumulative impacts to groundwater with other projects are not anticipated.			

Project Phase	Construction			
Activity	Noise pollution			
Description of impact	Noise caused by machinery and staff			
Mitigable	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts		
Potential mitigation	<ul style="list-style-type: none">Construction activities must only take place during normal working times between 07:00-17:00 on weekdays.Machinery may be fitted with silences to dampen noise.Staff must be reminded that they are working within a residential area and noise levels must be kept low.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Negative	
Duration	Brief	Impact will not last longer than 1 year	Brief	Impact will not last longer than 1 year
Extent	Limited	Limited to the site and its immediate surroundings	Limited	Limited to the site and its immediate surroundings
Intensity	Very low	Natural and/ or social functions and/ or processes are slightly altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Not relevant		Not relevant	
Significance	Minor - negative		Negligible - negative	
Comment on significance	Some extent of noise pollution during construction is expected; however, with mitigation the impact will be reduced.			
Cumulative impacts	No cumulative impacts exist.			

Project Phase	Construction			
Activity	Visual impact			
Description of impact	Removal of some vegetation will be required for earthworks. Some vegetation would also be cleared for building thereby increasing the visibility of the site and resulting in a loss of the vegetation visual resource. During construction, earthworks would some visual scarring of the landscape.			
Mitigable	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	<ul style="list-style-type: none">• The Architectural Design Guidelines proposed for the development must be adopted to mitigate the colours, heights, disturbance areas, maximum footprint, vegetation, etc, which will all contribute to a smaller visual impact on the landscape.• The necessary measures be implemented during the construction phase to protect the natural vegetation, to control the noise, dust and visual intrusion.• Appoint a Landscape consultant to recommend and implement the introduction of an indigenous landscape plan to protect the existing indigenous vegetation and to prepare a landscape plan for implementation in the private and common areas.• Implement external lighting restrictions and guidelines.• Implement mitigations as per the Visual Impact Assessment (November 2023).			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Negative	
Duration	Short term	Impact will last between 1 and 5 years	Short term	Impact will last between 1 and 5 years
Extent	Local	Extending across the site and to nearby settlements	Local	Extending across the site and to nearby settlements
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Very low	Natural and/or social functions and/or processes are slightly altered
Probability	Probable	It is most likely that the impact will occur	Probable	It is most likely that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Partly reversible	the impact is reversible but more intense mitigation measures are required	Partly reversible	the impact is reversible but more intense mitigation measures are required
Resource irreplaceability	Low	Marginal loss, the resource is not damaged irreparably or is not scarce	Low	Marginal loss, the resource is not damaged irreparably or is not scarce
Significance	Minor - negative		Negligible - negative	
Comment on significance	The significance of impacts is determined through a synthesis of the assessment criteria. The significance of the impacts for the development layout options is low.			
Cumulative impacts	An effect that in itself may not be significant but may become significant if added to other existing or potential impacts that may result from activities associated with the proposed development. The cumulative impacts of the development layout option before mitigation are medium and low after mitigation.			

Project Phase	Construction	
Activity	Employment	
Description of impact	Empowerment of the local community members living in the area relating to temporary employment opportunities	
Mitigable	Medium	Mitigation only exists to ensure that the positive impact is followed through.

Potential mitigation	<ul style="list-style-type: none">• Use existing social structures and communication channels to ensure social representation.• Use local labour and source local materials as far as possible.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Positive	
Duration	Short term	Impact will last between 1 and 5 years	Short term	Impact will last between 1 and 5 years
Extent	Local	Extending across the site and to nearby settlements	Local	Extending across the site and to nearby settlements
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	Not relevant		Not relevant	
Resource irreplaceability	Not relevant		Not relevant	
Significance	Negligible - negative		Negligible - positive	
Comment on significance	Due to the proposed development being on a small-scale, there is a low difference in impacts between without mitigation and with mitigation. However, as the impact would be positive for the local community to be employed during construction, mitigation is recommended to ensure this occurs.			
Cumulative impacts	Minor upliftment for the local community.			

3.3. Impacts foreseen during the Operational Phase

Project Phase	Operational			
Activity	Visual / Sense of place			
Description of impact	The development would result in a small change in visual character from a landscape covered in vegetation and without buildings to a low-density well landscaped built landscape.			
Mitigable	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	<ul style="list-style-type: none">• Municipal by-laws need to be adhered to.• Re-vegetation and Landscaping of open space areas with suitable indigenous vegetation.• Systematic removal and follow-up operations of invasive alien plants.• Adhere to Architectural Design Guidelines and Landscape Plan.• Create a 10m wide buffer between the development and the Keurboom Road. This strip of land will be densely vegetated to obscure the development.• Implement mitigations as per the Visual Impact Assessment (November 2023).			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Negative	
Duration	Short term	Impact will last between 1 and 5 years	Short term	Impact will last between 1 and 5 years

Extent	Local	Extending across the site and to nearby settlements	Local	Extending across the site and to nearby settlements
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Very low	Natural and/or social functions and/or processes are slightly altered
Probability	Probable	It is most likely that the impact will occur	Probable	It is most likely that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Partly reversible	the impact is reversible but more intense mitigation measures are required	Partly reversible	the impact is reversible but more intense mitigation measures are required
Resource irreplaceability	Low	Marginal loss, the resource is not damaged irreparably or is not scarce	Low	Marginal loss, the resource is not damaged irreparably or is not scarce
Significance	Moderate - negative		Minor - negative	
Comment on significance	<p>The significance of impacts is determined through a synthesis of the assessment criteria. The significance of the impacts for the development layout options is low.</p> <p>Lighting, specifically outdoor lighting is not only aesthetic, but it provides a level of security to property owners. Therefore, outdoor lighting is essential, but must be implemented in a way which does not cause negative impacts to neighbours.</p> <p>Ample open spaces and landscaped streets are incorporated into the design to enhance the quality of the neighbourhood.</p>			
Cumulative impacts	An effect that in itself may not be significant but may become significant if added to other existing or potential impacts that may result from activities associated with the proposed development. The cumulative impacts of the development layout option before mitigation are medium and low after mitigation.			

Project Phase	Operational			
Activity	Inputs of stormwater from roofs and roads into the pond			
Description of impact	Reduced physico-chemical water quality including the introduction of litter.			
Mitigable	High	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	<ul style="list-style-type: none">❖ No stormwater infrastructure to be directed towards the pond.❖ Routine maintenance inspections to clear windblow / discarded litter from the pond and spring.❖ Stormwater must be diverted to detention ponds on the site which are indicated on various SDP layouts and are consistent with the SUDS approach to stormwater management.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Low negative	
Duration	Short term	Impact will last between 1 and 2 years.	Brief	Impact will not last longer than 1 year.
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to the site and its immediate surroundings
Intensity	Low	Natural and/or social functions and/or processes are somewhat altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Possible	Has occurred here or elsewhere and could therefore occur	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this

				project although this has rarely been known to result elsewhere
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	Completely reversible	The impact can be reversed with the implementation of minor mitigation measures.	Completely reversible	The impact can be reversed with the implementation of minor mitigation measures.
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Minor - negative		Negligible - negative	
Comment on significance	While a natural spring and pond are present on the site, they are very small in extent and can be adequately protected from the development by implementing the 10m buffer during the construction and operational phases as indicated in this report. The presence of this feature is not sufficient to increase the sensitivity of the site to Very High, and it has been excluded from the development area. No stormwater must be put into this pond as the water is of high quality.			
Cumulative impacts	The impact would result in insignificant cumulative effects.			

Project Phase	Operational			
Activity	Landscaping, gardening and maintenance extending into the pond and buffer area			
Description of impact	Transformation of indigenous vegetation through planting, removal and / or dumping.			
Mitigable	High	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	<ul style="list-style-type: none">❖ Landscaping and gardening staff must not undertake any clearing of vegetation inside of the 10m buffer.❖ A bird hide in the buffer to spot wildlife would be acceptable, but no additional recreational activities. The point is to create a quiet habitat with suitable vegetation cover for continued use by animals, birds etc.❖ Indigenous plants found in adjacent thickets may be planted around the pond. Only indigenous plants found in the immediate surrounding area may be planted.❖ A list of recommended wetland plants for that can be used to improve vegetation cover of muddy areas and marginal areas of the pond is provided in this report.❖ Do not place any fish into the pond as only alien invasive fish to the area would survive and could be transferred to other waterbodies on the feet of animals or birds.❖ The only plants that must be removed from the area are listed alien invasive species.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Low negative	
Duration	Short term	Impact will last between 1 and 2 years.	Brief	Impact will not last longer than 1 year.
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to the site and its immediate surroundings
Intensity	Low	Natural and/or social functions and/or processes are somewhat altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Possible	Has occurred here or elsewhere and could therefore occur	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere

Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	Completely reversible	The impact can be reversed with the implementation of minor mitigation measures.	Completely reversible	The impact can be reversed with the implementation of minor mitigation measures.
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Minor - negative		Negligible - negative	
Comment on significance	The purpose of the pond and spring is to provide a sustained water source for wildlife in the green corridor.			
Cumulative impacts	The impact would result in insignificant cumulative effects.			

Project Phase	Operation			
Activity	Stormwater Management			
Description of impact	Accelerated erosion / pollution into sub-surface water.			
Mitigable	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	<ul style="list-style-type: none">❖ The storm water drainage system must be adhered to, and the system must lead runoff water away from sensitive areas to prevent soil erosion.❖ Use rainwater collection tanks to serve as a retention vessel in downpours.❖ Driveways can be constructed from grass blocks to allow for effective retarding of surface flow and facilitate percolation.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Low Negative	
Duration	Short term	Impact will last between 1 and 5 years	Brief	Impact will not last longer than 1 year
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Low	Natural and/or social functions and/or processes are somewhat altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Almost certain	It is most likely that the impact will occur	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Minor – negative		Negligible - negative	
Comment on significance	The development portion of the site is flat with no gradient along its southern boundary and has no defined drainage discharge points. The existing flat and permeable conditions allow for natural infiltration.			

Cumulative impacts	Without mitigation this impact could result in potential erosion on the site caused by stormwater flow.
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Project Phase	Operation			
Activity	Stormwater Runoff			
Description of impact	Alteration of surface flows caused by increased stormwater runoff.			
Mitigable	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	<ul style="list-style-type: none">❖ Stormwater from erven must be attenuated on site as far as possible.❖ Stormwater from access roads must be attenuated onsite (prior to any discharge into retention ponds).❖ The runoff velocity of stormwater must be reduced with energy dissipaters prior to discharge into retention ponds.❖ Stormwater management must encourage infiltration of water into the soil profile and other on site attenuation (i.e. using grass pavers etc.).❖ The natural spring and small dam must be protected by a 10 m buffer throughout the operational phase.❖ No stormwater must be put into this dam as the water is of high quality.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Low Negative	
Duration	Permanent	Impact may be permanent, or in excess of 20 years	Permanent	Impact may be permanent, or in excess of 20 years
Extent	Very limited	Limited to specific isolated parts of the site	Very limited	Limited to specific isolated parts of the site
Intensity	Medium	Natural and/or social functions and/or processes are notably altered	Low	Natural and/or social functions and/or processes are somewhat altered
Probability	Almost certain	It is most likely that the impact will occur	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Minor - negative		Negligible - negative	
Comment on significance	The development will result in an increase in the area of paved/hardened surfaces. This will generate increased volumes of stormwater runoff. Hardened surface and establishment of foundations for houses may increase sub-surface flows towards the natural spring and small dam. The dam water is of high quality, and pollutants from stormwater runoff entering the dam must be minimised. Adequate management of stormwater must therefore effectively minimise the intensity of this impact.			
Cumulative impacts	Without mitigation this impact could result in the water quality of the dam being compromised.			

Project Phase	Operational			
Activity	Groundwater Contamination			
Description of impact	<ul style="list-style-type: none">Leakage from underground sewage holding tank and associated pipework.Leaks and leachate from the wastewater treatment plant.Improperly treated effluent used for irrigation.WWTP failure.All of the aforementioned impacts could percolate into the groundwater.			
Mitigable	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	<ul style="list-style-type: none">Ensure the WWTP comply with SANS1200 Part K: Civil Engineering Standard Specifications, NWA, Water Quality Guidelines (DWAf), SANS1913: Planning, Design, and Construction of Sanitation Systems, Wastewater Treatment Plant Design and Operational Guidelines (DWAf, 2008).All areas where potential leachate may occur are to be paved and cemented.Regularly service the WWTP and inspect the integrity and efficacy of the WWTP.Ensure emergency procedures are in place to rapidly repair WWTP should failure occur.Set up a comprehensive monitoring system to monitor the effluent quality.Incorporate monitoring network as implemented during the construction phase into operational phase monitoringInstall shallow aquifer piezometers in close proximity to the WWTP to be monitored regularly for any leakages.Should a leak be detected or the monitoring piezometers be contaminated, a baseline Phase 1 Contamination Assessment must be undertaken and the site remediated in consultation with a contamination remediation consultant and the Authorities.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Low Negative	
Duration	Short term	Impact will last between 1 and 5 years	Brief	Impact will not last longer than 1 year
Extent	Local	Extending across the site and to nearby settlements	Limited	Limited to the site and its immediate surroundings
Intensity	Low	Natural and/or social functions and/or processes are somewhat altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Probable	It is most likely that the impact will occur	Probable	It is most likely that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Partly reversible	the impact is reversible but more intense mitigation measures are required	Completely reversible	the impact can be reversed with the implementation of minor mitigation measures.
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Minor - negative		Negligible - negative	
Comment on significance	After the implementation of mitigation measures, the consequence becomes negligible and the significance, negligible - negative.			
Cumulative impacts	Since the impact is negligible negative with mitigation, cumulative impacts to groundwater with other projects are not anticipated.			

Project Phase	Operational			
Activity	Groundwater Recharge and Flooding			
Description of impact	Infrastructure limiting groundwater recharge and/or flooding risk.			
Mitigable	High	Mitigation exists and will considerably reduce the significance of impacts		

Potential mitigation	<ul style="list-style-type: none">• Permeable pavement and green infrastructure (limit coverage of surface area by infrastructure as far as possible.• Rainwater Harvesting• Sustainable Urban Drainage Systems (SUDS)• Retention and Detention Basins• Design stormwater drainage systems to handle increased rainfall events by incorporating overflow pathways, sump pumps, and flow control structures.• Installation of piezometers to track groundwater level.• Inspect and maintain drainage systems, stormwater infrastructure, and mitigation features.• The site levels must be designed such that the floor levels will all be set higher than the level of the Road 394, the existing southern flood containment level.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Low Negative	
Duration	Brief	Impact will not last longer than 1 year	Brief	Impact will not last longer than 1 year
Extent	Limited	Limited to the site and its immediate surroundings	Very Limited	Extending only as far as the development site area
Intensity	Low	Natural and/or social functions and/or processes are somewhat altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Probable	It is most likely that the impact will occur	Probable	It is most likely that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Partly reversible	the impact is reversible but more intense mitigation measures are required	Completely reversible	the impact can be reversed with the implementation of minor mitigation measures.
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Negligible - negative		Negligible - negative	
Comment on significance	After the implementation of mitigation measures, the consequence becomes negligible, and the significance remains as negligible - negative.			
Cumulative impacts	Since the impact is negligible negative with mitigation, cumulative impacts to groundwater with other projects are not anticipated.			

Project Phase	Operation			
Activity	Impacts on ecological drivers			
Description of impact	Effects of the development and activity on the underlying systems and processes that support ecosystems.			
Mitigable	Medium	Mitigation will reduce the significance of impacts		
Potential mitigation	<ul style="list-style-type: none">❖ Access to forested areas during construction must not be permitted by any construction personnel. These areas must be fenced off and no access allowed.❖ Compile and implement an alien management plan, which highlights control priorities and areas and provides a programme for long-term control.❖ Undertake regular monitoring to detect alien invasions early so that they can be controlled, as per the Alien Management Plan.❖ Restrict access to forested areas once the development is complete. An ecological management plan must be compiled and committed to by the future HOA. This should contain measures for protecting the forest from undue traffic and impacts.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Negative	
Duration	Long Term	Impact will last more than 15 years	Long Term	Impact will last more than 15 years

Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to the site and its immediate surroundings
Intensity	Low	Natural and/or social functions and/or processes are somewhat altered	Very low	Natural and/or social functions and/or processes are slightly altered
Probability	Possible	Has occurred here or elsewhere and could therefore occur	Possible	Has occurred here or elsewhere and could therefore occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Irreversible	the impact is irreversible, and no mitigation measures exist	Irreversible	the impact is irreversible, and no mitigation measures exist
Resource irreplaceability	High	Irreparable damage and is not represented elsewhere	High	Irreparable damage and is not represented elsewhere
Significance	Minor - negative		Negligible - negative	
Comment on significance	The most important ecological drivers on site that may be affected by the proposed development are related to maintenance of the forest ecosystem. The forest margins are important for maintaining forest integrity, and the forest canopy needs to be maintained for the health of the forest ecosystem. No development is proposed within the forest, and the secondary forest on the southern margin is also excluded from development.			
Cumulative impacts	The impact would result in insignificant cumulative effects			

Project Phase	Operation			
Activity	Impacts on ecological corridors			
Description of impact	Cut-off of natural dispersal and foraging movement by animals, impacts on suitable link or important corridor, fragmentation of ecological infrastructure			
Mitigable	Low	Mitigation will slightly reduce the significance of impacts		
Potential mitigation	<ul style="list-style-type: none">❖ Fencing should not extend into the corridor on the neighbouring boundaries as the aim is to have an inter-connected corridor that extends across properties, should development occur in adjacent areas.❖ Use clearVu fencing to separate the corridor from the development area. The spring must be incorporated into the corridor. The fence is to keep domestic animals (cats and dogs, etc) out of the wildlife corridor.❖ Fencing should not extend into the corridor on the neighbouring boundaries as the aim is to have an inter-connected corridor that extends across properties, should development occur in adjacent areas.❖ Provide open-space corridors through the development.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Negative	
Duration	Permanent	Impact may be permanent, or in excess of 20 years	Permanent	Impact may be permanent, or in excess of 20 years
Extent	Limited	Limited to the site and its immediate surroundings	Limited	Limited to the site and its immediate surroundings
Intensity	Low	Natural and/or social functions and/or processes are somewhat altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Definite	There are sound scientific reasons to expect that the impact will occur	Definite	There are sound scientific reasons to expect that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	Irreparable damage and is not represented elsewhere	High	Irreparable damage and is not represented elsewhere

Resource irreplaceability	Low	Marginal loss, the resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Minor - negative		Negligible - negative	
Comment on significance	The vegetation type (Garden Route Shale Fynbos) is listed as Endangered. All upland areas of the site on the steep slopes are covered with forest that matches the description for Goukamma /Mesic Dune Thicket (Cowling et al. 2023), which is not threatened, but is separately listed as protected under the National Forests Act. These forested areas are completely excluded from the proposed development (all options) and are not directly affected. The proposed development layout makes provision for a 20m buffer along the forest margin and also incorporated portions of the secondary vegetation area to form part of the open space system within the development, which will link up with the forest area.			
Cumulative impacts	The impact may result in cumulative effects through the landscape.			

Project Phase	Operation			
Activity	Eradication of Alien Vegetation			
Description of impact	Impacts on biodiversity / natural habitats / increased fire risk			
Mitigable	High	Mitigation exists and will considerably reduce significance of impacts		
Potential mitigation	<ul style="list-style-type: none">❖ All invasive alien plants must be completely cleared from the property, and where a tree or bush cover is desired, replaced with suitable indigenous species.❖ Rehabilitation of disturbed areas, as well as previously invaded areas, must promote establishment of site-appropriate indigenous species.❖ A suitable planting list of trees and shrubs must be compiled and incorporated into the Landscape Plan.❖ An Alien Control Plan must be compiled to systematically remove and control alien plant species.❖ Follow-up operations must be done.❖ Minimise disturbance to the natural vegetation using low impact manual labour techniques.❖ Reduce fire hazard on site			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Positive	
Duration	Permanent	Impact may be permanent, or in excess of 20 years	Brief	Impact will not last longer than 1 year
Extent	Limited	Limited to the site and its immediate surroundings	Limited	Limited to the site and its immediate surroundings
Intensity	Very high	Natural and/ or social functions and/ or processes are majorly altered	Medium	Natural and/or social functions and/or processes are notably altered
Probability	Certain / Definite	There are sound scientific reasons to expect that the impact will definitely occur	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	Low	The affected environment will not be able to recover from	Medium	The affected environment will only recover from the impact with significant intervention

		the impact - permanently modified		
Resource irreplaceability	Not relevant		Not relevant	
Significance	Moderate - negative		Moderate - positive	
Comment on significance	An ongoing alien invasive management programme must take place on site. This will protect riparian habitats downslope from degradation and could potentially be the biggest contribution to maintaining and protecting biodiversity on site and in surrounding areas.			
Cumulative impacts	Without mitigation the development would not be meeting design guidelines enforced by the municipality. Specifically design guidelines for the local area.			

Project Phase	Operation			
Activity	Formal gardens			
Description of impact	Habitat loss for terrestrial wildlife, fragmentation of ecological corridor			
Mitigable	Low	Mitigation will slightly reduce the significance of impacts		
Potential mitigation	<ul style="list-style-type: none">❖ Areas that are not required for development purposes must remain natural with indigenous vegetation.❖ All alien invasive plants must be removed from the site on an on-going basis.❖ Investing landowners within the proposed development must be encouraged to avoid planting exotic plants in favour of locally indigenous plants.❖ Landscaping must be done with locally occurring indigenous vegetation.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Positive	
Duration	Brief	Impact will not last longer than 1 year	Permanent	Impact may be permanent, or in excess of 20 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Negligible	Natural and/ or social functions and/ or processes are negligibly altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Highly unlikely / None	Expected never to happen	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	Not relevant	
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Not relevant	
Significance	Negligible - negative		Minor - positive	
Comment on significance	With mitigation the impact is likely to have more beneficial impact to retaining natural biodiversity, than without mitigation.			
Cumulative impacts	Without mitigation this impact could result in the spread of alien invasive plants and the loss of indigenous vegetation.			

Project Phase	Operational			
Activity	Package Plant Maintenance			
Description of impact	Impacts associated with the maintenance of the sewage package plant and potential downtime or failures.			
Mitigable	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	<ul style="list-style-type: none">❖ Assign an Estate maintenance manager responsible for daily inspections of the plant.❖ Ensure the maintenance manager is trained specifically in plant operations and maintenance procedures.❖ Install screening systems to remove non-biodegradable materials and prevent clogging or system damage.❖ Dispose of screened non-biodegradable waste via incineration at a recognized waste disposal site.❖ Install an emergency alarm system that activates if effluent levels rise in the emergency storage component.❖ Design the plant with a 48-hour emergency effluent storage period to accommodate unexpected downtime or failures.❖ Have a contract or arrangement with effluent removal tanker services for extended maintenance events.❖ Conduct monthly testing of effluent to ensure compliance with quality standards.❖ Power the plant using a Solar/Eskom battery system with a backup generator to mitigate Eskom power outages.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Low Negative	
Duration	Brief	Impact will not last longer than 1 year	Brief	Impact will not last longer than 1 year
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Medium	Natural and/or social functions and/or processes are notably altered	Low	Natural and/or social functions and/or processes are slightly altered
Probability	Possible	Has occurred here or elsewhere and could therefore occur	Improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Negligible	No loss of resources	Negligible	No loss of resources
Significance	Moderate - negative		Negligible - negative	
Comment on significance	The implementation of the proposed mitigation measures will significantly reduce the likelihood and severity of operational failures, environmental contamination, and service disruptions associated with the sewage package plant.			
Cumulative impacts	Without mitigation this impact could result in the groundwater quality being compromised.			

3.4. Impacts foreseen during the Decommissioning Phase

Project Phase	Decommissioning			
Activity	Package Plant			
Description of impact	Decommissioning of the package plant resulting in potential pollution of surface and groundwater sources, soil contamination, and health and safety risks.			
Mitigable	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	<ul style="list-style-type: none">❖ Empty and clean tanks before dismantling.❖ Remove all sludge and residue with certified disposal contractors.❖ Conduct soil testing before and after decommissioning.❖ Provide PPE and training for workers.❖ Follow safe dismantling procedures.❖ Prepare and follow a Health and Safety Plan.❖ Ensure seamless transfer of services to municipal sewer connections to prevent public health issues.			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Low Negative	
Duration	Short term	Impact will last between 1 and 2 years	Brief	Impact will not last longer than 1 year
Extent	Local	Extending across the site and to nearby settlements	Very limited	Limited to specific isolated parts of the site
Intensity	Low	Natural and/or social functions and/or processes are slightly altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Possible	Has occurred here or elsewhere and could therefore occur	Improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Negligible	No loss of resources	Negligible	No loss of resources
Significance	Minor - negative		Negligible - negative	
Comment on significance	The decommissioning requirements will only comprise the emptying and removal of the above ground containerized bio reactor plant. Sludge is recycled within the plant system and there will be no sludge accumulation requiring removal on decommissioning.			
Cumulative impacts	Without mitigation this impact could result in the groundwater quality being compromised.			

4. SPECIALIST RECOMMENDATIONS/MANAGEMENT ACTIONS

4.1. Agricultural

Due to the small footprint and low impact on existing agricultural activities, it is the specialist's opinion that the development continues. The development will not have a significant impact on agricultural in the area and poses no threat to food security. In terms of agricultural sensitivity, the development should thus be allowed to proceed.

4.2. Freshwater

Based on the results of the desktop review and the site survey, the sensitivity of aquatic biodiversity on Portion 91/304 can be regarded as LOW. The main factors influencing the statement include the following:

- ❖ The mapped aquatic features at the site are associated with estuarine habitat which is mapped according to the contours (5 m.a.m.s.l.) and not the actual habitat present. Ground-truthing of the site by the aquatic specialist confirmed no estuarine habitat present in remnant vegetation at the site, and no hydromorphic indicators in the soil that would indicate wetland conditions;
- ❖ While a natural spring and dam are present on the site, they are very small in extent and can be adequately protected from the development by implementing the 10m buffer during the construction and operational phases as indicated in this report. The presence of this feature is not sufficient to increase the sensitivity of the site to Very High, and it has been excluded from the development area in both SDP options. No stormwater should be put into this dam as the water is of high quality.
- ❖ According to the Keurbooms-Bitou Estuarine Management Plan the property and proposed development area are located above the 100-year floodline and outside of any ecologically sensitive areas associated with the estuary or Tshokwane wetlands.
- ❖ Following feedback received from DEA&DP querying the level of groundwater at the site, a geotechnical study was compiled. Groundwater was only present in 2 of the test pits at an average depth of 2 m. For wetland or estuarine conditions to form, the soil profile must be periodically saturated in the plant root zone (upper 50 cm). This would need to happen for at least several months of the year to influence vegetation composition. As the groundwater level was substantially deeper than this, and no wetland / estuarine vegetation was observed at the soil surface, it is concluded that no estuarine or wetland habitat could form at the site.

The mapped spring and dam have been protected by a 10 m buffer as recommended, which constitutes the regulated area as per GN509 as this incorporates riparian vegetation in the immediate vicinity of the features. Provided no development takes place within this area, the development will not require any level of Water Use Authorisation in terms of the National Water Act.

4.3. Geohydrology

The following recommendations are made to ensure the protection of groundwater resources to mitigate the potential risks of contamination, recharge and flooding during both the construction and operational phases of the development:

- ❖ **Mitigation Measures:** Implement and strictly adhere to prescribed mitigation measures to minimize environmental impact and ensure compliance with relevant regulations.

- ❖ **Monitoring Network Installation:** It is strongly recommended that the monitoring network be installed prior to the commencement of the proposed development. This will ensure that data is available to monitor groundwater quality and levels from the outset and allow for early detection of any potential issues during the construction phase. This network will also be essential for monitoring during the operational phase to ensure continuous assessment of groundwater quality and levels and to detect any contamination, recharge and flooding risks promptly.
- ❖ **Piezometer Installation:** At least four monitoring piezometers should be installed to effectively detect any potential contaminants and enable monitoring of groundwater quality and levels over time.
- ❖ **Regular Monitoring:** To track changes in groundwater quality, water levels and chemical parameters should be recorded monthly from each of the installed piezometers. Additionally, effluent quality should also be regularly tested to assess the potential impact of the wastewater treatment plant (WWTP).
 - **Laboratory Testing:** All groundwater and effluent samples should be sent to an accredited SANAS laboratory for analysis. Sample collection, handling, and transport should strictly adhere to laboratory standards to ensure the accuracy and integrity of the results.
- ❖ **Rapid Response Plan:** A rapid response plan should be developed in the event that any contamination is detected during the monitoring process. This plan should include clear procedures for identifying the source of contamination, containing the issue, and mitigating any potential environmental impacts. It should also outline specific actions to address contamination quickly and effectively, reducing the risk of groundwater or environmental degradation.

4.4. Plant Species, Animal Species and Terrestrial Biodiversity

Desktop information, field data collection and mapping from aerial imagery provides the following verifications of patterns for various themes:

- ❖ The site consists of a combination of pasture / lawns (on the flat lowlands), secondary scrub vegetation, forest woodland (on the steep south-facing slopes), patches of alien trees, and some scattered milkwood trees within the pasture area. The forests are in a natural state whereas other habitats are secondary.
- ❖ The proposed development will be restricted to the lowland areas that were previously cultivated. The forest areas are therefore outside the proposed development footprint.
- ❖ The forest exists in the areas designated as Critical Biodiversity Area 1. The site occurs within Garden Route Shale Fynbos, which is listed as Endangered. The forest habitat on site is not typical of the listed ecosystem within which it occurs but it is nevertheless a listed ecosystem.
- ❖ Following the procedures within the Species Environmental Assessment Guidelines, the forests on site have been assessed as having Very High sensitivity / Ecological Importance, secondary vegetation as having Medium sensitivity / Ecological Importance, and remaining areas Low or Very Low sensitivity.
- ❖ On the basis of the presence of natural habitat within a CBA1 area and within a listed ecosystem, it is verified that the site occurs partially within an area of VERY HIGH sensitivity with respect to the Terrestrial Biodiversity Theme. These areas are not affected by the proposed development.
- ❖ No plant species of concern were found on the lowland part of the site and, based on the available habitat (except for the forest, which will not be affected by the proposed development), it is considered unlikely that any of those plant species flagged for the site would occur there. However, it is likely that an Endangered tree species occurs within the forest, and possible that a Rare tree occurs within the forest. It is therefore verified that the site has MEDIUM sensitivity with respect to the Plant Species Theme, but only within areas not affected by the proposed development.

- ❖ The lowland part of the site is not considered to be good habitat for any of the animal species flagged for the site. However, the forest is likely habitat for three animal species, the Knysna Warbler (Vulnerable), a small antelope (Vulnerable), and the Tunnelling Dung Beetle (Endangered). It is therefore verified that the Animal Species Theme has MEDIUM sensitivity for the site, but only within areas not affected by the proposed development.
- ❖ An impact assessment determined that the impact of the proposed development (both options) has Very Low significance on vegetation, protected trees, and animal species of concern. However, Alternative 1 is preferred on the basis that it incorporates more open space, which is better for ecosystem processes and connectivity, although not significantly so.
- ❖ The proposed development project (73 units) affects a small area mapped in the Keurbooms and Environs Local Area Spatial Plan (KELASP) as "*Map Unit 8: Fynbos invaded with aliens*", which is a restricted zone according to this LASP. The on-site vegetation was found to be secondary with alien plants, but this is legally natural vegetation within an Endangered ecosystem (according to the legal definition of natural vegetation in NEMA). This small patch of habitat is not considered to have biodiversity significance, but constitutes the only restriction, according to the information considered here. On this basis, the Alternative 1 proposal is preferred.
- ❖ The proposed development is entirely within areas mapped as secondary or pasture that has low biodiversity value and sensitivity. The development is therefore supported on condition that forest habitats on the property are fully protected. Either option is acceptable, although Alternative 1 is marginally preferred.

The following recommendations have been made based on the specialist's findings:

- ❖ Forest habitats on the upland, steeply-sloping part of the site, have high biodiversity and conservation value, and are designated as sensitive. These areas must not be affected by the proposed development. A buffer zone must be retained along the base of the slope to protect the forest margin. For example, steps must be taken to rehabilitate these areas and encourage growth of species, such as *Pterocelastrus tricuspidatus* and *Sideroxylon inerme*, that are mesic and fire-resistant. An open space management system must be developed to formalize such steps for forest protection.
- ❖ Rehabilitation of disturbed areas, as well as previously invaded areas, should promote establishment of site-appropriate indigenous species.
- ❖ An ongoing alien invasive management programme must take place on site. This will protect riparian habitats downslope from degradation and could potentially be the biggest contribution to maintaining and protecting biodiversity on site and in surrounding areas.
- ❖ The bulb species, *Brunsvigia orientalis*, was found on site within the proposed development footprint. Although not threatened, it is recommended that all individuals are rescued prior to commencement of development. Locations of individuals must be determined by a qualified botanist during the flowering period in late summer (around March) and plants rescued at an appropriate time thereafter. Plant rescue and relocation must follow the requirements of the Bitou Municipality.

4.5. Visual Impact Assessment

4.5.1. Reducing unnecessary disturbance

As a general rule, reducing the amount of land disturbed during the construction of a project reduces the extent of visual impact. Measures relevant to the project include:

- Retain as much of the existing vegetation as possible and where practical screen construction activities from key viewing locations. This is also referred to as vegetation manipulation.
- Establish limits of disturbance that reflect the minimum area required for construction.
- Existing vegetation must be retained where possible through the use of retaining walls.

4.5.2. Colour selection

The selection of the best colour for the planned project will have the greatest impact on the visual success or failure of the project. Strong contrasts in colour create easily recognizable visual conflicts in the landscape. Measures relevant to the project include:

- The selection of colours that blend with or are in harmony with the surrounding landscape will drastically reduce the visual impact of the project
- Galvanized steel on structures should be darkened to prevent glare. Low-lustre paints should be used wherever possible to reduce glare.

4.5.3. Reduce contrasts from earthworks

The scars left by excessive cut and fill activities during construction often leave long-lasting negative visual impacts. Once the dark surface soil layer is disturbed, exposing the much lighter colour of the subsurface soil, a strong contrast is created that may take many years to recover.

There are several ways to reduce the contrasts created by earthwork construction. Proper location and alignment are the most important factors. Fitting the proposed project infrastructure to the existing landforms in a manner that minimizes the size of cuts and fills will greatly reduce visual impacts from earthwork. Other earthwork design techniques, such as balancing cut and fill or constructing with all fill or all cut should be considered, where appropriate, as methods to reduce strong visual impacts. Measures relevant to the project include:

- The scars left by excessive cut and fill activities during construction often leave long-lasting negative visual impacts. Where possible fitting the proposed project infrastructure to the existing landforms in a manner that minimizes the size of cuts and fills will greatly reduce visual impacts from earthwork.
- The dumping of excess rock and earth on downhill slopes must be limited.

4.5.4. Glint and Glare

Solar glint and glare i.e. reflected sunlight from shiny surfaces such as windows can affect safety and residential amenity in surrounding areas. Glint is a momentary flash of light, and may be produced as a direct reflection of the sun on a window. Glint effects are not restricted to just windows and can occur from any reflective surface including building facades.

Glare is a continuous source of excessive brightness. It could be experienced by a stationary observer located in the path of reflected sunlight from the face of a window. Glare can also be an issue for buildings with reflective/ glassy facades.

Glint and glare can cause a distraction or lead to an after-image being experienced by an observer. This can present a nuisance and, under some circumstances, a safety hazard. Solar glint and glare impact significance is categorised differently for varying observer types. For dwelling receptors, significance is predominantly defined by duration and separation distance. For road users, it is mostly down to the location of the glare relative to an observer's field of view.

Low emissivity windows (Low-E) are designed to reflect much more solar energy than standard glass panes. They block as much as 99% of the sun's ultraviolet rays, preventing interiors from fading and reducing the health risks posed by ultraviolet light. Low-E windows also block a large percentage of the sun's infrared light, which is chiefly responsible for solar heat gain inside a property; it is primarily for this reason that these windows are known as energy efficient. Most low-E windows are also quite well-insulated thanks to a double pane design, which further enhances their energy efficiency.

But all that UV and IR light reflected off Low-E windows has to go somewhere, and quite often it does so in the form of light beams (glare) intense enough to melt some materials or to pose a hazard to nearby humans and animals.

Anti-glare window film can be applied to windows prone to glare. They reduce the reflection without reducing the amount of light that reaches the room and without obstructing the view either. The roof of a building can also be extended to provide more shade and thereby reducing glare from windows.

4.5.5. Limiting the footprints and heights of structures

Visual impact can be reduced by limiting the footprint of the buildings and hardscaping as well as the heights of buildings. Limiting the footprint of infrastructure will help to provide more greening areas in between buildings which will assist with screening and visual absorption of structures

4.5.6. Development and architectural guidelines

Development and building guidelines need to address procedural, planning and aesthetic considerations required for the successful design and development of the property and the architectural ethos of the development. The purpose of design guidelines is to protect and safeguard the environment and scenic resources and guide the appropriate architectural character to protect the investment value of the development. The guidelines should not be restrictive conditions but must promote an overall design sensitivity whilst allowing flexibility for individual expression.

4.5.7. Landscaping

A Landscape Plan must be drawn up by a professionally registered Landscape Architect. The objective of the Landscape Plan must be:

- To identify and retain indigenous trees and shrubs that will visually screen the development.
- To provide a planting plan of indigenous trees and shrubs for streets and open spaces that will allow for the medium – long-term visual screening of the development and enhance the living environment of the owners and residents.
- To draw up a management plan for phasing in indigenous trees and phasing out exotic trees such that the proposed development will always be screened from sensitive receptors, by trees. The plan must include the planting of fast-growing, pioneer-type trees, trees with a medium growth rate and those that have a slower growth rate. This management plan must be for a minimum of 20 years and must be monitored and revised every 5 years.
- To provide Landscape Guidelines for homeowners. Planting of lawn alone exacerbates the visibility of the units. The mix of lawn, shrubs and trees must be carefully designed with the importance of trees and large shrubs emphasized, to provide further greening of the built environment.
- To draw up a Landscape Operational Maintenance Plan for the Homeowners Association or owner to manage the shared open spaces beyond individual erf boundaries.
- To provide guidelines on visually permeable boundary treatments, using fencing for the most part and walls at entrances only. No precast concrete walls.

4.5.8. Lighting design

Effective light management needs to be incorporated into the design of the lighting to ensure that the visual influence is limited to the power station, without jeopardising operational safety and security.

Several measures can be implemented to reduce light pollution and those relevant to the project are as follows:

- Where possible construction activities must be conducted behind noise/light barriers that could include vegetation screens.
- Low flux lamps and the direction of fixed lights toward the ground must be implemented where practical. Choose “full-cut off shielded” fixtures that keep light from going uselessly up or sideways. Full cut-off light fixtures produce minimum glare. They increase safety because you see illuminated people, cars, and terrain, not dazzling bulbs. If you can see the bright bulb from a distance, it's a bad light. With a good light, you see lit ground instead of the dazzling bulb. “Glare” is light that beams directly from a bulb into your eye.
- The design of night lighting must be kept to a minimum level required for operations and safety

- The utilisation of specific frequency LED lighting with a green hue on perimeter security fencing.
- Where feasible, put lights on timers to turn them off each night after they are no longer needed

4.5.9. Restoration and reclamation

Strategies for restoration and reclamation are very similar to the design strategies for earthwork, as well as the design fundamentals of repeating form, line, colour, and texture and reducing unnecessary disturbance. The objectives of restoration and reclamation include reducing long-term visual impacts by decreasing the amount of disturbed area and blending the disturbed area into the natural environment while still providing for project operations.

Though restoration and reclamation are separate parts of project design, they must not be forgotten or ignored. It is always a good idea to require a restoration/reclamation plan as part of the original design package. All areas of disturbance that are not needed for operation and maintenance must be restored as closely as possible to previous conditions. Measures relevant to the project include:

- The objective of restoration and reclamation efforts is to reduce the long-term visual impacts by decreasing the amount of disturbed area and blending the disturbed area into the natural environment while still providing for project operations.
- Topsoil must be stripped, saved, and replaced on earth surfaces disturbed by construction activities.
- Planting holes must be established on cut/fill slopes to retain water and seeds.
- Indigenous plant species must be selected to rehabilitate disturbed areas.
- Where possible rehabilitation efforts must emulate surrounding landscape patterns in terms of colour, texture and vegetation continuums.
- Replacing soil, brush, rocks and forest debris over disturbed earth surfaces when appropriate, thus allowing for natural regeneration rather than introducing an unnatural-looking grass cover.
- Revegetation of disturbed areas must occur as soon as practicable possible after the completion of various construction activities.

4.5.10. Monitoring program

The potential visual impacts and proposed mitigation thereof must be undertaken by a professionally registered landscape architect that must be part of the design team (including engineers and architects). The brief of the landscape architect (LA) must include:

- The LA must consult with both engineers and architects to ensure that sensitive earthwork and building design development occurs, which will allow for reducing the construction and operation phase visual impacts.
- The LA must work with the project surveyor, arborist and planners in establishing which trees are to remain on site for visual screening and taking this information into the design development of the civil and building works.
- The LA must prepare a landscape plan, design development thereof and monitoring implementation and thereafter maintenance. The plan must include the tree survey and what trees are, what indigenous vegetation is, to be retained, what is to be removed, the planting of indigenous trees, new trees and shrub planting along roadways and in open spaces in the built areas and a guideline document for private gardens within the development.

4.6. Geotechnical

The geotechnical investigations have indicated that the site was potentially suitable for the proposed development but there were some moderate geotechnical constraints which required consideration in the structural design. Some preliminary recommendations were provided but all geotechnical information should be verified during construction.

The following recommendations are based on limited information gained from the site investigation and although the confidence in the information is high, significant variation is likely to occur between information points. All geotechnical information should be verified during construction and any significant variations should be brought to the attention of the geotechnical engineer for comment or further recommendations. It is recommended that the structural & civil engineers discuss their designs with the geotechnical engineer to ensure that the designs are compatible with the expected geotechnical conditions. Regular supervision by the structural engineer was highly recommended to ensure suitable founding conditions.

4.6.1. Earthworks and structural foundations

Earthworks should be designed and constructed in accordance with SABS 1200D and/or any site-specific specifications provided by the civil engineer. Foundations should be designed and constructed in accordance with SANS 10400-H or as specified by the structural engineer.

To clear and prepare site for earthworks and construction, it was recommended that at least 150mm of topsoil and vegetation cover be removed from the footprint area. Large roots be grubbed and platform levels established by cutting and/or filling with insitu soil obtained from site. Bulk fill should be compacted to minimum 93%MDD. Low retaining walls may be required in some areas, depending on site levels. The insitu sandy soils were generally suitable for use as general fill on platforms, in roadbeds and as trench backfill. Any organic matter or unsuitable soil should be removed from potential fill material.

Unsuitable ground conditions exposed during earthworks should be referred to the engineer for further investigation and consideration on appropriate action.

Foundation system for the proposed single/double storey residential structures:

- a. RC strips/bases – clear and level site to PL, excavate trenches to PL-1m, wet and compact base of trench with 6 passes of mechanical rammer, such that DCP penetrates at less than 30mm/blow to a depth of 1m below the base of the excavation, backfill the trench to PL-0.7m (recommended final founding level) in layers with compacted sand ex-insitu to 100%MDD or <20mm/blow of DCP. Limit bearing pressures to max 150kPa. Alternatively, excavate trenches to PL-0.7m, compact base of trench such that DCP penetrates at less than 30mm/blow and limit bearing pressures to 100kPa.
- b. Raft foundations on a compacted insitu platform – excavate ~0.6m of insitu soils below entire platform area, compact base of excavation with roller, replace compacted soil in layers back up to platform level such that DCP penetrates at <30mm/blow, construct light raft foundation with max bearing pressures of 75kPa.

Additional measures can be considered for heavier structures.

4.6.2. Site drainage

The design and construction of storm water drainage should be carried out in accordance with SABS 1200LE, COLTO, The Red Book or other applicable standards, as determined by the civil engineer.

Consideration should be paid to stormwater drainage due to the low gradient on the site and the likelihood of stormwater accumulating on surface after heavy downpours. Stormwater from roofs can generally be handled in gutters, downpipes and open channels or underground pipes, with suitable discharge locations on the southern side of the site. A well designed road layout can assist in management of stormwater run-off from site, with minor flood events being accommodated within the road prism with raised barrier kerbs and/or side channels.

Allowances should be made for stormwater handling from slopes above the site (including continual seepage at/near spring area).

4.6.3. Roads

It is recommended that road layerworks, including G4-G6 subbase and G1-G4 base layers (for asphalt-sealed roads) be imported from local commercial quarries. The insitu sandy soil can be used for roadbed and SSG layerworks in lightly trafficked internal estate roads.

4.7. Stormwater Management

The stormwater will be managed such that roof areas will drain to gardens which will fall towards roads or directly to one of three infiltration attenuation ponds P1, P2 and P3 to be provided. The main access roads will be surfaced with permeable paving and secondary roads with grass block paving. In either case infiltration will occur through the road structure and roadbed to the natural ground below. Excess runoff to the road surfaces which does not infiltrate will be surface discharged to the infiltration ponds.

Based on an average roof area of 225m² the overall impermeable roof area will be approximately 25 percent of the road reserve and landscaped areas. This impermeable proportion does not increase the total discharge volume of the site, but does reduce the available infiltration area, and therefore increases the required duration of infiltration. Containment of the excess discharge within the ponds, will allow for the longer discharge infiltration time.

Site levels will be designed to ensure the effective implementation of the stormwater management system. The minimum floor level of any stand will be 4.0m MSL. The site slopes and road levels will be designed to flat gradients to enable maximum infiltration whilst draining on surface to the ponds. The levels will also be designed to contain flood runoff within the ponds. The preliminary estimated pond invert levels are such that they will be a minimum of 1.5m above the existing watertable. The site design levels will protect homes from flooding and will also detain excess site runoff from flooding over the Keurboomstrand Road.

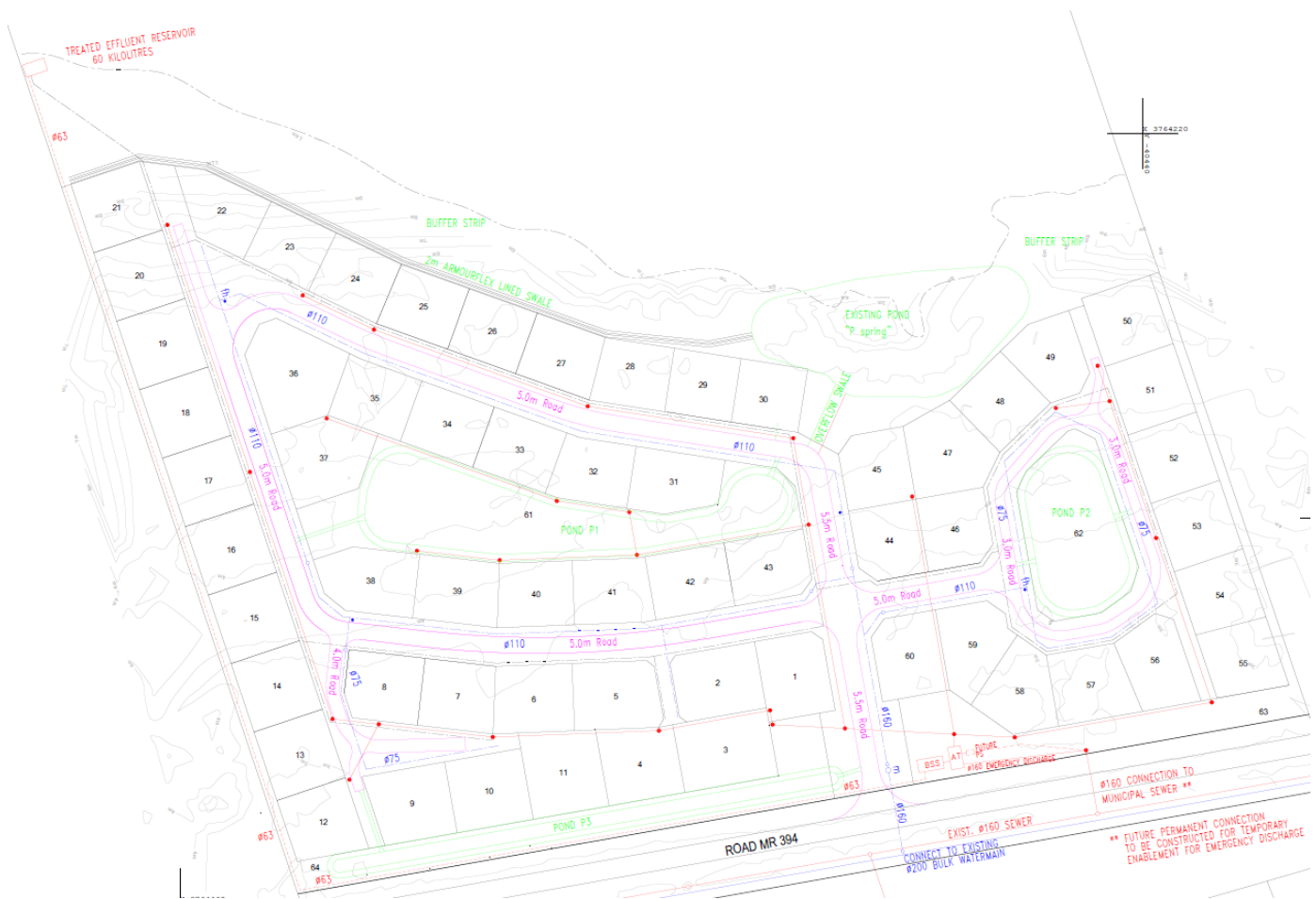


Figure 1: General Layout for roads, stormwater, sewer and water reticulation (Poise Consulting Engineer).

4.8. Fire Management

One could argue that the landowner does have an obligation to protect the people/residence inside his/her property/development therefore he/she could be held accountable for damages to infrastructure/houses inside his/her property should a wildfire spread onto the development from neighbouring property and there were no boundary firebreaks in place. This goes beyond boundary firebreaks. Then defensible spaces must/should be created around the structures. Removing vegetation around structures within a property is regulated by other environmental legislation. The NVFFA only focuses on reducing/limiting the spread of wildfires/vegetation fires from one property/owner to another/neighbouring property/landowner therefore the system of boundary firebreaks.

By nature, veldfires do not respect property or boundaries. Without preventive measures, veldfires will continue to burn for as long as the weather is favourable and there is vegetation to burn. Anyone owning land has the first responsibility to control fires on his or her own land. But when fires burn in severe conditions they quickly extend beyond any one property, and become a problem that cannot be handled by individuals, but can only be controlled by joint, co-ordinated efforts. Veldfires are a matter of common concern. For this reason, in South Africa as in other countries, effective policies and plans for preventing and combating veldfires must be clear about individual responsibility as well and co-operative and co-ordinated roles and responsibilities. The landowner will become a member of the Southern Cape Fire Protection Association (SCFPA). The SCFPA will engage with the landowner and will provide advice to cover the other aspects related to compliance to the NVFFA (equipment needed and actions to be taken when there is a vegetation fire on the property).

Recommendations:

- Implementing regulations/rules around “braai” fires /open flame fires that should be considered especially when high fire danger weather conditions are predicted.
- ensuring that access roads are kept clear for firefighting vehicles to have unobstructed access to the structures/houses.
- work collaboratively with local authorities - develop an emergency preparedness plan that outlines the steps to take in the event of a fire. The plan should include protocols for notification, evacuation, and communication with local authorities.
- overall, the goal of the fire management plan should be to prevent wildfires from starting and spreading within the development and to minimize the impact of any fires that do occur.

4.9. Maintenance of the Bio Sewage System Plant

Plant care will be included in the job responsibility of the Estate maintenance manager, who will be trained accordingly and will visit site and inspect the plant on a daily basis.

Pre-treatment screening will be provided which will facilitate the cleaning and removal of non biodegradables. The frequency of cleaning will be determined once the plant is in operation and the amount of non-biodegradables being screened. The non-biodegradables removed would be sent for incineration at a recognised waste disposal site.

To enable the monitoring of any potential failure and consequential overflow of the system, an emergency alarm will be installed which will be activated once effluent level rises in the emergency storage component of the system.

All required regular maintenance can be done within the 48 hour emergency storage period. In the event of any abnormal extended maintenance period arising, effluent removal tanker services will be engaged.

Effluent quality will be tested on a monthly basis.

The plant will be powered by a Solar/Eskom charged battery system with a backup generator for emergency supply in the event of extended Eskom down time.

4.10. Decommissioning of the Bio Sewage System Plant¹

The Bio Sewage Systems plant comprises an underground anaerobic tank and an above ground containerized bio reactor plant. Sludge is recycled within the plant system and there will be no sludge accumulation requiring removal on decommissioning.

On decommissioning of the Plant a sewerage pump station will be required which will pump the effluent to the municipal system. The Plant underground anaerobic tank will serve as the future pump station sump and will be designed in the initial stage to accommodate the later conversion.

The decommissioning requirements will therefore only comprise the emptying and removal of the above ground containerized bio reactor plant.

The decommissioning process will therefore be as follows:

¹ Information provided by Poise Consulting Engineers, May 2025.

- Construct the future pump station outlet valve chamber adjacent to the existing anaerobic tank, including installation of outlet valve manifold.
- Construct the rising main from the outlet valve chamber to the site gravity municipal connection.
- Install the permanent pumps in the anaerobic tank/future pump sump, connect to the outlet chamber manifold and commission the pump station.
- Close the Bio Sewage Plant anaerobic tank extraction valve and empty the contents of the containerized plant into the pump sump.
- Clean and disinfect the containerized plant by pumping chlorinated water through the plant.
- Remove the containerized above ground component to new usage or approved disposal site.

5. LEGISLATIVE REQUIREMENTS

5.1 Signing of the EMPr

The acknowledgement form at the back of the approved EMPr is to be signed by the holder of the Environmental Authorisation (the Applicant), the Site Manager and the ECO; acknowledging that all parties are familiar with the requirements of the EMPr. All employees, especially the machine and equipment operators, are to be made aware of the conditions as contained in the EMPr as well as the contractual conditions relating to the environment as contained in the contract document.

5.2. Legislation

Of importance are all national, provincial and municipal by-laws and regulations. Statutes are amended periodically and it is the Applicant's responsibility to identify legislation relevant to the proposed activity.

Title of legislation, policy or guideline:	Administering authority:	Date:
Constitution of the Republic of South Africa. (Act 108 of 1996)	All State and Provincial Departments as well as Local Authorities that have been identified as relevant Competent Authorities.	Relevant Consideration
Environmental Conservation Act (Act 73 of 1989)	Department of Economic Development, Environmental Affairs & Tourism	Relevant Consideration
National Environmental Management Act (Act 107 of 1998)	Department of Economic Development, Environmental Affairs & Tourism	Authorization – December 2022/January 2023
National Environmental Management: Biodiversity Act (Act 10 of 2004)	Department of Economic Development, Environmental Affairs & Tourism	Relevant Consideration
National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008)	Department of Forestry, Fisheries, and the Environment (DFFE), Branch Oceans & Coasts (O&C)/ Department of Economic	Comment/ Relevant Consideration

	Development, Environmental Affairs & Tourism	
National Environmental Management: Protected Areas Act (Act 57 of 2003)	Department of Economic Development, Environmental Affairs & Tourism	Relevant Consideration
National Water Act (Act 36 of 1998)	Department of Water and Sanitation	Relevant Consideration
Water Services Act (Act 108 of 1997)	Department of Water and Sanitation	Relevant Consideration
Sea Shore Act (Act 21 Of 1935)	Department of Forestry, Fisheries, and the Environment (DFFE), Branch Oceans & Coasts (O&C)/ Department of Economic Development, Environmental Affairs & Tourism	Relevant Consideration
Conservation Of Agricultural Resources Act (Act 43 of 1983)	Department of Agriculture, Forestry and Fisheries	Relevant Consideration
National Heritage Resources Act (Act 25 of 1999)	Eastern Cape Provincial Heritage Resources Authority	Comment/ Relevant Consideration

5.3. Project Responsibilities

Responsibility for the implementation of the EMPr lies with the Applicant who must retain the services of a suitably experienced Environmental Control Officer (ECO) who will monitor the construction processes and activities periodically.

5.3.1. The Applicant / Holder of the EA

The holder of the EA / property owner is the overseeing entity responsible for ensuring that all activities undertaken on the property comply with the Environmental Authorisation (EA) and associated Environmental Management Programme (EMPr) (& any other approval / licence / permit).

Actions relate (but are not limited to) –

- Ensure that that all tender documentation include reference to, and the need for compliance with, the EA and EMPr as well as any other legally binding documentation.
- Ensure that all employed Contractors and Engineers are aware of and understand the conditions of the EMPr (Include the EMPr in all tender documents)
- The right to remove any person or appointed contractors or personnel from site if the contravene with the EMPr.
- Appoint an Environmental Control Officer.
- The project Applicant (holder of the Environmental Authorisation of the EMPr) must notify the competent authority of the commencement of maintenance management activities 14 days prior to such commencement taking place.

5.3.2. The ECO

- Secure the protection and provide assistance on the rehabilitation of the environment.
- Guide, advise and consult the relevant authority on environmental issues during construction.
- Guide, advise and consult any sub-contractors, suppliers etc. who will be involved in this project.
- Revise the EMPr as required and inform the relevant parties of the changes.

- Ensure that the EMPr has been accepted and understood as a contractually binding document on all parties involved with this project.
- Ensure staff operating equipment are adequately trained, certified and sensitised to any potential hazards associated with their tasks.
- Educate staff as to the need to refrain from indiscriminate waste disposal and/or pollution of local soil and water resources, ensure that they (the staff) have received the necessary safety training, and are aware of the importance of a “clean-site policy”.
- The management guidelines contained in this document must form part of the contractual agreements between the Applicant, Contractor and the ECO.

Site Visit Frequency:

- The ECO must conduct site inspections every two weeks during the construction phase (the frequency may be increased to weekly site inspections) and submit the ECO monitoring reports monthly.
- The ECO must conduct site inspections once a month during the rehabilitation phase and submit the ECO monitoring reports during this phase monthly.

Environmental induction and training

- It will be the responsibility of the ECO to provide adequate environmental awareness training of senior site personnel takes place and that all construction workers receive an induction presentation on the importance and implications of the EA and EMPr.
- Where staff turnover is high and with additional appointment of Sub-contractors, it may be necessary to undertake additional induction training sessions. The Contractor must keep records of all environmental training sessions, including names, dates and the information presented.

5.3.3. The Engineers and Contractors

The responsibilities indicated here are also relevant to Sub-Contractors. The responsibilities of the Engineers and Contractors include but are not limited to the following:

- Adhere with the conditions and recommendations of the EMPr or any other legally binding documentation.
- Prevent actions that may cause harm to the environment.
- Be responsible for any remedial activities in response to an environmental incident within their scope of influence.
- Ensure compliance of all site personnel and / or visitors to the EMPR and any other authorisations.

All fines for noncompliance of EMPr to be predetermined by Site Manager, ECO and Project Applicant, this needs to be included in method statement. Breach of the Construction Phase Management Rules can be consulted in this regard.

6. REPORTING PROCEDURES

6.1. Documentation

The following documentation must be kept on site in order to record compliance with the EMPr:

An Environmental File which includes:

- Copy of the EMPr;
- Copy of the EA;
- Copy of all other licences/permits;
- Environmental Method Statements;
- Non-conformance Reports;
- Environmental register, which shall include:
 - Communications Register – including records of complaints, minutes and attendance registers of all environmental meetings;
 - Monitoring Results – including environmental monitoring reports, register of audits, non-conformance reports; and
 - Incident book – including copies of notification of Emergencies and Incidents, this must be accompanied by a photographic record.
- Waste Documentation such as, but not necessarily limited to: Waste Manifest Documents;
- Material Safety Data Sheets (MSDSs) for any hazardous substances; and
- Written Corrective Action Instructions.

6.2. Environmental Register

The Applicant will put in place an Environmental Register and will ensure that the following information is recorded for all complaints / incidents:

- Nature of complaint / incident.
- Causes of complaint / incident.
- Party/parties responsible for causing complaint / incident.
- Immediate actions undertaken to stop / reduce / contain the causes of the complaint / incident.
- Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint / incident.
- Timeframes and the parties responsible for the implementation of the corrective or remedial actions.
- Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented.
- Copies of all correspondence received regarding complaints/incidents.

6.3. Non-Conformance Report

A Non-Conformance Report (NCR) will be issued to the Applicant as a final step towards rectifying a failure in complying with a requirement of the EMPr. This will be issued by the ECO to the Applicant in writing. Preceding the issuing of a NCR, the Applicant must be given an opportunity to rectify the issue.

Should the ECO assess an incident or issue and find it to be significant (e.g. non-repairable damage to the environment), it will be reported to the relevant authorities and immediately escalated to the level of a NCR. The following information should be recorded in the NCR:

- Details of non-conformance;
- Any plant or equipment involved;
- Any chemicals or hazardous substances involved;
- Work procedures not followed;
- Any other physical aspects;
- Nature of the risk;
- Actions agreed to by all parties following consultation to adequately address the non-conformance in terms of specific control measures and should take the hierarchy of controls into account;
- Agreed timeframe by which the actions documented in the NCR must be carried out; and
- ECO should verify that the agreed actions have taken place by the agreed completion date, when completed satisfactorily; the ECO and Applicant should sign the Close-Out portion of the Non-Conformance Form and file it with the contract documentation.

6.4. Emergency Response

The Applicants environmental emergency procedures must ensure appropriate responses to unexpected / accidental actions / incidents that could cause environmental impacts.

The Environmental Emergency Response Plan is separate to the Health and Safety Plan as it is aimed at responding specifically to environmental incidents and must ensure and include the following:

- Employees shall be adequately trained in terms of incidents and emergency situations;
- Details of the organisation (i.e. manpower) and responsibilities, accountability and liability of personnel;
- A list of key personnel and contact numbers;
- Details of emergency services (e.g. the fire department / on-site fire detail, spill clean-up services) shall be listed;
- Internal and external communication plans, including prescribed reporting procedures;
- Actions to be taken in the event of different types of emergencies;
- Incident recording, progress reporting and remediation measures to be implemented; and
- Information on any hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release.

7. COMPLIANCE WITH THE EMPr

7.1 Monitoring and Compliance

The monitoring and compliance of the development must take place as follows:

- The ECO has the authority to instruct the Applicant to cease a particular operation causing or liable to cause significant environmental damage, and issue fines or penalties for non-compliance of the Environmental Management Programme/ EMPr.
- An Environmental Control Officer (ECO) must monitor the site and compile a monitor report on the frequency that was determined.

- The holder of the environmental authorisation (the Applicant) is responsible to ensure that an environmental audit report is submitted to the Competent Authority as per the timeframes stipulated in the Environmental Authorisation (EA).

7.2 Auditing Process

- An independent EAP must be appointed to conduct an audit of the project. As per the EA, such person may not be the ECO or EAP who conducted the EIA process.
- Auditing during non-operational phase (construction phase):
 - During the period which the development activities have been commenced with on the site, the Holder must ensure annual environmental audit(s) are undertaken and the Environmental Audit Report(s) submitted annually to the Competent Authority.
 - Final Environmental Audit Report for the construction phase (non-operational component) must be submitted to the Competent Authority within three (3) months of completion of the construction phase.
- The audit is to report on the success of the implementation of the EA and the EMPr as the case may be.
- Auditing requirements are to cover ONLY the construction and rehabilitation phase and do not extend to the operational phase.

7.3 Non-Compliance

Definition

The non-compliance is defined as, and will be issued for:

- Any deviation by the Applicant from the environmental conditions and requirements as set out in the EA and EMPr, or;
- Any contravention by the Applicant of environmental legislation, or;
- Any unforeseen environmental impact resulting from direct or indirect actions or activities on site that would be considered as a significant impact. Significance will be determined by the Environmental Control Officer (ECO) but will be informed by geographic extent, duration, lasting effects of the impact and extent of remediation to the impact.

Types of non-compliances issued

Two types of non-compliances may be issued:

A. Stop Works Non-Compliance

Stop Works Non-Compliance will require that all works as described in the non-compliance will stop immediately and may only continue on a formal written permission from the ECO.

Stop Works Non-Compliance will be issued under the following conditions:

- Total disregard by the Applicant to the environmental conditions and requirements listed in the EA and EMPr;
- An activity that if left unattended will escalate the degree, severity or extent of the environmental impact.

B. General Non-Compliance

A general non-compliance will allow work and activity by the receiving party to continue while the corrective action takes place.

7.4 Process of Issuing Non-Compliance

The appointed Environmental Control Officer (ECO) may issue a formal non-compliance to the Applicant. A copy of the non-compliance issued will be placed in the EMPr file. The Applicant will be responsible for returning a formally signed off corrective action (as per template) to the ECO to be placed in the EMPr file. The ECO will be required to sign-off on the corrective action, indicating that it has been completed within the timeframes and to the satisfaction of the ECO.

In the event of damage being caused, the contractor will be responsible for the cost of cleanup, repair and / or rehabilitation as necessary, as well as being liable for the fine. These fines will not be determined by the ECO, rather the ECO will report continued non-compliance to the competent authority which will determine the amount of the fine.

Non-compliance may be issued to:

- The Applicant
- Any representative of the Applicant

7.5 Failure to complete corrective actions

In the event that the Applicant fails or refuses to complete the corrective action, either at all or within the allocated timeframe, the ECO shall inform DEA&DP in writing that a condition of approval for the project is not being met.

The DEA&DP office is responsible for resolving the impasse with the Applicant.

The Applicant is deemed not to have complied with the EA and EMPr if:

- Within the boundaries of the site and site extensions there is evidence of contravention of clauses;
- Environmental damage occurs due to negligence; inappropriate actions taken by the Applicant or any of his staff.

On receiving a notice of non-compliance the Applicant is required to swiftly address the issue/s taking all corrective actions required to rectify the situation. Penalties will be applied for non-compliant situations. Penalties/fines are advocated to ensure corrective measures are successfully undertaken and the necessary standard of rehabilitation is achieved.

The penalty associated with a chemical spill is not a set amount but will depend on the nature and extent of the spill; the cost of any soil and /or groundwater monitoring and any soil and /or groundwater remediation required by authorities will be to the Applicant's account.

The imposition of such a penalties / fines shall not preclude the relevant competent authority from applying an additional penalty in accordance with statutory powers.

Failure to redress the cause shall be reported to the relevant authority for them to deal with the transgression as deemed fit.

7.7 Unlawful Activity/ies

NEMA and its Regulations entitle environmental authorities to administer a fine not exceeding R 5 million or 10 years imprisonment and/or a fine and imprisonment for a person guilty of an unlawful activity. The Act makes

allowance for the rectification of unlawful activity and may charge up to R1 million administration fees over and above the remediation costs.

NEMA makes provision for damages to be awarded by the courts where loss or damage has occurred as a result of a contravention of other environmental statutes. Importantly, NEMA provides for the liability of conviction of employees, managers, agents and directors for any offences resulting from the failure to take all the reasonable steps that were necessary under the circumstances to prevent the commission of an offence.

8. AMENDMENTS TO THE EMPr

This EMPr outlines the environmental practices and mitigation measures to be adhered to during the construction, operational phases, and rehabilitation in order to curtail and/or minimise potential negative impacts and promote sound environmental practises.

Any major issues not covered in the EMPr as submitted, will be addressed as an addendum to this EMPr, and submitted for approval. The EMPr is a living document and is subject to change from time to time in consultation with the DEA&DP. Any amendments to the EMPr will require approval from the DEA&DP.

9. ENFORCING THE EMPr

The holder of the Environmental Authorisation (EA) has a responsibility to ensure that all those people involved in the project are aware of and familiar with the environmental requirements for the project (this includes casual labour, etc.). The EA and EMPr shall be part of the terms of reference for all stakeholders.

All senior and supervisory staff members shall familiarise themselves with the full contents of the EA and EMPr. They shall know and understand the specifications of the EA and EMPr and shall be able to assist other staff members in matters relating to the EA and EMPr.

TABLE OF RESPONSIBLE PARTIES BELOW:

Responsibility	Name of Responsible Party
Applicant	Familie Roux Eiendomme Pty
Environmental Control Officer/ ECO	(To be appointed)
Site Manager	(To be appointed)

10. ENVIRONMENTAL MANAGEMENT PROGRAMME

10.1 PRE-CONSTRUCTION PHASE

Activity	Management / Mitigation	Responsibility	Frequency / Timing
Authorisations, Licences and Permits	Environmental Authorisations		
	<p>All necessary authorisations, permits and licences must be obtained by the Applicant prior to construction commencement. This includes permits for the removal of protected plants.</p> <p>The bulb species, <i>Brunsvigia orientalis</i>, was found on site within the proposed development footprint. Although not threatened, it is recommended that all individuals are rescued prior to commencement of development. Locations of individuals must be determined by a qualified botanist during the flowering period in late summer (around March) and plants rescued at an appropriate time thereafter. Plant rescue and relocation must follow the requirements of the Bitou Municipality.</p>	Applicant	Once-off
Appointment of Environmental Control Officer	Appointment of Environmental Control Officer		
	An Independent ECO must be appointed at the Applicant's cost to monitor the implementation of the EMP.		
	Fourteen (14) days written notice must be given to the Department that the activity will commence. Commencement for the purposes of this condition includes site preparation. The notice must include a date on which it is anticipated that the activity will commence which includes site preparation and demolition.		Once-off
	The nomination of the ECO must be given to DEA&DP, in writing fourteen (14) days prior to construction commencement. The notification must include contact details for the ECO and details pertaining to the ECO's relevant experience.	Applicant & ECO	
	Should the ECO for the development change at any time, this must be communicated, in writing, to DEA&DP, within fourteen (14) days of appointing the new ECO. The notification must include contact details for the ECO, details pertaining to the ECO's relevant experience and reasons for the change in ECO.		As required

Activity	Management / Mitigation	Responsibility	Frequency / Timing
Preparation of Method Statements	Method Statements		
	Method Statements must be submitted by the Applicant/ Contractor to the ECO and DEA&DP for approval. Method Statements must be adhered to by the Applicant/ Contractor. These relate to but are not limited to: <ul style="list-style-type: none"> ❖ Stormwater management ❖ Erosion control ❖ Shoring (if required) ❖ Dust control ❖ Stockpile and storage areas ❖ Site preparation and construction ❖ Installation of services and roadways ❖ Road upgrade ❖ Solid waste management ❖ Storage of hazardous materials (if applicable) ❖ Standard emergency procedures ❖ Rapid Response Plan in the event that groundwater contamination is detected during the monitoring process. 	Applicant/ Contractor	Prior to commencement of construction and during construction (if necessary)
	The ECO will monitor the implementation of the statements.	ECO	On-going
Notifying Relevant I&APs	Notice of Environmental Authorisation (EA)		
	A written notice must be given to all relevant I&APs notifying them of the EA. The notice must include a date on which the EA was received and the reference number for the EA. Commencement of construction may not begin until 21 days after the notification, provided no appeals have been lodged against the EA.	Applicant	Prior to commencement
Education of Site Staff on General and Environmental Conduct <i>A general regard for the social and ecological wellbeing of the site and adjacent areas is expected of the site staff.</i>	Environmental Awareness and Training		
	All contractors, sub-contractor and delivery personnel will be required to be briefed on the Construction Phase Management Rules (Appended to the EMP). The main contractor must do these briefings before his staff will be allowed to work on the Estate. The main contractor remains the liable person.	Contractor	Once-off and as required
	Construction staff must be adequately educated by the ECO as to the provisions included in the EMP, and in terms of general environmentally-friendly practice.	ECO	Once-off and as required
	The ECO must ensure that all staff, and if applicable, Contractors / Sub-contractors / Suppliers / Service Providers are trained on the environmental, occupational safety and/or legal responsibilities expected from them.		

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	The training must take into account language and literacy requirements as well as measures to determine the effectiveness of the training. Proof of training must be attached to the ECO's audit reports.		
	Consideration of the implications of the EA and EMPr must form part of the formal site induction for all contractors, sub-contractors and casual labourers, preferably in their native language.		
	The induction training will, as a minimum, include the following: <ul style="list-style-type: none">➤ The importance of conformance with all environmental policies;➤ The environmental impacts, actual or potential, of their work activities;➤ The environmental benefits of improved personal performance;➤ Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirement of the Consultant's environmental management systems, including emergency preparedness and response requirements; and➤ The mitigation measures required to be implemented when carrying out their work activities.		
	All contractors, sub-contractors and casual labourers must acknowledge their understanding of the EMPr and environmental responsibilities by signing an induction attendance record.	ECO	Once-off
	Staff, operating equipment, shall be adequately trained and sensitised to any potential hazards associated with their tasks.	Applicant	During staff induction, followed by on-going monitoring
	Translators are to be used where necessary during staff training.	ECO	
	The ECO must be on hand to explain more difficult / technical issues and to answer questions which may be raised.	ECO	
	Staff must be made aware that they are not to make excessive noise e.g. shouting, hooting.	ECO & Applicant	
	All employees must undergo the necessary safety training and wear the necessary protective clothing at all times.		
	No alcohol / drugs to be present on site; no vehicles or machinery are to be operated whilst under the influence of alcohol or drugs.		
	No firearms allowed on site or in vehicles transporting staff to / from the site (unless used by security personnel).		
No unsocial behaviour will be permitted.			
Bringing pets onto site is forbidden.			

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	Staff must make use of facilities provided for them, as opposed to ad-hoc alternatives (e.g. fires for cooking, the use of surrounding bush as a toilet facility is strictly forbidden). No fires to be permitted on site.		
	Trespassing on private / commercial properties adjoining the site is forbidden.		
	No worker may be forced to do work that is potentially dangerous or for what he / she is not so trained		
	The staff conduct rules are described in a separate table of rules in the EMPr. This is aimed at providing staff with the basic information regarding worker conduct on site.		
	The contractor/consultant is encouraged to provide training on best practices for erosion control, sediment management, and spill prevention to all site personnel.	Contractor	Staff induction and on-going monitoring

10.2 CONSTRUCTION PHASE

Activity	Management / Mitigation	Responsibility	Frequency / Timing
Site Management	Access	Contractor & Site Manager	On-going
	No vehicles may drive onto the adjacent properties and any other no-go areas. Site preparation must include the development of the site boundary fence. The area outside the boundary fence must be regarded as no-go area and no persons may be allowed enter such area prior to obtaining permission from the ECO.		
	Noise	Contractor & Site Manager	On-going
	Construction activities must only take place during normal working times between 07:00-17:00 on weekdays.		
	Machinery may be fitted with silences to dampen noise.		Immediately & on-going
	Staff must be reminded that they are working within a residential area and noise levels must be kept low.		
	Visual	Contractor & Site Manager	On-going
	The necessary measures be implemented during the construction phase to protect the natural vegetation, to control the noise, dust and visual intrusion.		

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	Appoint a Landscape consultant to recommend and implement the introduction of an indigenous landscape plan to protect the existing indigenous vegetation and to prepare a landscape plan for implementation in the private and common areas.		Immediate
	Implement external lighting restrictions and guidelines.		On-going
	Housekeeping		
	To ensure that the ecological integrity of the surrounding environment is maintained and preserved, the applicant and contractor must ensure that the construction footprint is limited to the construction area. The extent of the construction must be marked out to satisfaction of the engineer and ECO.	Applicant/ Contractor/ Site Manager	On-going
	The Contractor must restrict all activities, materials, equipment, and personnel within the area specified or restricted activities to areas that are necessary to undertake the work.		
	The Contractor must ensure that materials are appropriately secured to ensure safe passage between destinations, loads including, but not limited to, sandstone chips, fine vegetation or refuse must have appropriate cover to prevent pollution of adjacent properties.		
	The applicant will be held responsible for any clean-up in the 'no-go' and buffer areas resulting from failure by the contractors or suppliers to properly secure material.		
	Adequate drainage and erosion protection must be provided around the site and where necessary.		
	Access points and other cleared surfaces must be dampened whenever necessary and especially in dry and windy conditions to avoid excessive dust. Alternatively, a binding product such as Dustex (supplied by Patch Industrial Supplies) could be used.		
	Construction Vehicles		
	No vehicles are to park or operate within "no-go" areas.	Contractor & Site Manager	Immediately & on-going
	Excavators and all other machinery and vehicles must be checked for oil and fuel leaks daily. No machinery or vehicles with leaks are permitted to work on site		
	No fuel storage, refuelling, vehicle maintenance or vehicle depots to be allowed near natural spring and dam.		
	Refuelling and fuel storage areas, and areas used for the servicing or parking of vehicles and machinery, must be located on impervious bases and must have bunds around them (sized to contain 110 % of the tank capacity) to contain any possible spills. These areas must not be located within any natural drainage areas or preferential flow paths and must be located outside of buffer zones.		

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	The contractors used for the project must have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly.		
Sewage and Sanitation	Ablutions		
	Contractors must make adequate provision for drinkable water and temporary toilets situated on the building site for the use of their employees until such time as the water-borne sewer drainage is available. This must be done prior to any work done on site.	Contractor & Site Manager	Immediately & on-going
	All site temporary toilets are to be serviced and cleaned at least once a week. The contractor is to keep an onsite weekly record of the servicing/emptying of the temporary ablution facilities.		
	Unauthorised spilling of waste from the septic tank into the environment and burying of waste are strictly prohibited.		
	Ablution facilities must not cause any pollution to any water resource and it must not be a health hazard to the general public.		
Social Impacts	Communication Between Site Manager, Site Staff and I&APs		
	Should the staff be approached by members of the public or other stakeholders, they must assist them in locating the Site Manager, or provide a number on which they may contact the Applicant/ Site Manager.	Site Manager	On-going
	The conduct of the staff when dealing with the public or stakeholders shall be in a manner that is polite and courteous at all times.		
	Drivers of heavy-duty vehicles must exercise care when travelling to and from the site – and adhere to all legally enforceable requirements.		
Equipment lay-down and storage	Storage Areas		
	The contractor will be allowed to erect green storage sheds/huts within the boundaries of the building site and to a maximum height of 2,4 m. The position of such structures must be indicated on the site diagram, which must be approved by the ECO.	Site Manager/ Contractor & ECO	On-going
	Choice of location for equipment lay-down and storage areas must take into account prevailing winds, distances to “No Go” areas, general on-site topography and water erosion potential of the soil. Impervious surfaces, bunded areas or drip trays must be provided where necessary.	Site Manager & Contractor	On-going
	Material stockpiles must be protected against rain and flooding.		
	Equipment lay-down and storage areas must be designated, demarcated and signed.		
Erosion and Stormwater Control	Soil erosion and runoff		
	Soil disturbance during the removal of alien invasive plants must be minimised as much as possible.	Site Manager & Contractor	On-going

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	Storm water control must be undertaken to prevent soil loss and erosion impacts from the site.		
	Erosion prevention and control measures must be implemented. This may be by the use of mulch bags or silt fences. The engineer must provide a method statement for site specific erosion methods.		
	Provision shall be made for storm water management measures that will ensure effective run-off control and prevent erosion at run-off points.		
	Continuous monitoring for evidence of erosion must be undertaken around the site.		
	The stockpiling of topsoil for use in rehabilitation is required		
	Stockpiles must not exceed 1.5m in height, must be covered with shade cloth or similar, to prevent erosion and any invasive alien species that begin to grow within it must be removed.		
	The site must be stabilised where necessary using available materials, where possible. It is recommended that exposed soils are covered with wood chips, and tree branches used to create berms. Any cut alien vegetation on site can be utilised for this purpose if it is without seed.		
	Installation of services and roadways		
	Topsoil removed for trenching along the route for installation of services to be stockpiled and replaced as the final compacted layer.	Site Manager / Contractor & ECO	During service installation
	Pipelines to be placed in consultation with and to recommendations of the ECO.		Following completion installation of services
	Regular compaction tests to be done to ensure adequate soil compaction in pipeline trenches.		
	Install a series of berms across the internal access road to retard flow from higher areas.	Site Manager & Contractor	Throughout the duration of the project
Conservation of the Natural Environment	Clearing of vegetation		
	Prior to the commencement of clearing the proposed building site, the contractor must undertake vegetation search-and-rescue on the site. This operation is a legal requirement to ensure that any endangered vegetation species is transplanted prior to work commencing on the erf.	Site Manager, Contractor & ECO	Immediately
	Areas which are identified by the Environmental Control Officer (ECO) as being ecologically sensitive on or adjacent to the site are to be suitably demarcated to prevent damage by construction practices. These areas are to be recognised as “no-go” areas.		

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	Wherever there are sections of undisturbed natural habitat within the development area, they must not be impacted by the building activities and must be conserved as small islands of natural resources for the small wildlife of the area.	Site Manager & Contractor	Immediate and On-going
	Indigenous vegetation that is removed is to be replanted either back to the point from which it was taken or must be replaced by new relevant indigenous vegetation.		
	Access by heavy machinery must be limited on the site.		On-going
	Only areas necessary for the development footprint must be cleared and the remainder of the property must be left natural.		Immediate and On-going
	Laydown areas for construction materials must be contained within the clearing footprint of the proposed development.		
	Permission must be attained from the relevant authority (DEFF) to remove any of the protected Milkwood trees (<i>Sideroxynon inerme</i>) that occur on the properties.		Immediately
	Fauna and Flora		
	All alien invasive plant species must be continuously removed around the site. The best way to do this is to remove the plants from the roots by hand and leave the plants in the sun to dry out and die before disposal. Please refer to the Alien Plant Control Programme.	Site Manager & Contractor	On-going
	Disturbance to birds, animals and reptiles and their habitats must be minimized wherever possible.		
	Retain existing large trees within proposed development.		Immediately
	If any trees need to be removed or pruned then a permit is required, according to the National Forests Act.		
	Preservation of natural habitats		
	A 20-meter buffer zone must be retained along the base of the slope to protect the forest margin. Steps must be taken to rehabilitate the buffer zone and forest margins and to encourage growth of species, such as <i>Pterocelastrus tricuspidatus</i> and <i>Sideroxylon inerme</i> , that are mesic and fire-resistant.	Site Manager & Contractor	Immediate and On-going
	An open space management system must be developed to formalize steps for forest protection.		
	Access to forested areas during construction must not be permitted by any construction personnel. These areas must be fenced off and no access allowed.		
	Compile and implement an alien management plan, which highlights control priorities and areas and provides a programme for long-term control.		

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	Rehabilitate and improve the small dam on site, including introducing pond margin vegetation typical of mountain ponds in forested areas. This will provide good habitat for various frogs, including potentially <i>Afrivalus knysnae</i> .		
	Undertake regular monitoring to detect alien invasions early so that they can be controlled, as per the Alien Management Plan.		
	Rehabilitation of disturbed areas, as well as previously invaded areas, must promote establishment of site-appropriate indigenous species.		
	Plant additional milkwoods in the development as part of the final landscaping. These can be planted along with other appropriate coastal forest species, but the proportions and composition must reflect habitat that would have occurred naturally at this site.		
	A Landscape consultant must be appointed prepare a landscape plan for implementation in the private and common areas.		
Conservation of Water Resources	Aquatic Biodiversity		
	A list of wetland plant species below which can be planted around the margins of the pond to improve habitat for amphibians and water quality for wildlife making use of the pond. These plants can also be used in the stormwater ponds and are strongly recommended as alternatives to <i>Typha capensis</i> or <i>Phragmites australis</i> , both of which can become dominant and weedy, although they are indigenous. <i>Isolepis prolifera</i> ; <i>Eleocharis limosa</i> ; <i>Persicaria decipiens</i> ; <i>Wachendorfia thyrsiflora</i> ; <i>Falkia repens</i> ; <i>Juncus lomatophyllus</i> ; <i>Juncus effusus</i> .		
	Pre-construction erect temporary fencing along the entire green corridor and open space to protect the pond as well as the corridor from impact during construction.		
	Add signage to the fence indicating the area as No-Go.		
	Site inductions for all staff must ensure contractors and works area aware they may not enter the pond and spring area.		
	Groundwater		
	It is strongly recommended that the monitoring network be installed prior to the commencement of the proposed development. This will ensure that data is available to monitor groundwater quality and levels from the outset and allow for early detection of any potential issues during the construction phase. This network will also be essential for monitoring during the operational phase to ensure continuous assessment of groundwater quality and levels and to detect any contamination, recharge and flooding risks promptly.	Applicant	Prior to commencement

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	<p>At least four monitoring piezometers must be installed to effectively detect any potential contaminants and enable monitoring of groundwater quality and levels over time.</p> <p>To track changes in groundwater quality, water levels and chemical parameters must be recorded monthly from each of the installed piezometers. Additionally, effluent quality must also be regularly tested to assess the potential impact of the wastewater treatment plant (WWTP).</p> <p>All groundwater and effluent samples must be sent to an accredited SANAS laboratory for analysis. Sample collection, handling, and transport must strictly adhere to laboratory standards to ensure the accuracy and integrity of the results.</p> <p>A rapid response plan must be developed in the event that any contamination is detected during the monitoring process. This plan must include clear procedures for identifying the source of contamination, containing the issue, and mitigating any potential environmental impacts. It must also outline specific actions to address contamination quickly and effectively, reducing the risk of groundwater or environmental degradation.</p>		
Waste Management	On-Site Waste Management		
	The excavation and use of rubbish pits is forbidden.	Site Manager & Contractor	On-going
	Burning of waste is forbidden. <i>A possible exception to this may be that the alien invasive vegetation which is removed from the site should be burned to prevent the spread of the plants. The transportation of Alien Invasive Plants is strictly forbidden in terms of the Conservation of Agricultural Resources Act (CARA), especially if in seed; unless stored in a completely sealed container.</i>		On-going and monitored weekly
	Littering on the site is forbidden and the site shall be cleared of litter at the end of each working day.		On-going monitoring
	An adequate number of general waste bins must be arranged around the site to collect all domestic refuse, and to minimise littering.		
	Solid waste must be managed and separated into recyclable and non-recyclable and disposed of accordingly.		
	Adequate sanitary facilities and ablutions must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation).		

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	The contractor must make adequate provision for removal of building rubble and excess material. No material or building rubble will be spoiled on the property. Stockpiling of sand to be completely covered with netting or hessian.		
	No dumping of construction material within natural areas or buffer zones may take place.		
	The buffer and "no-go" areas must be monitored on a weekly basis to clean-up any waste that may have been blown from the construction site.		Weekly
	Waste must be removed from the site on a weekly basis.		
Handling of Hazardous Materials (if necessary)	Hazardous Materials		
	Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. Where possible and available, MSDSs must additionally include information on ecological impacts and measures to minimize negative environmental impacts during accidental releases or escapes.	Site Manager & Contractor	On-going
	Cement and other potential environmental pollutants must be stored within an impermeable bunded, roofed and sign posted area.		
	The mixing of cement must be done on Rhino board.		
	All empty contaminated containers must be stored within a hazardous bunded area until collection by a reputable hazardous waste collection company. Waybills must be presented to the ECO for review and filing purposes.		
	No vehicles transporting hazardous materials to the site may be washed on or near site. They must return to the supplier of such material to be cleaned out.		
Cultural Environment	Archaeology and Artefacts		
	No structures older than sixty years or parts thereof are allowed to be demolished altered or extended without a permit from Heritage Western Cape.	Site Manager & Contractor	Immediate and On-going
	If any archaeological sites/materials are exposed, mitigation regarding the finds must be conducted with the Heritage Western Cape regarding the destiny of the material. Examples of heritage resources are as follow: <ul style="list-style-type: none">• Human remains• Coins/Gold/Silver• Fossils• Fossils shell middens/ marine shell heaps• Pottery/ceramics		

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	If Heritage Western Cape agrees to the removal of the material, an archaeologist must apply for a permit to scientifically excavate/collect the material.		
	All costs must be financed by the applicant. This may include: All monitoring and mitigation expenses regarding the excavations/collecting of material, travel, accommodation and subsistence, analysis of the material, radiocarbon date(s) of the site(s) and a one-off curation/storage fee payable to the Western Cape Repository for Archaeological material.		
Safety and Security	Safety and Security On-Site		
	Material stockpiles or stacks must be stable and well secured to avoid collapse and possible injury to site workers / local residents.	Site Manager & Contractor	On-going
	Firefighting equipment must be present on site at all times. All equipment on site must be used in accordance with the Occupational Health and Safety Act regulations of South Africa (OHSA), Act No. 85 of 1993); staff must be trained in firefighting procedures.		
	No unauthorised person may be permitted to enter the site without prior permission of the site manager.		
	Fire Management		
	Firefighting equipment must be present on site at all times as per Occupational Health and Safety Act.	Site Manager & Contractor	On-going
	No fires will be allowed on any part of the property including the building site. Fire extinguishers are required to be on all sites at all times.		
	All project staff must be trained in fire hazard control and firefighting techniques and know the proper procedure in case of a fire occurring on site.		
	All flammable substances must be stored in dry areas which do not pose an ignition risk to the said substances.		
	No open fires will be allowed on site.		
	Smoking must not be permitted in areas considered to be a fire hazard.		

10.3. OPERATIONAL PHASE

Activity	Management / Mitigation	Responsibility	Frequency / Timing
Vegetation Rehabilitation – progressive rehabilitation must be carried out	Vegetation		
	All disturbed areas, or areas which have been disturbed for the purpose of the development, are to be re-vegetated. This will aid in preventing erosion within the site. A 100% indigenous planting plan must be adhered to in terms of all planting carried out on the site. Consultation must be made with a Horticulturist or Botanical Specialist for a site-specific vegetation list.	Contractor & ECO	Project completion
	Erosion prevention and control measures must be implemented. Organic mulch or sand bags must be used to contain all sediment and prevent erosion during rehabilitation.	Site Manager & Contractor	Rehabilitation
	All rehabilitated areas must be maintained through weekly inspections until an acceptable success rate has been achieved.	Contractor & ECO	Post Construction/ Weekly
	Encroachment of invasive alien plants in this regard will need to be monitored on a regular basis to prevent re-infestation. This would need to be undertaken by the ECO or a designated specialist.	Site Manager / Contractor & ECO	Project completion and Maintenance
	Landscaping		
	Investing landowners within the proposed development must be encouraged to avoid planting exotic plants in their garden areas in favour of locally indigenous plants.	Site Manager & Contractor	Project completion
	A Landscape consultant be appointed to recommend and implement the introduction of an indigenous landscape plan to protect the existing indigenous vegetation and to prepare a landscape plan for implementation in the private and common areas.		
	All disturbed open space areas are to be rehabilitated using locally occurring indigenous vegetation.	Site Manager / Contractor & ECO	Project completion and Maintenance
	Pond and buffer area		
	Indigenous plants found in adjacent thickets may be planted around the pond. Only indigenous plants found in the immediate surrounding area may be planted.	Site Manager / Contractor	Rehabilitation

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	A list of recommended wetland plants for that can be used to improve vegetation cover of muddy areas and marginal areas of the pond is provided. <i>Isolepis prolifera</i> ; <i>Eleocharis limosa</i> ; <i>Persicaria decipiens</i> ; <i>Wachendorfia thyrsiflora</i> ; <i>Falkia repens</i> ; <i>Juncus lomatophyllus</i> ; <i>Juncus effusus</i> .	Site Manager & Applicant Site Manage	On-going
	Do not place any fish into the pond as only alien invasive fish to the area would survive and could be transferred to other waterbodies on the feet of animals or birds.		
	Indigenous plants found in adjacent thickets may be planted around the pond. The only plants that must be removed from the area are listed alien invasive species.		
	Landscaping and gardening staff must not undertake any clearing of vegetation inside of the 10m buffer.		
	The only plants that must be removed from the area are listed alien invasive species.		
Landscape Connectivity	Minor wildlife linkages		
	Rehabilitate and maintain secondary vegetation area to form part of the open space system within the development, which will link up with the forest area.	Site Manager	On-going
	The proposed open space system must correspond to the position of indigenous vegetation.		
	An open space management system must be developed and followed to formalize steps for forest protection.		
	Permeable fencing		
	Wherever fences are needed in the development area and on its boundary, it will be necessary to ensure that wildlife can move through the fences to enable their movement across the landscape. Consultation with CapeNature will be required to determine the best methods to use and spacing of permeability. It will also need to be determined where wildlife crosses the fence line. Permeability of the fence will be done according to CapeNature's requirements.	Site Manager, Contractor & ECO	Project completion
	fencing around the property must be visible to wildlife, including birds, by fitting reflective or colourful weather-resistant flags (e.g., aluminum, or plastic strips) to the wire.		
No fencing be permitted along the eastern and western boundaries of the conservation area (including the 20m corridor) to form a continuous corridor with neighbouring properties.			

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	Fencing must not extend into the corridor on the neighbouring boundaries as the aim is to have an inter-connected corridor that extends across properties, should development occur in adjacent areas.		
	Use clearVu fencing to separate the corridor from the development area. The spring must be incorporated into the corridor. The fence is to keep domestic animals (cats and dogs, etc) out of the wildlife corridor.		
Wildlife interaction	Light Pollution		
	Lighting within the development should be minimised as far as possible. Use motion detector lights / bollards instead of tall lights along streets. Minimise insect attraction to lights by installing yellow spectrum vs blue spectrum lights. Provide specifications to all residents for their outdoor lighting and recommend that motion sensor lights be installed instead of permanent lights through the HOA.	Site Manager / HOA	Immediately after construction
	Install down lighting that focuses light towards the ground reducing glare and improving visibility.		
	Installing hoods or shields on light fittings, angling lighting correctly, and fitting downlights under the overhang to help reduce sky glow.		
	Noise Pollution		
	Dense planting along the corridor side of the fencing should be done using plant species found on the site. This will aim to screen light and sound from the development.	Site Manager / HOA	Immediately after construction
	Restrict noisy activities to daylight hours to avoid disturbing nocturnal species that rely on natural quiet at night for foraging, navigation, and communication.		On-going
	Domestic predators		
	Dogs must be kept within a fenced home area. Cats must be kept in-doors at night which is when they do most of their hunting.	Site Manager / HOA	On-going monitoring
	Ecological Corridor		
	No garden waste disposal over the fence line into corridor. This must be strictly enforced by the HOA as it will smother indigenous vegetation and introduce alien / exotic species.	Site Manager / HOA	On-going maintenance and monitoring
	No landscaping, mowing or weedeating should be permitted in the corridor. Only clearance of alien vegetation should be allowed		
	The fence can have a pedestrian gate or two which can be kept locked. No electric fencing should be permitted. If security is required, cameras can be used to monitor fence lines.		

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	Recreational use of the corridor should be restricted to walking (no dogs) and bird-watching during daylight hours only. The gates should be locked and access restricted from dusk to dawn. No mountain biking should be permitted as this causes too much disturbance.		
Alien Invasive Plants	Alien plant eradication		
	All invasive alien plants must be completely cleared from the property, and where a tree or bush cover is desired, replaced with suitable indigenous species. Section 11 details methods for Alien Invasive Plant Control.	ECO & Site Manager	Immediate and On-going
	An Alien Invasive Plant Control Plan must be implemented, as encroachment of alien vegetation may increase as a result of the construction process disturbances.		
	Any action taken to control and eradicate a listed invasive species must be executed with caution and in a manner that may cause the least possible harm to biodiversity and damage to the environment.		
	The methods employed to control and eradicate a listed invasive species must also be directed at the offspring, propagating material and re-growth of such invasive species in order to prevent such species from producing offspring, forming seed, regenerating or re-establishing itself in any manner.		
Landscaping, Gardening and Maintenance	Land Rehabilitation		
	Rehabilitation must be executed in such a manner that surface runoff will not cause erosion of disturbed areas during and after rehabilitation.	Contractor	Project completion
	Any rubble is to be removed from site to an appropriate disposal site. Burying of rubble on site is prohibited.		On-going
	The site is to be cleared of all litter.		
	The surface of all disturbed areas must be left rough to facilitate binding of topsoil and vegetation.		
	Areas that are disturbed through building activities (such as the excavations for sewerage pipelines) must be suitably rehabilitated without delay. Failure to do so will have a knock-on effect on biodiversity in the form of an increase in wind erosion, soil exposure and a loss of the soil micro-organisms that are essential for plant growth. Use complete cover of locally chipped woody material (for example Acacia cyclops stems and branches but not the seed pods).		Progressive rehabilitation
	Pond and buffer area		
	Landscaping and gardening staff must not undertake any clearing of vegetation inside of the 10m buffer.	Site Manager	On-going

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	A bird hide in the buffer to spot wildlife would be acceptable, but no additional recreational activities. The point is to create a quiet habitat with suitable vegetation cover for continued use by animals, birds etc.	Applicant	Project completion
Removal and Repair of Materials and Infrastructure	Materials and Infrastructure		
	All material used for the construction must be removed from site after construction.	Contractor	Project completion
	The Contractor must repair any damage that the construction works may have caused to adjacent areas.		
	Fences, barriers and demarcations associated with the construction phase are to be removed from the site unless stipulated otherwise by the ECO.		
	All areas where temporary services were installed are to be rehabilitated to the satisfaction of the ECO.		
Stormwater Management	Increased stormwater runoff		
	Stormwater must be diverted to detention ponds on the site which are indicated on various SDP layouts and are consistent with the SUDS approach to stormwater management.	Applicant / Contractor	Project completion
	Use rainwater collection tanks to serve as a retention vessel in downpours.		
	Stormwater from erven must be attenuated on site as far as possible. Stormwater from access roads must be attenuated onsite (prior to any discharge into retention ponds).		
	The runoff velocity of stormwater must be reduced with energy dissipaters prior to discharge into retention ponds.		
	No stormwater infrastructure to be directed towards the pond.		
	The natural spring and small dam must be protected by a 10 m buffer throughout the operational phase.		On-going
	No stormwater must be put into this dam as the water is of high quality.		
	Routine maintenance inspections to clear windblow / discarded litter from the pond and spring.		
	Impervious surfaces and foundations		
	Stormwater management must encourage infiltration of water into the soil profile and other onsite attenuation through the use of grass pavers etc.		
Waste	Removal of Hazardous and Non-Hazardous Waste		
	All hazardous materials and containers must be collected by a reputable hazardous waste collection company and disposed of appropriately.	Contractor	Project completion

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	Collection and disposal of non-hazardous waste to a registered landfill site must occur at least once a week.	Site Manager	During Operational phase
	Residents must be made aware of the dangers that accompany the irresponsible use of harmful chemicals.	Site Manager	During Operational phase
Fire management	No burning of vegetation to be permitted.	Site Manager	On-going
	Ensure that no refuse waste is buried or burnt on the site or surrounds.		
	Smoking must not be permitted in areas considered to be a fire hazard.		
	Undeveloped areas must be managed so that they do not pose a fire risk.		
	The Southern Cape Fire Protection Association must be consulted regarding firebreaks, and fire management for the property in case of wildfires.		During Operational phase
	The responsibilities of people in control of land - All owners on whose land a veldfire may start or burn or from whose land it may spread must: <ul style="list-style-type: none"> • prepare firebreaks on their side of the boundary if there is a reasonable risk of veldfire • have such equipment, protective clothing and trained personnel for extinguishing fires as are: prescribed (in the regulations) • If there are no regulations, reasonably required in the circumstances take all reasonable steps to notify the FPO of the local FPA (if there is one) when a fire breaks out do everything in their power to stop the spread of the fire. 		
	The Act also requires that if the owner is absent, he or she must have a responsible person present on or nearby his or her land to: <ul style="list-style-type: none"> • extinguish a fire if one broke out, or assist others to do so. • take all reasonable steps to alert the neighbours and the FPA (if there is one). • The owner may appoint an agent to act on his or her behalf to perform these duties. 		
	Implement regulations/rules around “braai” fires /open flame fires especially when high fire danger weather conditions are predicted.		
	Ensure that access roads are kept clear in order for firefighting vehicles to have unobstructed access to the structures/houses.		
	Work collaboratively with local authorities to develop an emergency preparedness plan that outlines the steps to take in the event of a fire. The plan		

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	must include protocols for notification, evacuation, and communication with local authorities.		
	The goal of the management plan must be to prevent wildfires from starting and spreading within the development and to minimize the impact of any fires that do occur.		
	Residents, security guards, and estate manager must report any sign of smoke or a vegetation fire immediately to their local Municipal Fire and Rescue Services.		

11. ALIEN PLANT CONTROL PROGRAMME

Please consult a Botanical specialist before attempting to remove Alien Invasive Plants.

11.1. INTRODUCTION

Benefits of control

- Elimination of spread of these species into non-affected areas.
- Improvement of water quality and quantity.
- Legal compliance: landowners are required to eradicate or control declared weed and alien invader plants in terms of the Conservation of Agricultural Resources Act 43 of 1983 and the National Environmental Management: Biodiversity Act 10 of 2004.
- Improvement of biodiversity in conservation areas. Fast growing invader plants suppress indigenous flora, with a resultant loss in overall biodiversity.
- Commercial reasons: alien vegetation can spread from conservation areas into production land resulting in greater weed control costs.

Important factors influencing the effectiveness of a control programme

- Timely implementation of control operations is important for alien plants.
- Operations must be directed towards killing alien vegetation. This is best achieved by using an effective herbicide chosen by the ECO and applied by using the "cut-stump; frilling or ring barking methods. Under no circumstances may spraying with a "Rose" or multi- stream nozzle head be done.

Requirements for an effective alien vegetation control programme

- Identify the problem: extent, location and species of problem plant.
- Divide the problem areas into manageable units, taking budget and resource constraints into account.
- Identify any sensitive ecosystems, rare or endangered plants etc. which may be affected by a control programme. Identify the original ecosystem applicable to the area.
- Make provision for a number of follow up operations. The initial clearing operation is only part of the total programme. Failure to follow up will result in a failure of the entire programme.

While the importance of removing or clearing of alien or exotic vegetation is recognised, there should be control over the way in which this takes place. Often what generally appears to be covered by alien vegetation, actually contains pockets of sensitive vegetation or protected species. It is for this reason that clearing of such areas must be undertaken by hand (*Guidelines for the Control and Management of Activities in Sensitive Coastal Areas, first edition, 1998*).

It is important to note that all of the above must be performed with instruction by the ECO, as well as in the presence of an ECO at all times.

11.2. LEGISLATION

The National Environmental Management Act, No 107 of 1998, creates a duty of care towards the environment. Within the preface of this Act, it is stated thus:

"Everyone has the right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development: the environment is a functional area of concurrent national and provincial legislative competence, and all spheres of government and all organs of state must co-operate with, consult and support one another."

Any person or business found to be responsible for illegally introducing an invasive plant or species, and allowing it to spread, may be compelled, by this Act to desist with their actions and remove the source of invasion.

The Conservation of Agricultural Resources Act, No 43 Of 1983 (CARA) was passed to protect soil, water resources and vegetation. This included measures to manage and control weeds and invader vegetation species. The CARA regulations declare several species of "weeds" or "invader plants." These species have been divided into three categories:

Category 1a Listed Invasive Species:

Category 1a Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the National Environmental Management: Biodiversity Act/ NEMBA (Act 10 of 2004) as species which must be combatted and eradicated.

A person in control of a Category 1a Listed Invasive Species must-

- (a) comply with the provisions of section 73(2) of the NEMBA;
- (b) immediately take steps to combat or eradicate listed invasive species in compliance with sections 75(1), (2) and (3) of the NEMBA; and
- (c) allow an authorised official from the Department to enter onto land to monitor, assist with or implement the combatting or eradication of the listed invasive species.

If an Invasive Species Management Programme has been developed in terms of section 75(4) of the NEMBA, a person must combat or eradicate the listed invasive species in accordance with such programme.

Category 1b Listed Invasive Species:

1) Category 1b Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the NEMBA as species which must be controlled.

2) A person in control of a Category 1b Listed Invasive Species must-

(a) control the listed invasive species in compliance with sections 75(1), (2) and (3) of the NEMBA.

(b) must allow an authorised official from the Department to enter onto the land to monitor, assist with or implement the control of the listed invasive species, or compliance with the Invasive Species Management Programme contemplated in section 75(4) of NEMBA.

3) If an Invasive Species Management Programme has been developed in terms of section 75(4) of the NEMBA, a person must combat or eradicate the listed invasive species in accordance with such programme.

Category 2 Listed Invasive Species:

1) Category 2 Listed Invasive Species are those species listed by notice in terms of section 70(1)(a) of the NEMBA as species which require a permit to carry out a restricted activity within an area specified in the Notice or an area specified in the permit, as the case may be.

2) Unless otherwise indicated in the Notice, no person may carry out a restricted activity in respect of a Category 2 Listed Invasive Species without a permit.

3) A landowner on whose land Category 2 Listed Invasive Species occurs or person in possession of a permit, must ensure that the specimens of the species do not spread outside of the land or the area specified in the Notice or permit.

4) Unless otherwise specified in the Notice, any species listed as Category 2 Listed Invasive Species that occurs outside the specified area contemplated in sub-regulation (1), must, for purposes of these regulations, be considered to be a Category 1b Listed Invasive Species and must be managed according to Regulation 3 above.

5) Notwithstanding the specific exemptions relating to existing plantations in respect of Listed Invasive Plant Species published in *Government Gazette* No. 37886, Notice 599 of 1 August 2014 (as amended), any person or organ of state must ensure that the specimens of such Listed Invasive Plant Species do not spread outside of the land over which they have control.

6) If an Invasive Species Management Programme has been developed in terms of section 75(4) of the NEMBA, a person must combat or eradicate the listed invasive species in accordance with such programme.

Category 3 Listed Invasive Species:

1) Category 3 Listed Invasive Species are species that are listed by notice in terms of section 70(1)(a) of the NEMBA, as species which are subject to exemptions in terms of section 71(3) and prohibitions in terms of section 71A of the NEMBA, as specified in the Notice.

2) Any plant species identified as a Category 3 Listed Invasive Species that occurs in riparian areas, must, for the purposes of these regulations, be considered to be a Category 1b Listed Invasive Species and must be managed according to regulation 3 below.

3) If an Invasive Species Management Programme has been developed in terms of section 75(4) of the NEMBA, a person must combat or eradicate the listed invasive species in accordance with such programme.

Should any invasive plant species occur, other than those stated in The Act, the land user must control them by species-specific control methods. Caution should ALWAYS be taken when dealing with noxious chemicals, and care should be taken to cause the least amount of harm to the environment.

11.3. Ways to Eradicate Invasive Alien Plants

This IAP eradication and control program comprises the following three steps:

Step 1

The first step of the Invasive Alien Plant Eradication Programme will be to undertake an inception and educational meeting, where the people employed to undertake this activity are able to identify the correct species as aliens and the manner in which to remove and control them.

Step 2

The second step will be to identify the Invasive Alien Plants (IAP) and start a process of removing the individuals that occur on the site. The removal of the alien species must be in a stepwise manner and be undertaken within a single area at a time. This will ensure that all individuals are removed at the same time to reduce re-infestations. Below are a number of methods that may be employed to undertake the activity of removing alien plant species. These methods are dependent on the size and nature of the plant that is to be removed.

11.3.1. Managing IAP Invasions

Once an invasion has been identified and quantified there are four methods that managers and landowners can take to deal with IAPs that includes prevention of new infestations and the early identification and eradication, containment or suppression of existing invasions. In the case of introduced, naturalised or invasive species, pre-introduction measures are no longer possible (apart from preventing additional introductions), therefore post-introduction management is focused on controlling infestations with chemical, mechanical or biological means.

❖ Prevention

This includes the monitoring of the area so that new infestations can be prevented. This also includes rehabilitating disturbed areas and keeping the disturbance of natural areas to a minimum.

❖ Early identification and eradication

When an IAP is spotted during prevention monitoring it must be swiftly dealt with using the methods described below.

❖ **Containment, control, and suppression**

If there are already an established infestation of an IAP on site which cannot be eradicated, then it should be contained to the site. New propagules should be removed so that the infestation doesn't worsen. Efforts should be made to ensure the infestation is reduced as far as physically and economically possible.

11.3.2. Mechanical Methods

❖ **Hand-pulling**

This method of removal is only really an option during the summer months and when the IAP that are requiring removal are very small, and their root system is not very well established. The only precautionary note here is that many alien plant species may look similar to indigenous species when they emerge, so the labour force must be extremely well versed in the individuals that will require removal.

❖ **Up-rooting**

This method is similar to hand-pulling but is undertaken on slightly older individuals of the target species. It only has one drawback; a relatively large area can be disturbed with the soils being altered and opening the area up to re-infestation.

❖ **Lasso & Winch**

This method is the upgraded version of the up-rooting, with the same principles applying, that is of trying to remove the entire plant with all the root system attached, to prevent re-growth. This can have a serious destabilizing effect on the receiving environment and should definitely not be undertaken on slopes or sandy soils.

❖ **Cutting / Slashing**

This method is not a suitable method for control and long term management if used as a stand-alone technique because many of the IAP will simply coppice or re-sprout during the summer periods. Many, if not most, alien plants species are annual species, and through their natural life strategy (r-selected) are able to withstand disturbance, even extreme disturbance as in this instance.

❖ **Ring-barking**

This involves the removal of bark in a 30 centimetre band. This technique is used to desiccate the plant through killing the phloem and xylem and thus preventing transpiration. Further it also facilitates pathogen infestation. It is very effective on large trees if undertaken correctly.

❖ **Strip-barking**

As with ring-barking, just at a larger scale.

❖ **Frilling / Girdling**

Girdling and frilling are methods of killing standing trees that may be done with or without an herbicide. Girdling involves cutting a groove or notch into the trunk of a tree to interrupt the flow of sap between the roots and crown of the tree. The groove must completely encircle the trunk and should penetrate into the wood to a depth of at least 1.5 centimetres on small trees, and 2.5 to 4 centimetres on larger trees. Girdling can be done with an axe, panga or chain saw. When done with an axe or panga, the girdle is made by striking from above and below along a line around the trunk so that a notch of wood and bark is removed. The width of the notch varies with the size of the tree. Effective girdles may be as narrow as 2.5 to 5 centimetres on small-diameter trees, and as wide as 15 to 20 centimetres on very large-diameter trees. When a chain saw is used to girdle, two horizontal cuts between 5 and 10 centimetres apart are usually made completely around the tree when no herbicide is used and one horizontal cut is made completely around the tree when herbicide is used.

Frilling is a variation of girdling in which a series of downward angled cuts are made completely around the tree, leaving the partially severed bark and wood anchored at the bottom. Frilling is done with an axe or panga.

By themselves, girdling and frilling are physical methods to deaden trees that require very little equipment and may be done without herbicides. Both techniques require considerable time to carry out, particularly with an axe or panga. The effectiveness of girdling and frilling depends on the tree species and on the size and completeness of the girdle or frill. To be effective, girdles and frills must completely encircle the tree. Because frills can heal-over more easily, girdling is usually more effective.

The effectiveness of both girdling and frilling can be increased by using herbicides. With frilling and girdling, water soluble forms of herbicides are most commonly used to get maximum movement of herbicide within the plant. When using water-soluble herbicides, the herbicide/water mixture is commonly applied by squirting it on the girdle or frill until the cut surface is wet. Hand-held, spray bottles, such as those available at local garden stores, are ideal for applying herbicide to the girdle. Again, note that a single, rather than double chain saw girdle is used when a water soluble herbicide is to be applied.

11.3.3. Chemical Methods

The use of chemicals in controlling and removing of IAP should not be excluded as a possible option. Once the IAP are more manageable the use of chemicals should be reduced or excluded completely. The best option would be to pursue a combination of mechanical and chemical control in the early stages.

The only negative impact of the use of chemicals is that if used incorrectly may result in plant species being able to develop some form of resistance to the herbicide. If herbicides are used as a foliar spray, drift will cause non-target species to be impacted upon. The only method that should be

undertaken is the cutting of the plants prior to the treatment of the remaining stems using a “stem painting” technique.

It is imperative that the herbicides used are dye treated or that the end-user add a dye to ensure that all stems that have been treated are easily identified. Note, the application of the chemical solution must follow directly after the cutting of the vegetation. Therefore, a small area should be selected and all cutting and stem painting be undertaken on that area prior to moving to the next area.

DFFE herbicide quantity estimation ([Invasive alien plant control management plan | Department of Environmental Affairs \(dffe.gov.za\)](#)) is attached to this document as a guide.

11.3.4. Biological Control

This entails using a natural enemy (bacteria, fungus, weevils, mites) of the intended IAP to attack specific parts of the plant (roots, stem, flowers) to either kill the plant, reduce its vigour, or reduce reproductive output. Only certain species have registered bioagents, the most successful stories of biocontrol being the *Opuntia* genus and *Acacia* species. Please contact DFFE or SANBI for directions on how to obtain these agents.

DFFE have provided a guide on bio-control agents for terrestrial plant species ([Invasive alien plant control management plan | Department of Environmental Affairs \(dffe.gov.za\)](#)), attached to this document.

11.4. Environmental Safety

In order to minimise the impact of the operation on the natural environment the following must be observed.

- ❖ Area contamination must be minimised by careful accurate application with a minimum amount of herbicide to achieve good control.
- ❖ All care must be taken to prevent contamination of any water bodies. This includes due care in storage, application, cleaning equipment and disposal of containers, product and spray mixtures.
- ❖ Equipment should be washed where there is no danger of contaminating water sources and washings carefully disposed of at a suitable site.
- ❖ To avoid damage to indigenous or other desirable vegetation product should be selected that will have the least effect on non-target vegetation.
- ❖ Coarse droplet nozzles should be fitted to avoid drift onto neighbouring vegetation, e.g. TG-1 or equivalent.
- ❖ The correct protective clothing is to be used in line with manufacturer's instructions and / or the Occupational Health & Safety Act, Act 85 of 1993 (and amendments) and,

- ❖ All MSDS sheets are to be made available on site along with a Medical First Aid Kit.

11.4.1. Disposal of IAP Vegetation

- ❖ Plant material should be used beneficially wherever possible, as opposed to disposing of it at a landfill site where it takes up valuable airspace, or let it further propagate on unchecked, vacant land.
- ❖ Woody and dry material, provided no seeds are present, can be chipped and used as mulch or made available to the local community for firewood.
- ❖ Wet material and aquatic weeds should be combined with other organic matter and composed. Alternatively, it may be possible to use it for basket making, animal feed or other uses.
- ❖ Burning of alien vegetation waste material is prohibited.
- ❖ Burying of alien vegetation waste material in or near the stream, drainage lines, dams, wetlands and their buffer zones is prohibited.
- ❖ Any vegetation which is not viable for use must be disposed of at a registered disposal unit.

11.5. LIST OF INVASIVE ALIEN PLANT SPECIES

Please consult a Botanical specialist or Horticulturist to identify Invasive Alien Plants before attempting to undertake IAP removal.

IAP species that occur on the site according to the Plant, Animal & Terrestrial Biodiversity Study:

Name	Common Name	Category
<i>Acacia cyclops</i>	Rooikrans	1b
<i>Pinus</i> sp	Pine	2
<i>Paraserianthes lophantha</i>	Stink bean	1b
<i>Cenchrus clandestinus</i>	Kikuyu grass	Naturalized exotic
<i>Solanum linnaeanum</i>	Devil's apple	Naturalized exotic
<i>Vicia sativa</i>	Vetch	Naturalized exotic
<i>Yucca aloifolia</i>	Spanish bayonet	Naturalized exotic

MANAGEMENT TREATMENTS SUMMARY GUIDE - Terrestrial

Complied by: T. Bold, WIV Nat.Ori.CI

Updated 25 May 07 - TB

TREATMENT DETAIL				APPLICATION DETAIL				PLANNING DETAIL		
Species	Size class	Treatment	Herbicide	Dosage	a.i. Litres	Mix Litres	% Mix a.i.	Density	Estimated Product Litres / Ha (or kg)	if Mix volume Litres / Ha
Wattle - Rooikrans, Red-eye (Acacia cyclops)	Seedlings	Hand pull	None							
	Seedlings, saplings and coppice	Foliar spray	clopyralid / triclopyr (-amine salt) 90 / 270 g/L SL Confront 360 SL (L7314)	50ml / 10 Litres water and 0.5% Wetter & Dye	0.05	10	0.5	Closed / Dense	1.50	300
			fluroxypyr 200 g/L EC Starane 200 EC (L4918), Tomahawk 200 EC (L6652), Voloxypr 200 EC (7776)	25ml / 10 Litres water and 0.5% Wetter & Dye	0.025	10	0.25	Closed / Dense	0.75	300
			triclopyr (butoxy ethyl ester) 240 g/L EC Ranger 240 EC adjuvant incl. (L6179) NB: add buffer for ph 5-6	100ml / 10 Litres water and 0.1% Dye	0.1	10	1	Closed / Dense	3.00	300
			triclopyr (butoxy ethyl ester) 480 g/L EC Garlon 4 EC (L3249) & 480 EC (L4916), Triclon EC (L6661), Viroaxe EC (L6663)	50ml / 10 Litres water and 0.5% Wetter & Dye	0.05	10	0.5	Closed / Dense	1.50	300
	Mature/Adult	Fell	None							
Cut stump / Frill NB: for trial, not registered		triclopyr (-amine salt) 360 g/L SL Lumberjack 360 SL (L7295), Timbrel 360 SL (L4917)	300ml / 10 Litres Water and 0.5% Wetter & Dye	0.3	10	3	Closed / Dense	6.00	200	
Pine	All	Cut down low	None							
		Ring bark	None							
Stink bean (Paraserianthes lophantha)	Seedlings	Hand pull	None							
	Adult	Foliar	clopyralid / triclopyr (-amine salt) 90 / 270 g/L SL Confront 360 SL (L7314)	30ml / 10 Litres water and 0.5% Wetter & Dye	0.03	10	0.3	Closed / Dense	0.90	300
		Cut stump / frill NB: for trial, not registered	triclopyr (-amine salt) 360 g/L SL Lumberjack 360 SL (L7295), Timbrel 360 SL (L4917)	300ml / 10 Litres Water and 0.5% Wetter & Dye	0.3	10	3	Closed / Dense	6.00	200

12. SPECIES PLANTING LIST

A Botanical specialist should be consulted for a comprehensive list in this regard.

12.1. Important Taxa of Garden Route Shale Fynbos

Growth form	Species
Tall shrubs	<i>Leucadendron eucalyptifolium</i> (d), <i>Protea aurea</i> subsp. <i>aurea</i> (d), <i>P. coronata</i> (d), <i>Leucospermum formosum</i> , <i>Metalasia densa</i> , <i>Passerina corymbosa</i> , <i>Protea neriifolia</i> , <i>Rhus lucida</i> ^T
Low shrubs	<i>Acmadenia alternifolia</i> , <i>A. tetragona</i> , <i>Anthospermum aethiopicum</i> , <i>Cliffortia ruscifolia</i> , <i>Elytropappus rhinocerotis</i> , <i>Erica hispidula</i> , <i>Helichrysum cymosum</i> , <i>Leucadendron salignum</i> , <i>Pelargonium cordifolium</i> , <i>Phylica axillaris</i> , <i>P. pinea</i> , <i>Psoralea monophylla</i> , <i>Selago corymbosa</i> .
Herbs	<i>Helichrysum felinum</i>
Geophytic herb	<i>Pteridium aquilinum</i> (d), <i>Eriospermum vermiforme</i>
Succulent herb	<i>Crassula orbicularis</i>
Herbaceous succulent climber	<i>Crassula roggeveldii</i>
Graminoid	<i>Ischyrolepis sieberi</i> (d), <i>Aristida junciformis</i> subsp. <i>galpinii</i> , <i>Brachiaria serrata</i> , <i>Cymbopogon marginatus</i> , <i>Elegia juncea</i> , <i>Eragrostis capensis</i> , <i>Ischyrolepis gaudichaudiana</i> , <i>Restio triticeus</i> , <i>Themeda triandra</i> , <i>Tristachya leucothrix</i> .

12.2. Plant species recorded on site

A total of 69 plant species were recorded on site within the proposed development footprint and along the margins of the forest (Plant, Animal & Terrestrial Biodiversity Assessment), of which three are declared weeds and/or alien invader plants, three are naturalized exotic species, and the remainder are indigenous species, some of which are weedy species commonly found in disturbed places or are species that commonly colonise areas of disturbance.

The indigenous species are as follows:

- *Abutilon sonneratianum*
- *Anemia cafferorum*
- *Arctotheca prostrata*
- *Asparagus asparagoides*
- *Brunsvigia orientalis*
- *Buddleja saligna*
- *Capparis sepiaria*
- *Carex uhligii*

- *Carpobrotus deliciosus*
- *Cerastium glomeratum*
- *Clausena anisata*
- *Crassula multicava*
- *Cynanchum obtusifolium*
- *Dovyalis rhamnoides*
- *Euphorbia helioscopia*
- *Euryops virgineus*
- *Felicia amoena*
- *Acalypha*
- *Chenopodium*
- *Cotula*
- *Dietes bicolor*
- *Isoglossa*
- *Medicago*
- *Melolobium*
- *Moraea*
- *Grewia occidentalis*
- *Gymnosporia buxifolia*
- *Hebenstretia integrifolia*
- *Helichrysum cymosum*
- *Helichrysum petiolare*
- *Helichrysum teretifolium*
- *Lauridia tetragona*
- *Lepidium africanum*
- *Lycium ferocissimum*
- *Lysimachia arvensis*
- *Massonia depressa*
- *Mesembryanthemum aitonis*
- *Mystroxydon aethiopicum*
- *Nidorella ivifolia*
- *Osteospermum moniliferum*
- *Otholobium stachyerum*
- *Passerina corymbosa*
- *Pelargonium elongatum*
- *Podalyria myrtillifolia*
- *Polygala myrtifolia*
- *Pterocelastrus tricuspidatus*
- *Putterlickia pyracantha*
- *Rhoicissus digitata*
- *Rubia petiolaris*
- *Rubus pinnatus*
- *Rumex hypogaeus*
- *Salvia aurea*
- *Scutia myrtina*
- *Searsia crenata*
- *Searsia lucida*
- *Senecio inaequidens*

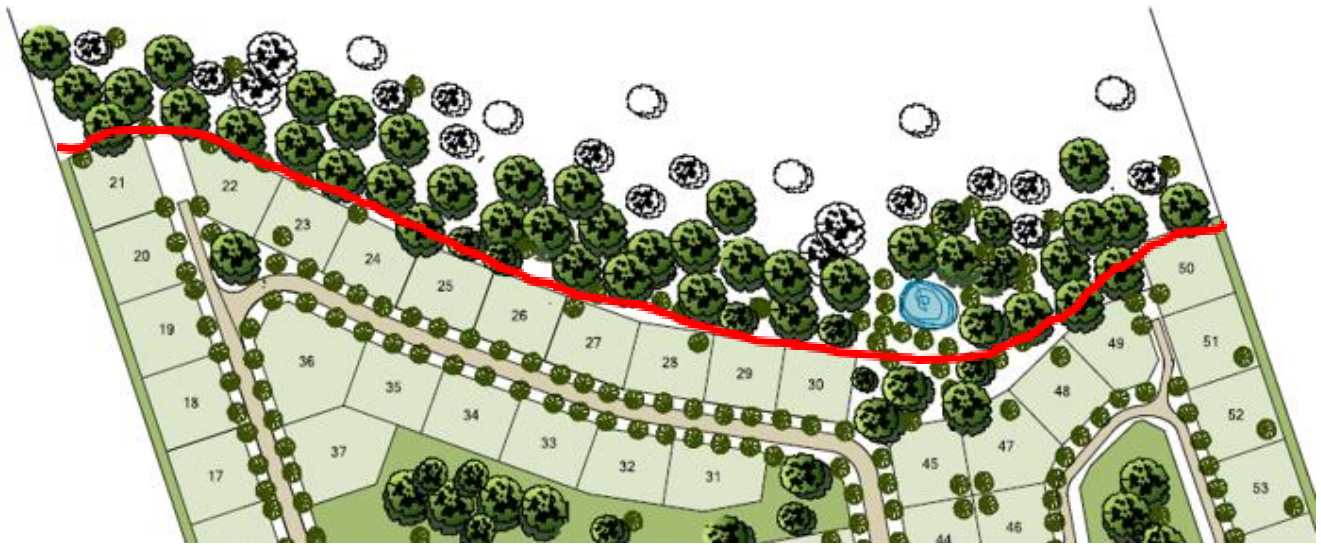
- *Sideroxylon inerme* (PROTECTED TREE)
- *Stachys aethiopica*
- *Stenotaphrum secundatum*
- *Trimeria grandifolia*

12. WILDLIFE CORRIDOR MANAGEMENT

The aim of the wildlife corridor is to maintain functional habitat on more level land with access to water for the wildlife that occur in the area. For this area to remain functional through the operational phase of the development, it would need to be managed effectively.

The recommendations for the wildlife corridor (see red line in screenshot below) would be to:

- A perimeter fence is recommended along the northern section of the property to preserve the wildlife corridor and natural area beyond. The fenceline should not extend into the 20m corridor and should aim to separate the development area from the conservation / wildlife area.
- Use clearVu fencing to separate the corridor from the development area. The spring must be incorporated into the corridor. The fence is to keep domestic animals (cats and dogs, etc) out of the wildlife corridor.
- Clear vu type fencing would have the important benefit of excluding pets (cats and dogs) from the wildlife corridor area where they could deter or kill wildlife large and small.
- No fencing should be permitted along the boundary either side of the corridor. It should be continuous to neighbouring properties to allow free animal movement.
- The fence can have a pedestrian gate or two which can be kept locked. No electric fencing should be permitted. If security is required, cameras can be used to monitor fence lines.
- Dense planting along the corridor side of the fencing should be done using plant species found on the site. This will aim to screen light and sound from the development.
- No garden waste disposal over the fence line into corridor. This must be strictly enforced by the HOA as it will smother indigenous vegetation and introduce alien / exotic species.
- No landscaping, mowing or weedeating should be permitted in the corridor. Only clearance of alien vegetation should be allowed.
- Recreational use of the corridor should be restricted to walking (no dogs) and bird-watching during daylight hours only. The gates should be locked and access restricted from dusk to dawn. No mountain biking should be permitted as this causes too much disturbance.
- Lighting within the development should be minimised as far as possible. Use motion detector lights / bollards instead of tall lights along streets. Minimise insect attraction to lights by installing yellow spectrum vs blue spectrum lights. Provide specifications to all residents for their outdoor lighting and recommend that motion sensor lights be installed instead of permanent lights through the HOA.



13. STAFF CONDUCT CONTROL AND INFORMATION SHEET

ALL STAFF MUST OBEY THE FOLLOWING RULES:	
1	DO NOT tamper with or destroy nesting sites, lairs or any other form of animal shelter.
2	DO NOT feed the native animals.
3	DO NOT leave the project site untidy and strewn with rubbish that will attract pests.
4	DO NOT bring any pets onto the project site.
5	DO NOT trespass onto private properties not linked to the project.
6	DO NOT carry a weapon onto the project site or in the vehicles transporting workers to and from the site.
7	DO NOT set fires.
8	DO NOT cause any unnecessary disturbing noise at the project site or at any designated worker collection/drop off points.
9	DO NOT drive a vehicle under the influence of alcohol.
10	DO NOT exceed the national speed limits on public roads or exceed the recommended speed limits in this management plan (where applicable)
11	DO NOT drive a vehicle that is generating excessive noise (noisy vehicles must be reported and repaired as soon as possible).
12	DO NOT litter along the roadsides, including both public and private roads.
13	DO NOT remove or destroy vegetation around the site without the prior consent of the site manager and Environmental Control Officer.
14	DO NOT tamper with, destroy or remove vegetation from any areas that have been fenced off or marked.
15	DO NOT pollute watercourses, whether flowing or not.
16	DO NOT drive through watercourses.
17	DO NOT operate critical items of mechanical equipment without having been trained and certified.
18	ALL employees must undergo the necessary safety training and wear the necessary protective clothing at all times.
19	NO unsocial behaviour will be permitted e.g., excessive shouting, hooting etc.
20	NO ad-hoc activities are to be undertaken e.g. fires for cooking, the use of surrounding bush as a toilet facility is strictly forbidden
21	NO trespassing on private / commercial properties adjoining the site is forbidden.
22	NO worker may be forced to do work that is potentially dangerous or for what he / she is not trained to do.

14. RESPONSIBILITIES

The “Responsibility” column is merely a guide and does not relieve the Applicant of his responsibilities in terms of overall compliance with the EA and EMPr.

FUNCTION	RESPONSIBILITY
Applicant	<ul style="list-style-type: none"> The Applicant is ultimately responsible for the ensuring compliance with all the requirements associated with the construction, operation, rehabilitation and decommissioning phases of the project.
Site Manager / Contractor	<ul style="list-style-type: none"> The Site Manager is responsible to ensure that all necessary communication and submission of required documentation concerning this project is submitted to the relevant authorities. The site manager is required to adhere to the EMPr and is responsible to ensure that all staff appointed also adhere the EMPr. Ensures that all staff are made aware of the need to conduct activities in an environmentally responsible manner. (Site Manager) On instruction by the ECO, ensures that storm/surface water controls are established. Ensures prompt remediation of any sewage spills. Stockpiles are protected from aeolian effects, stormwater effects, or being driven over by workers. Ensures that a “clean-site” policy is applicable at all times. Ensures that all complaints by residents are dealt with promptly. Is responsible for any contravention/s by staff or any non-compliance with the EMPr.
Environmental Control Officer (ECO)	<ul style="list-style-type: none"> The ECO is to have access to the site at all times, for the purpose of inspections to ensure that the environmental conditions of the EMPr as well as the conditions stipulated to in the EA and the recommendations made in the EIR are being implemented and adhered to. The ECO must report on the environmental aspects of the project to the responsible person/authority at agreed intervals. The need for any deviations or variations in the environmental conditions must be reported to the DEDEAT for approval prior to these being undertaken. The ECO must be fully cognisant with the contents of the Environmental Authorisation as well as this EMPr and any other applicable legislation
Competent Authority	<ul style="list-style-type: none"> The Compliance Officer appointed by the Competent Authority is responsible for the ensuring that the Applicant, Site Manager and ECO are compliant with the provisions of the EA and EMPr.

ACKNOWLEDGEMENT FORM

Record of signatures providing acknowledgment of being aware of and committed to complying with the contents of this Environmental Management Programme (EMPr), which relates to the environmental mitigation measures for the project outlined below, and the environmental conditions contained in all other contract documents.

PROJECT NAME:

Proposed Residential Development on Portion 91 of Farm Matjes Fontein 304, Keurboomstrand, Plettenberg Bay, Western Cape Province.

DEA&DP REF: 16/3/3/6/7/1/D1/13/0268/22

APPLICANT:

Signed: Date:

SITE MANAGER / CONTRACTOR:

Signed: Date:

ENVIRONMENTAL CONTROL OFFICER

Signed: Date:

Annexure A: CV of the EAP

Joclyn Marshall

(EAPASA Reg. 2022/5006)

Location: Sedgefield, Western Cape, 6576

Contact: 072 126 6393

Email: joclynjoe@gmail.com

Citizenship: South Africa

DOB: 09 May 1986



CAREER HISTORY

July 2022 – current	Eco Route Environmental Consultancy <i>Environmental Assessment Practitioner</i>
<ul style="list-style-type: none">• Environmental screening for new projects (DFFE Screening Tool, mapping, site assessments, review of applicable legislation, etc).• Compile Basic Assessment Report and EIA's (NOI, NID, Application, DBAR, EMP, FBAR, etc).• Compile EMP's, MMP's, screening reports, rehabilitation plans, AIS Control Plans, and any other reports required.• Part 1 and 2 Amendments applications.• Liaise with clients, specialists, and competent authorities.• Complete EIA Checklists.• OSCAER permit and EMMS compilations and submission.• Environmental audits and ECO duties.• S24G Rectification Applications.• Prepare Public Participation documents and registers.• Compiling quotations, tender documents and RFQ's	
August 2020 – August 2022	Moira Cloete Environmental Assessment Practitioner <i>Sub-Consultant</i>
<ul style="list-style-type: none">• Perform tasks and functions as set out in the EIA Regulations 2014, as amended, specifically in line with Appendices 1-4 thereof.• Complete environmental screening tool reports.• Complete EIA/BAR application forms.• Draft Scoping Reports.• Draft EIAs/BARs.• Prepare Public Participation documents, EMPs and BID documents.• Completed Projects:<ul style="list-style-type: none">✓ EIA for proposed construction of a water storage dam on Argyll Farm 218 for irrigation of 80ha of lucerne, Indwe, Eastern Cape.✓ EIA for proposed construction of a water storage dam on Coldstream Farm 970 for irrigation of 80ha of lucerne, Indwe, Eastern Cape.✓ BAR for proposed development of a poultry facility for egg production on Confluence Farm 143, Maclear, Eastern Cape.✓ EMP for operating an organic composting facility for Meat Traders Abattoir, Komani, Eastern Cape.	
February 2012 – April 2019	Knysna Municipality <i>Senior Environmental Officer</i>
<ul style="list-style-type: none">• Preparation of EMP's, MEMP's, EMM's for municipality and clients.• Carrying out ECO work on municipal projects and other construction sites.	

- Commenting on Land Use applications, EIA applications and issuing of OSCAER permit.
- Conducting various site inspections and audits including taking water samples for analysis.
- Applying environmental legislation and regulations to applications and other environmental matters.
- Liaising with other Governmental Departments, NGO's, Forums, Committees and Conservancies.
- Campaigning in environmental education and development of educational programmes.
- Report writing, research and project development.
- Advising and assisting public on environmental matters and various related tasks.

February 2011 – January 2012 Allanson Associates cc.

Research assistant at the Knysna Basin Project

- Field work that included water sample collection and analysis, critical observations of environmental health, monitoring of Wastewater Treatment Works outflow;
- Lab work that included water quality analysis (including chemical methodology), fluorometry, microscopy and scientific report writing and publication.

June - July 2010

Department of Environmental Science, Rhodes University

Field assistant

- Harvesting, transporting, shredding and drying spekboom material.

2009 – 2010

Department of Environmental Science, Rhodes University

Graduate Assistance

- Assisted in second year practicals and field trips, and data input.

2007

Departments of Zoology and Botany, Rhodes University

Demonstrator

- Assisted in first year practicals and field trips, and marking practical reports.

ACADEMIC QUALIFICATIONS

2009 – 2010

Masters in Environmental Science by research dissertation
Rhodes University

Thesis: Population assessments of priority plant species used by local communities in and around four Wild Coast Reserves, Eastern Cape, South Africa

2008

Honours in Biodiversity and Conservation (*Joint Botany and Environmental Science*)
Rhodes University

2005 -2007

Bachelor of Science with Majors in Botany and Zoology
Rhodes University

1998 – 2004

Heatherhill College (Cambridge University International Examination)

HIGCSE: Art and Design (2), First Language English (3), Biology (1), Mathematics (2), Physical Science (2), Afrikaans as a Second Language (3). IGCSE: Information Technology (B)

PUBLICATIONS

- B.R. Allanson & J.J. Fearon (2012): Growth rate of juvenile *Siphonaria compressa* (Gastropoda: Pulmonata), Invertebrate Reproduction & Development, DOI:10.1080/07924259.2011.646447

OTHER SKILLS AND TRAINING

- Registered with the Environmental Assessment Practitioners Association of South Africa (EAPASA) – Registration number 2022/5006
- Registered as a Candidate Natural Scientist in Environmental Science. Registration number: 100121/11
- SAGIC Invasive Species Training, 15-18 May 2018. Stellenbosch, Western Cape.
- Certificate of competence in Herbicide Applicator – Noxious Weeds, 18 May 2018. Invader Plant Specialists (Pty) Ltd. Stellenbosch, Western Cape.
- Certificate attained for Management of Estuaries in South Africa short learning programme. NMMU, Stellenbosch, Western Cape.
- Certificate attained for Urban Interface Fire Management Short Course, 10-12 November 2015. NMMU Saasveld.
- Certificate of attendance attained for ArGIS Basic Training, 4 May – 8 May 2015. ESRI South Africa.
- Certificate attained for Basic Training Course for Environmental Management Inspector, 17 November 2014 - 15 December 2014. Western Cape Department of Environmental Affairs and Development Planning.
- Certificate attained for Fire Ecology and Conservation Short Course, 14-18 July 2014. NMMU Saasveld.
- Certificate attained for EIA Short Course, 13-17 May 2013. Rhodes University.
- Computer literacy: Microsoft Office including Word, Excel, Powerpoint, Access and Publisher.
- Drivers license code 08.

REFERENCES ARE AVAILABLE ON REQUEST

Annexure B: TRAINING REGISTER

[illegible]

Annexure C: INCEDENCE REPORTING

INCIDENT REPORT FORM		Date:	
PROJECT NAME:			
To be completed by the person reporting the incident:			
Name		Designation	
Contact number		Physical location of incident	
Describe the incident and environmental impact			
What remediation has been undertaken? (describe)			
In the opinion of the Site Operations Manager is the remediation action sufficient?			
If not, what further actions must be taken? (detail)			
Has the damage/ contamination been completely remediated?			
If not, what residual damage remains (detail the residual damage)?			
If residual damage remains - what is the reason and what is planned with respect to the environmental damage?			
Upon investigation, what was found to be the cause of the incident? (Detail)			
Is this a repeat of a similar incident?			
What is the reason that planned changes did not prevent a recurrence of the incident?			
What is to be changed to ensure that the incident will not be repeated? (Detail)			
Does the incident potentially compromise legislation?			

3

³ Ecosense CC

Note: In the event of a significant incident which is defined in terms of section 30(1)(a) of the National Environmental Management Act as an unexpected sudden occurrence, including a major emission, fire or explosion leading to danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed, the incident shall be reported. In line with Section 30(3)(d) any steps that should be taken in order to avoid or minimise the effects of the incident on public health and the environment must be reported to-

- (i) the Director-General of the Department responsible for Environmental and / or Water Affairs;
- (ii) the South African Police Services and the relevant fire prevention service;
- (iii) the relevant provincial head of department or municipality; and
- (iv) all persons whose health may be affected by the incident

Other Comments:

Date

Signed by person completing the report.

⁴ Ecosense CC

Annexure D: COMPLAINTS REGISTER

ENVIRONMENTAL COMPLAINTS REGISTER		Date:	
PROJECT NAME			
RESPONSIBLE PERSON:		Phone number	
Company		E-mail	

Date of complaint	Contact Details of Complainant	Nature of Complaint	Actions taken to rectify including dates

5

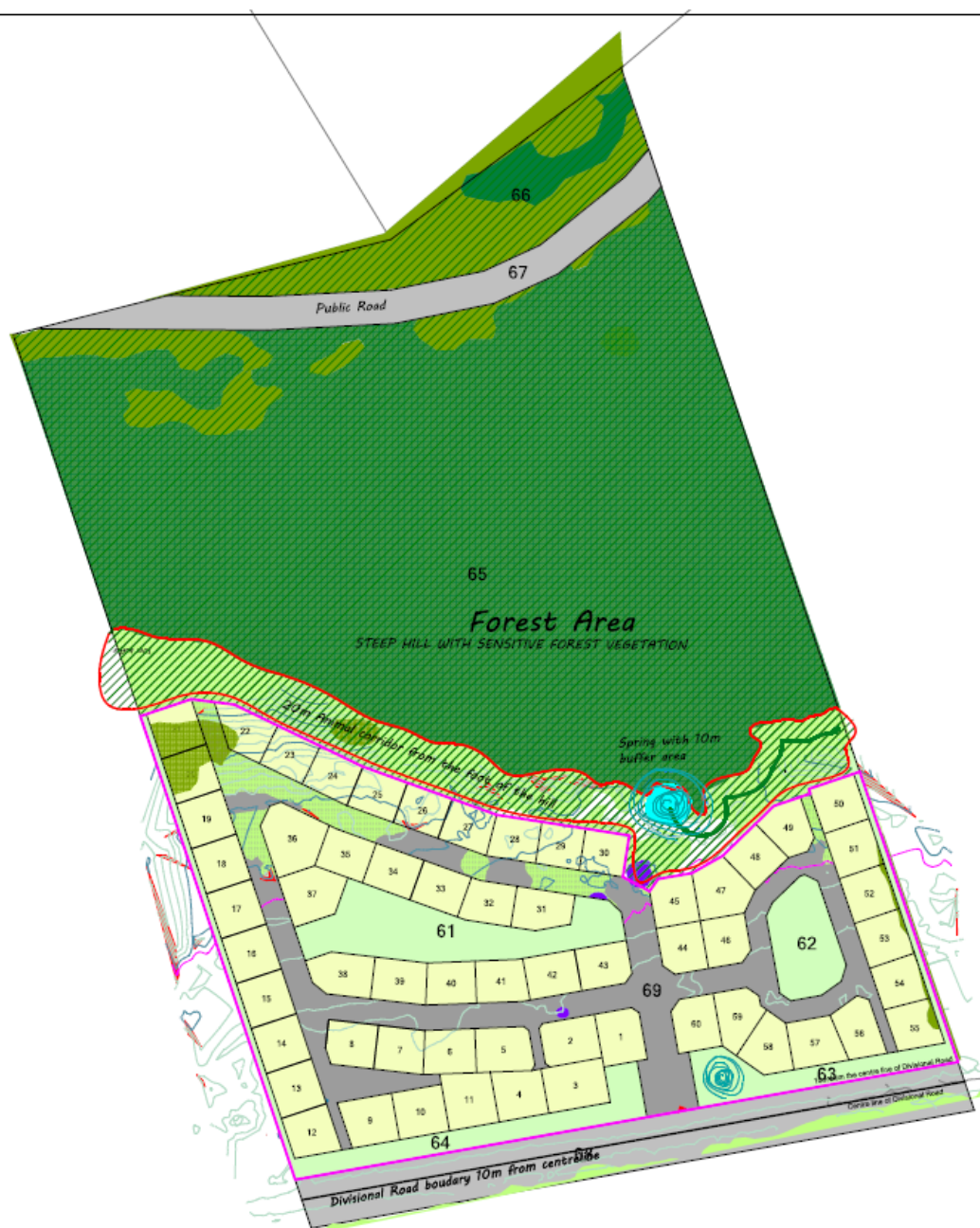
⁵ Ecosense CC

Annexure E: SDP



SCALE 1:2250 A3

DIAGRAM 10



	Sensitive Forest Vegetation
	20m Corridor
	Secondary Vegetation
	Mikwoods
	Fountain with 10m buffer

Single Residential I		OPEN SPACE II	
ERF NUMBER	SQUARE METRES	ERF NUMBER	SQUARE METRES
1	530	61	3360
2	564	62	1564
3	638	63	2072
4	540	64	2646
5	557		
6	517	OPEN SPACE III	
7	482		
8	487	ERF NUMBER	SQUARE METRES
9	552	65	76730
10	542	66	6782
11	617		
12	487	TRANSPORT ZONE II	
13	506		
14	506	ERF NUMBER	SQUARE METRES
15	506	67	4534
16	506	68	6662
17	506		
18	506	TRANSPORT ZONE III	
19	506		
20	506	ERF NUMBER	SQUARE METRES
21	506	69	11978
22	493		
23	450		
24	460		
25	460		
26	450		
27	469		
28	456		
29	421		
30	420		
31	504		
32	471		
33	480		
34	480		
35	481		
36	763		
37	634		
38	563		
39	515		
40	469		
41	481		
42	500		
43	492		
44	477		
45	477		
46	476		
47	611		
48	495		
49	481		
50	506		
51	506		
52	506		
53	506		
54	506		
55	487		
56	514		
57	539		
58	516		
59	513		
60	527		

Annexure F: Environmental Sensitivities

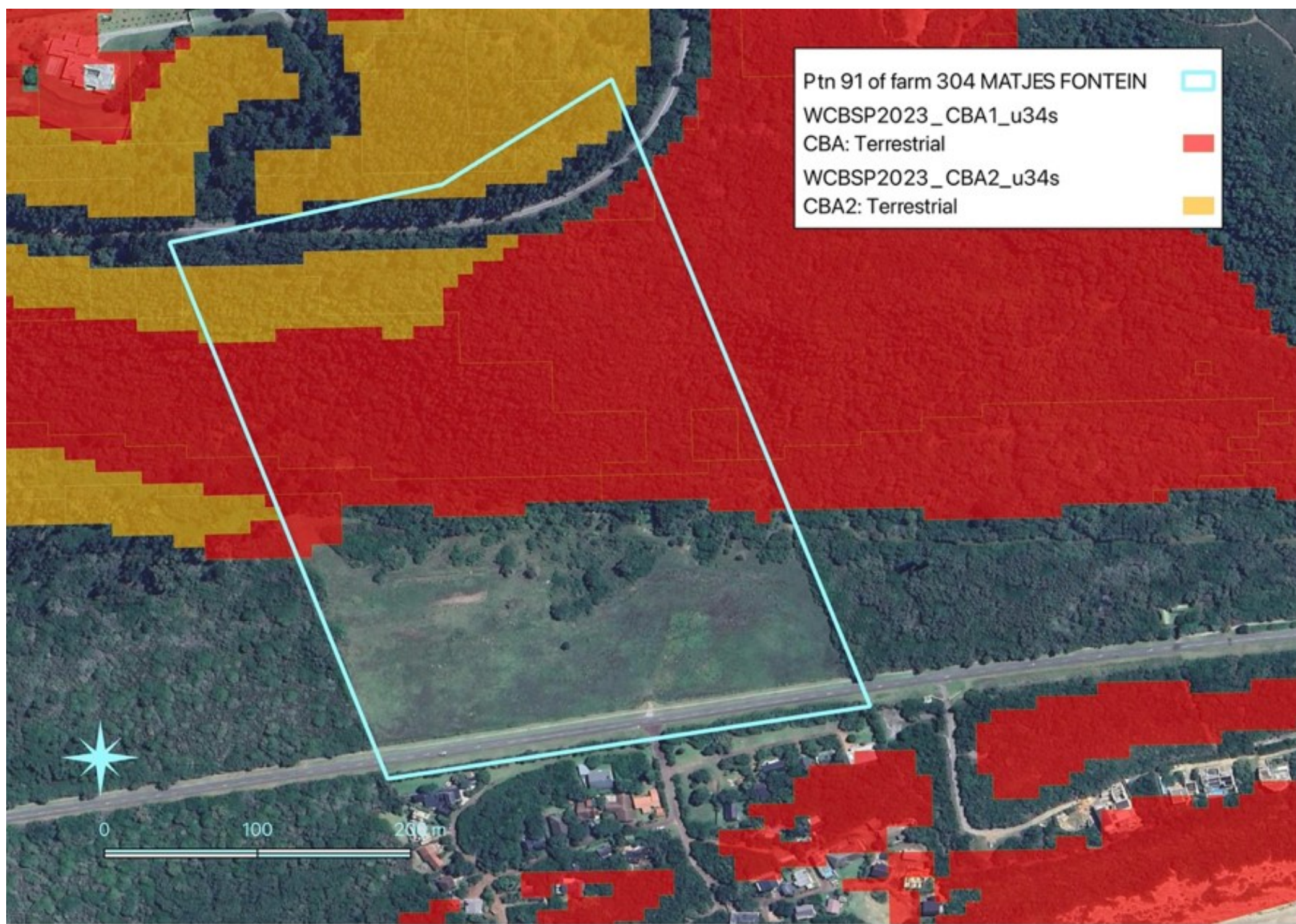


Figure 12: Western Cape Biodiversity Spatial Plan of the site and surrounding areas.

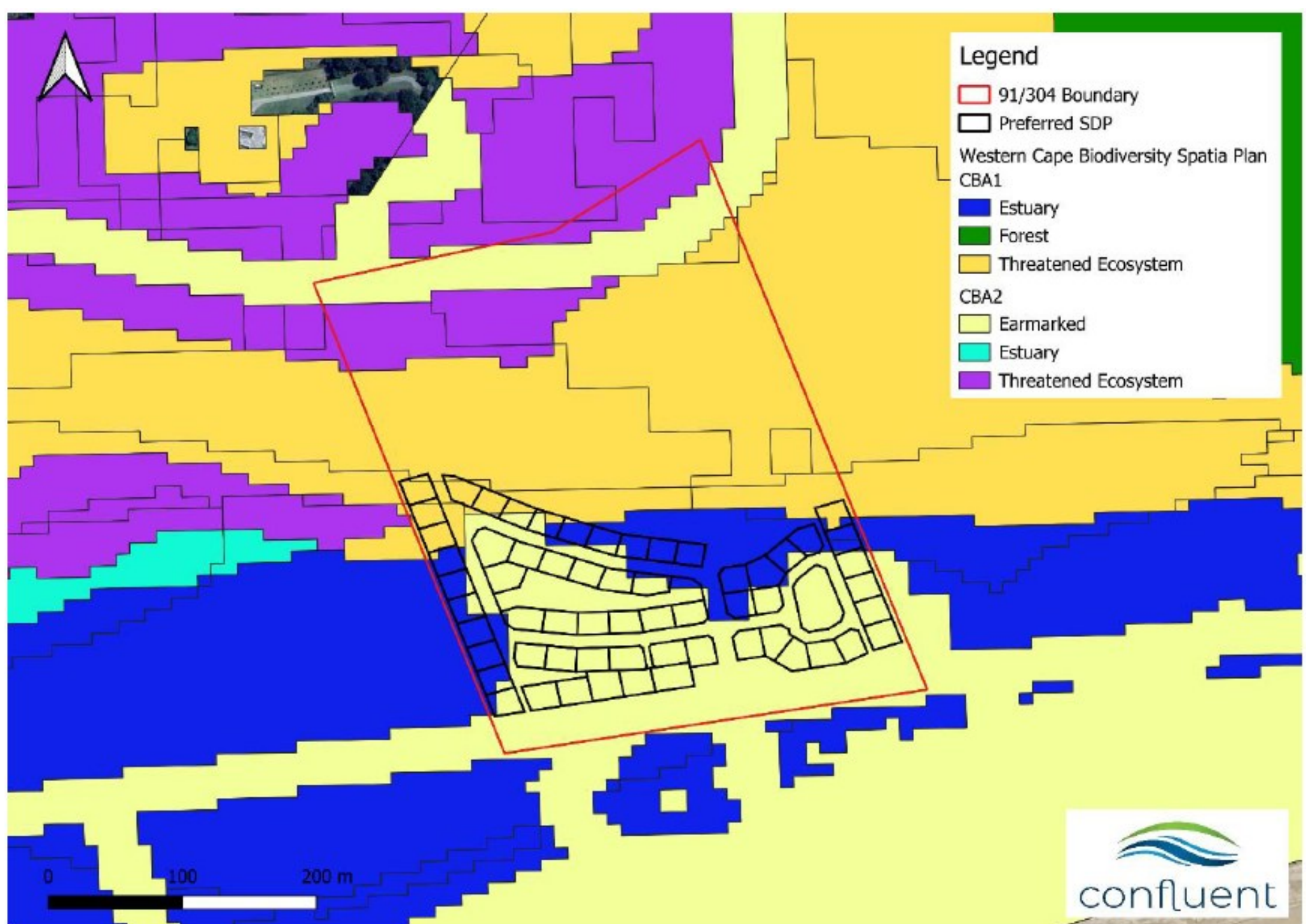


Figure 6. Critical Biodiversity Areas indicated in the Western Cape Biodiversity Spatial Plan (2024).

Conservation: 2023 WC Biodiversity Spatial Plan



Legend

- Farm Portions
- Erf

Critical Biodiversity Areas (Degraded)

- CBA2: Aquatic
- CBA2: Terrestrial

Critical Biodiversity Areas

- CBA: Estuary
- CBA: Forest
- CBA: Terrestrial

Map Center: Lon: 23°26'9.9"E
Lat: 34°0'15.5"S

Scale: 1:4,500

Date created: 2025/09/06



**Western Cape
Government**
FOR YOU

CapeNature (2024). 2023 Western Cape Biodiversity Spatial Plan and Guidelines. Biodiversity Capabilities. CapeNature. Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community. Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community




Vegetation Type (Vegmap 2018)



Legend

- ☐ Farm Portions
☐ Erf

VEGMAP 2018

-  AT 36 Goukamma Dune Thicket
 AZd 3 Cape Seashore Vegetation
 FFh 9 Garden Route Shale Fynbos
 FOz 1 Southern Afrotemperate Forest

Map Center: Lon: 23°26'9.9"E
Lat: 34°0'15.5"S

Scale: 1:4,500

Date created: 2025/09/06



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SANBI Red List of Ecosystems: Original



Legend

Farm Portions

Erf

Red List of Ecosystems Original

Category

Endangered

Least Concern

Map Center: Lon: 23°26'9.9"E
Lat: 34°0'15.5"S

Scale: 1:4,500

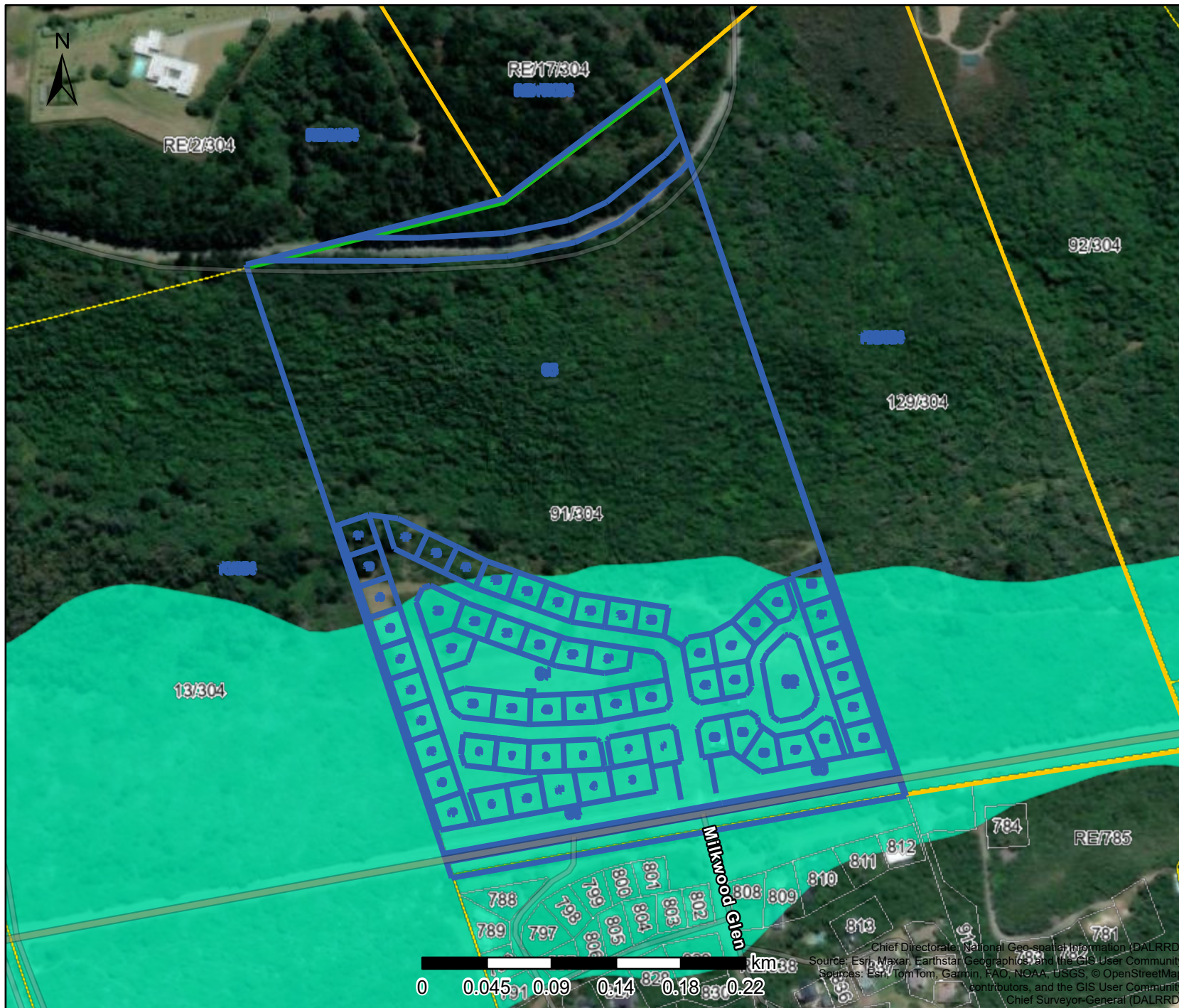
Date created: 2025/09/06



**Western Cape
Government**
FOR YOU

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
Chief Surveyor-General (DALRRD)
South African National Biodiversity Institute

Wetlands and Watercourses



Legend

Farm Portions

Erf

Wetlands (NWM5)

Classification

Estuarine functional zone

Wetlands (NFEPA)

Estuaries

Map Center: Lon: 23°26'9.9"E
Lat: 34°0'15.5"S

Scale: 1:4,500

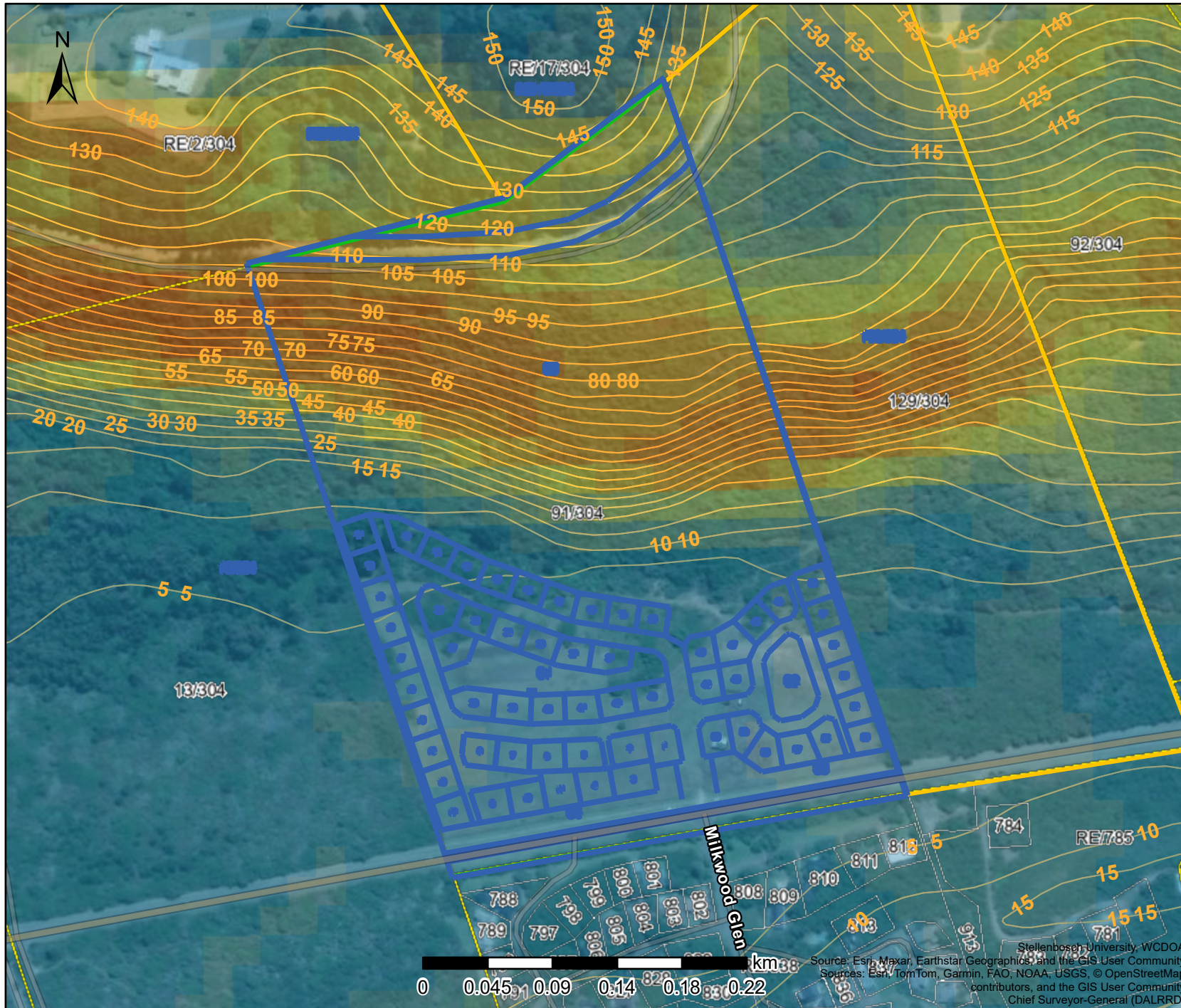
Date created: 2025/09/06



**Western Cape
Government**
FOR YOU

Chief Directorate: National Geo-spatial Information (DALRRD)
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
Chief Surveyor-General (DALRRD)

Slope and Contours



Legend

Farm Portions

Erf

Slope Percentage

%

- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- 21 - 25
- 26 - 30
- 31 - 35
- 36 - 40
- 41 - 45
- 46 - 50
- 51 - 60
- 61 - 70
- 71 - 80

5m Contours

Map Center: Lon: 23°26'9.9"E
Lat: 34°0'15.5"S

Scale: 1:4,500

Date created: 2025/09/06



**Western Cape
Government**
FOR YOU

Stellenbosch University, WCDOA
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap
contributors, and the GIS User Community
Chief Surveyor-General (DALRRD)



Legend

Farm Portions
 Erf

Habitats

Alien trees
 Forest
 Lawns / pasture
 Milkwoods
 Roads
 Secondary vegetation

Map Center: Lon: 23°26'7.7"E
Lat: 34°0'14.8"S

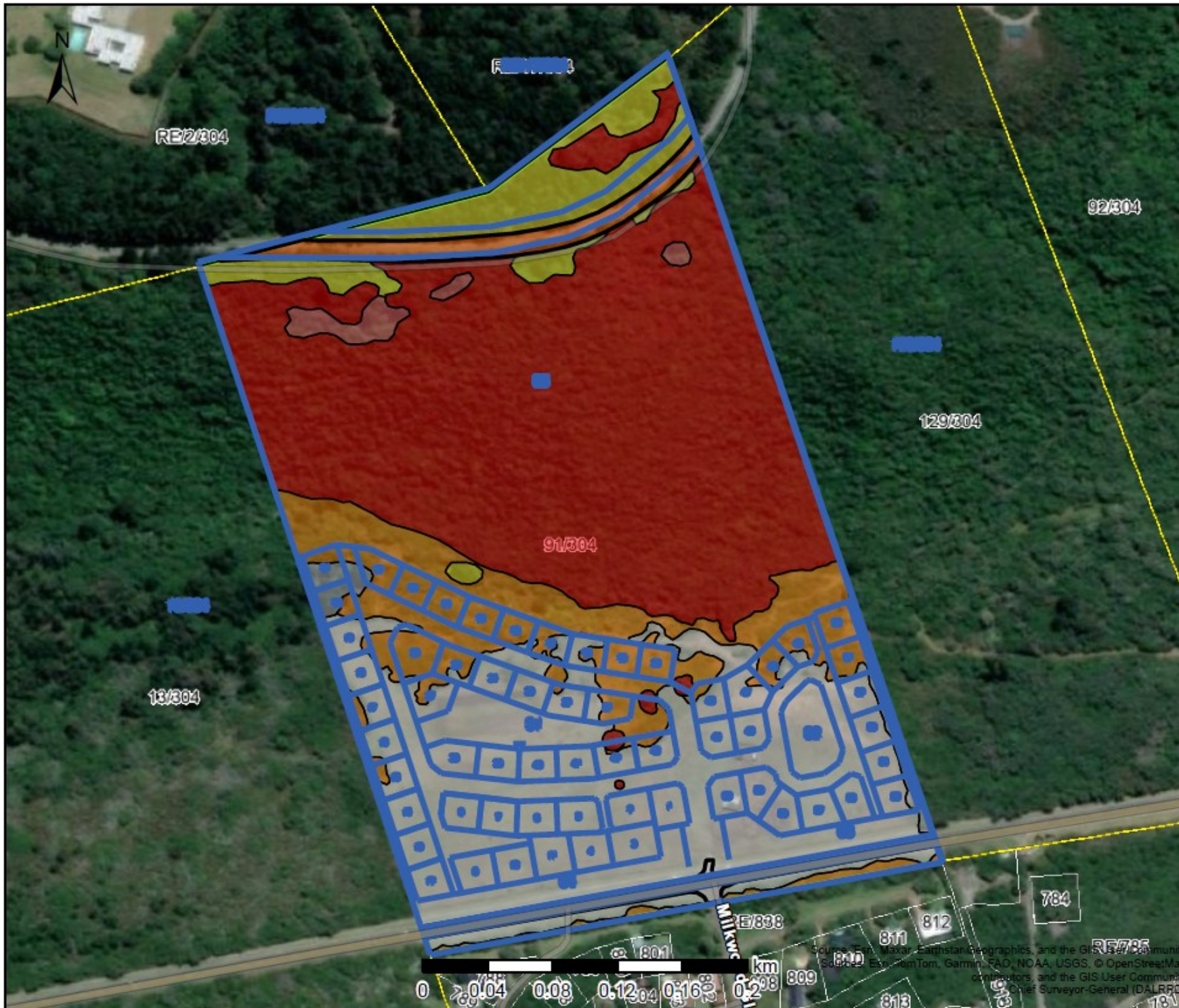
Scale: 1:4,000

Date created: 2025/09/06



**Western Cape
Government**
FOR YOU

Map of habitats on site (Plants, Animals & Terrestrial Biodiversity Assessment by David Hoare Consulting).



Legend

Farm Portions
 Erf

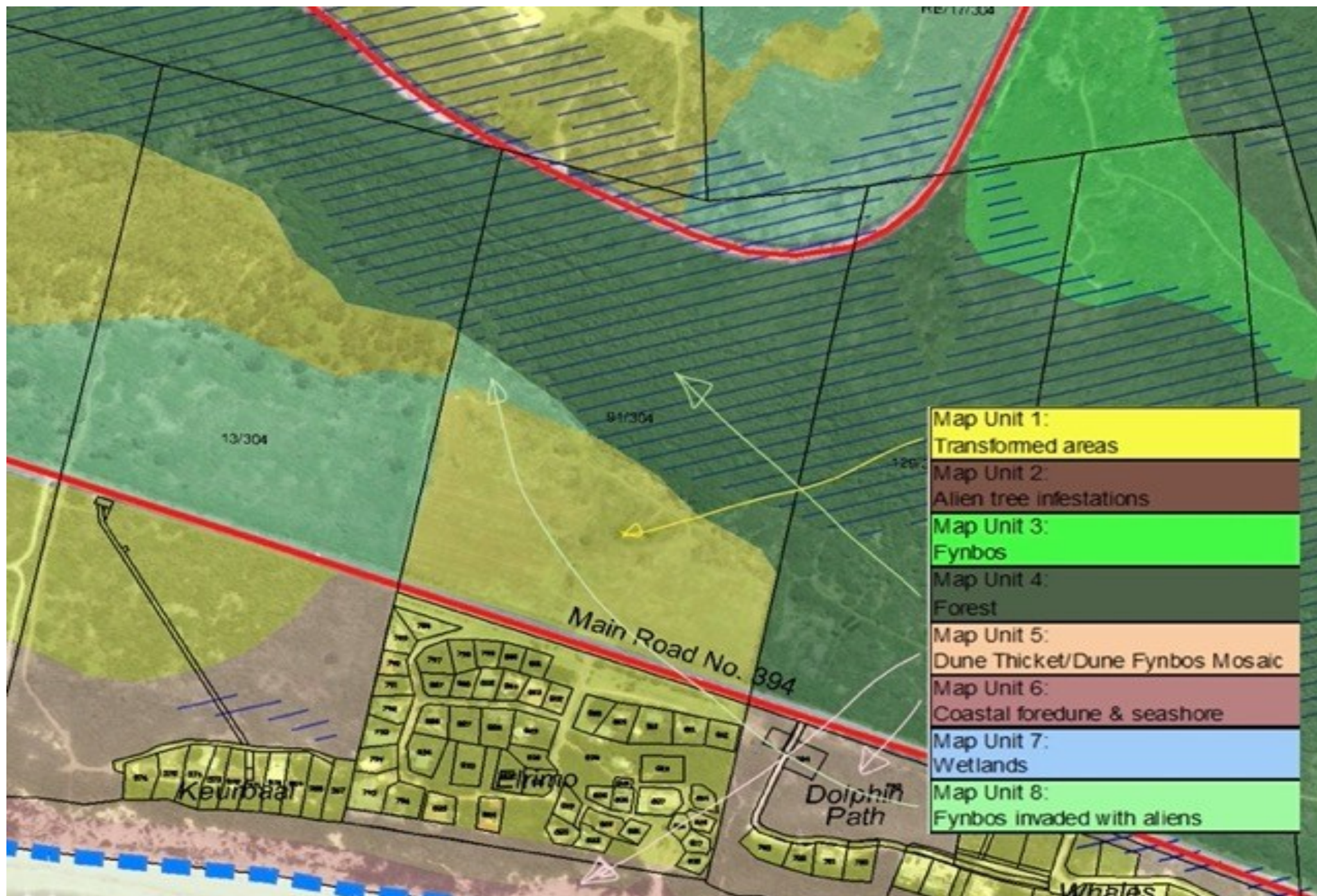
Habitats

VERY HIGH
 HIGH
 MEDIUM
 LOW
 VERY LOW

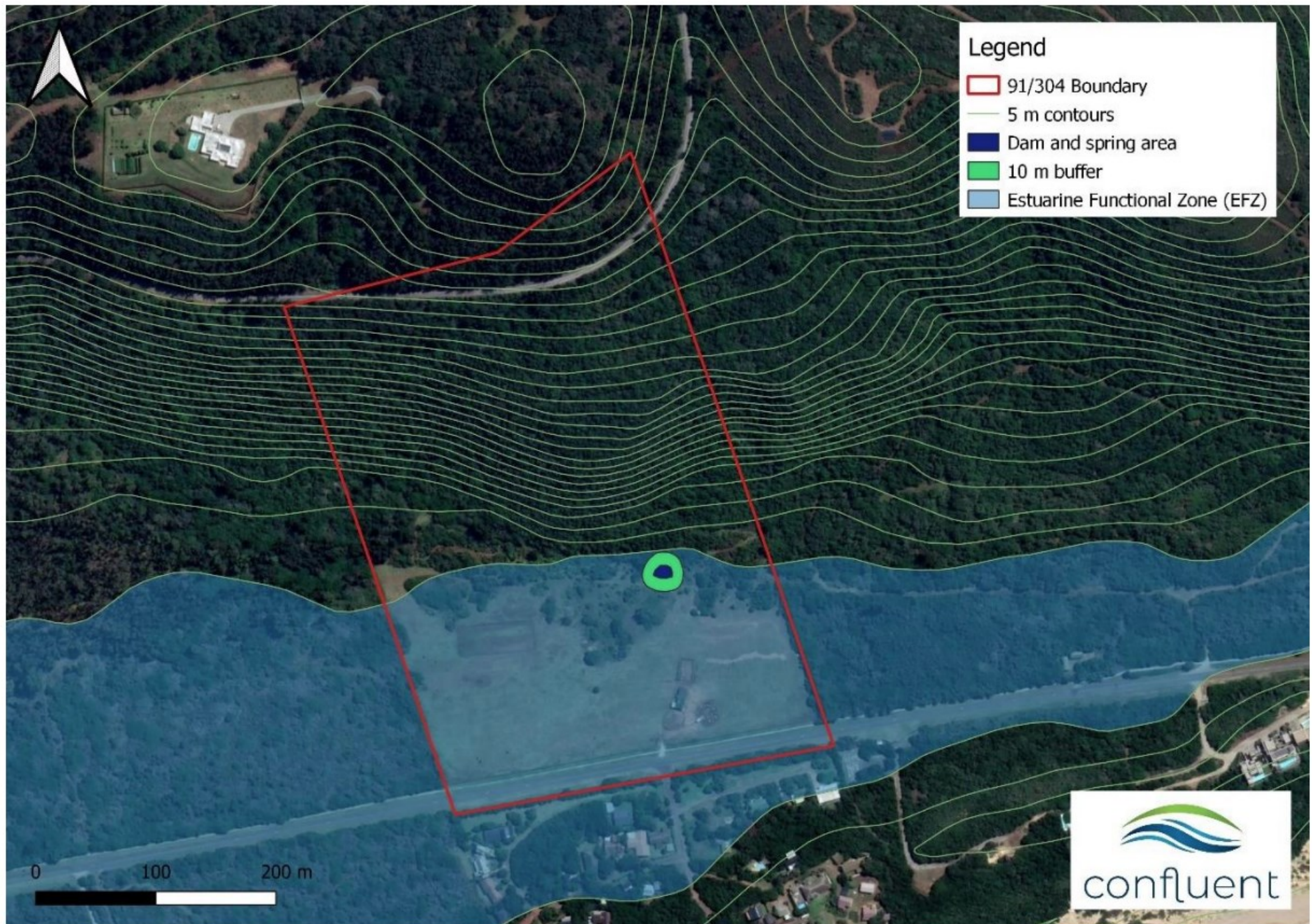
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Scale: 1:4,000
Date created: 2025/09/06

Western Cape Government
 FOR YOU

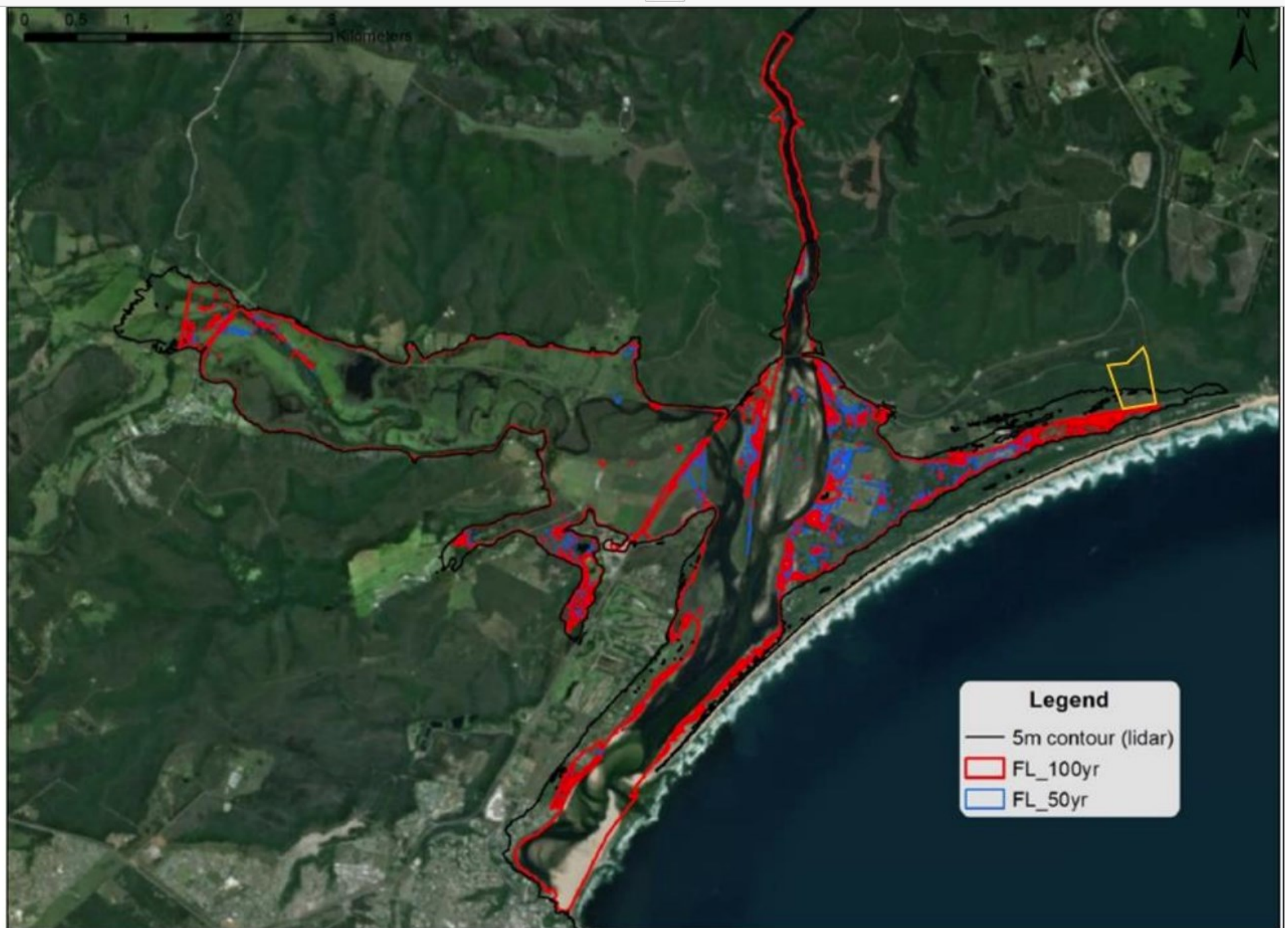
Habitat sensitivity on site (Plants, Animals & Terrestrial Biodiversity Assessment by David Hoare Consulting).



Habitat Units from KELASP (Plants, Animals and Terrestrial Biodiversity Report by David Hoare Consulting (Pty) Ltd, dated 16 March 2023).



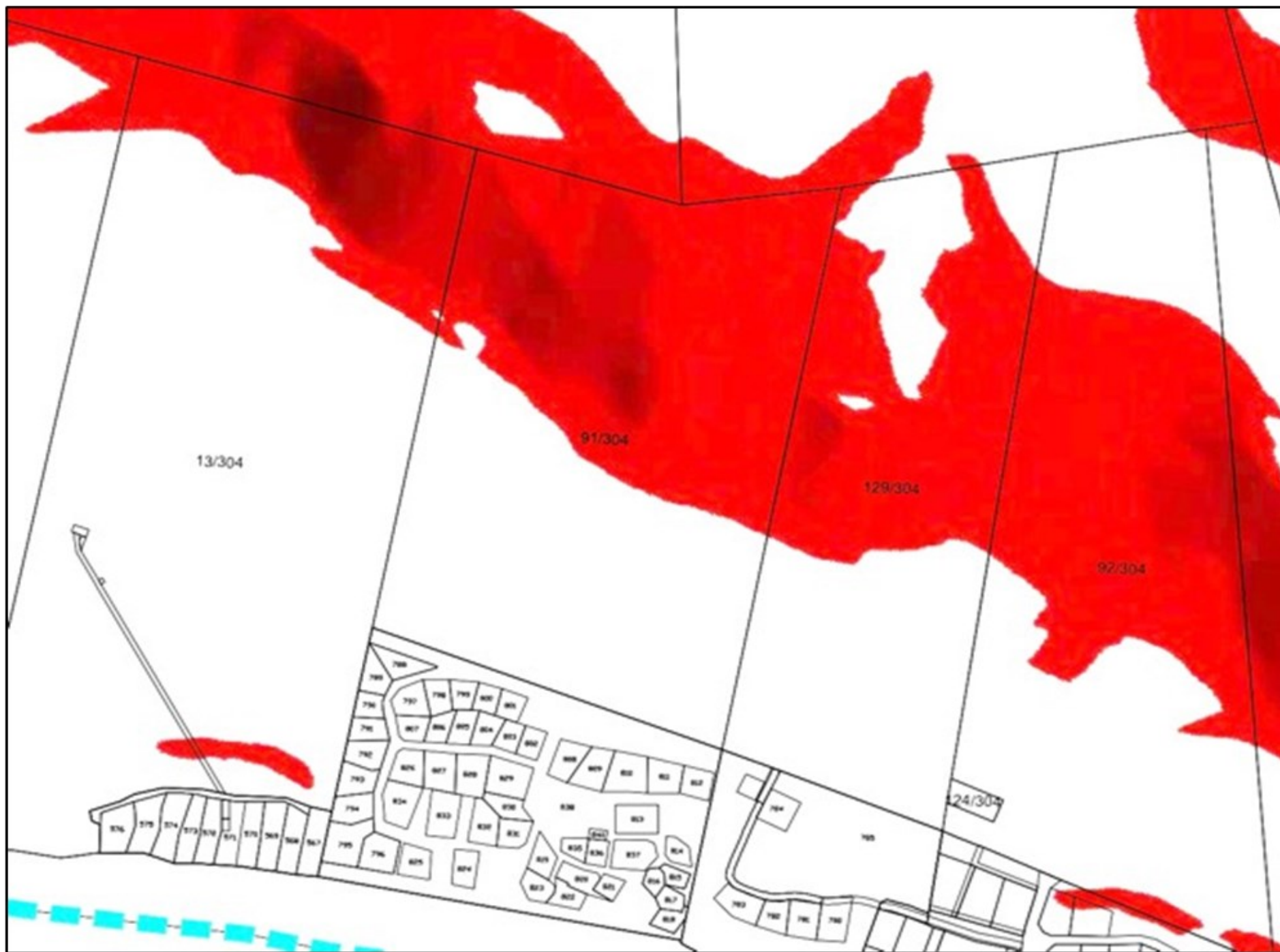
Location of the small, excavated dam and spring along with the mapped 10 m buffer.



Mapped floodlines according to the Keurbooms-Bitou Estuary Management Plan indicating the proposed development site.



Floodlines and wetlands from KELASP (Plants, Animals and Terrestrial Biodiversity Report by David Hoare Consulting (Pty) Ltd, dated 16 March 2023).



Slope Analysis from KELASP - slopes steeper than 1:4