



# ECO ROUTE ENVIRONMENTAL CONSULTANCY

## DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

### PROPOSED RESIDENTIAL DEVELOPMENT AND ASSOCIATED INFRASTRUCTURE ON A PORTION OF RE/155, KEURBOOMSTRAND, PLETTENBERG BAY



Pre-application reference: 16/3/3/6/7/1/D1/6/0126/20

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Appendix 4 of Regulation 982 of the 2014 EIA Regulations contains the required contents of an Environmental Management Programme (EMPr). The checklist below serves as a summary of these requirements:

<p>(a) Details of</p> <p>(i) the EAP who prepared the EMPr; and</p> <p>(ii) The expertise of that EAP to prepare an EMPr, including a curriculum vitae.</p>	<p>This EMPr was prepared by Samantha Teeluckdhari of Eco Route Environmental Consultancy. Samantha has a BSS Geography and Environmental Management degree and has 7 years' experience as an Environmental Assessment Practitioner, of which she has spent 5 years at Eco Route. Samantha is currently based at Eco Route's Durban office. Please see attached CV of the EAP.</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>This EMPr covers all aspects involved in the Proposed Residential Development and Associated Infrastructure on a Portion of RE/155, Keurboomstrand, Plettenberg Bay</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>Section 2 provides GIS mapping which superimpose the proposed activity onto environmentally sensitive areas.</p>
<p>(d) A description of the impact management objectives, 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 the phases of the development including –</p> <p>(i) Planning and design;</p> <p>(ii) Pre-construction activities;</p> <p>(iii) Construction activities;</p> <p>(iv) Rehabilitation of the environment after construction and where applicable post closure; and</p> <p>(v) Where relevant, operation activities</p>	<p>Addressed in Sections 3 and 9.</p>
<p>(e) A description and identification of impact management outcomes required for the aspects contemplated above.</p>	<p>Addressed throughout the EMPr, specifically in Sections 3 and 9.</p>
<p>(f) A description of the proposed impact management actions, identifying the manner in</p>	<p>Addressed throughout the EMPr, specifically in Sections 4 and 9.</p>

<p>which the impact management objectives and outcomes contemplated above will be achieved and must, where applicable include actions to –</p> <p>(i) Avoid, modify, remedy control or stop any action, activity or process which causes pollution or environmental degradation;</p> <p>(ii) Comply with any prescribed environmental management standards or practises;</p> <p>(iii) Comply with any applicable provisions of the Act regarding closure, where applicable; and (iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable.</p>	
<p>(g) The method of monitoring the implantation of the impact management actions contemplated above.</p>	Section 6.
<p>(h) The frequency of monitoring the implementation of the impact management actions contemplated above.</p>	Section 6.
<p>(i) An indication of the persons who will be responsible for the implementation of the impact management actions.</p>	Sections 6, 8, 9 and 13.
<p>(j) The time periods within which the impact management actions must be implemented.</p>	Section 9.
<p>(k) The mechanism for monitoring compliance with the impact management actions.</p>	Sections 5 and 6.
<p>(l) A program for reporting on compliance, taking into account the requirements as prescribed in the Regulations.</p>	Section 6.
<p>(m) An environmental awareness plan describing the manner in which –</p> <p>(i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and</p> <p>(ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment</p>	Sections 8 and 9.
<p>(n) Any specific information that may be required by the competent authority.</p>	All required information has been addressed within this EMP and annexures.



## 1. INTRODUCTION

In accordance with the Integrated Environmental Management Guidelines published by the Department of Environmental Affairs & Tourism (DEAT) 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”.

National Environmental Management Act, (Act 107 of 1998)

(i) 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 Environmental Management Programme/EMPr must be read in conjunction with the Basic Assessment Report dated August 2022 and all specialist reports/inputs. 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, rehabilitation, operational and maintenance 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.

### **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 all phases of this project.

## 2. PROJECT DETAILS

The site is located in Keurboomstrand, a resort town near Plettenberg Bay in the Western Cape, under the jurisdiction of the Bitou Municipality. RE/155, Keurboomstrand (56 615,4m<sup>2</sup> in extent) contains large areas of undeveloped coastal forest vegetation as well as developed areas that are part of a share block resort abutting the western end of the Keurboomstrand residential neighbourhood (some of which are located on Erf 151, alongside).

The subject site is undeveloped, containing no existing buildings, services or infrastructure (with one exception being some decommissioned water pipelines and associated infrastructure). It is offset from the nearest road (Main Street) by the 27m width of the adjoining public place (Erf 391), which shares its northern boundary. Its southern boundary is delineated by the 25m wide road servitude set out for Main Road 394, which is the main access and entrance road for the whole of the Keurboomstrand town. The eastern and western boundaries are shared with Erf 152 and Erf 155, respectively.

The proposal is to subdivide a portion of roughly 5 000m<sup>2</sup> located directly abutting and between Keurboomstrand residential erven (15, 20 and 565) and public place (Erf 391) off the private open space and to use approximately 3 250m<sup>2</sup> for the construction of three dwelling houses with a shared swimming pool in a sectional title development, zoned Residential Zone II.

Three development alternatives were assessed in the visual impact assessment report. A 35m scenic route setback was put in place by the visual impact specialist for all alternatives. This is to provide a reduced visual intrusion along a scenic route into and out of Keurboomstrand and the town of Plettenberg Bay. The units will incorporate low-pitched roofing and earth-toned colours. In addition, botanical sensitive areas have been marked as no-go areas and provided an additional 5m buffer offset from the proposed development. However, all development alternatives occur within the buffer area.

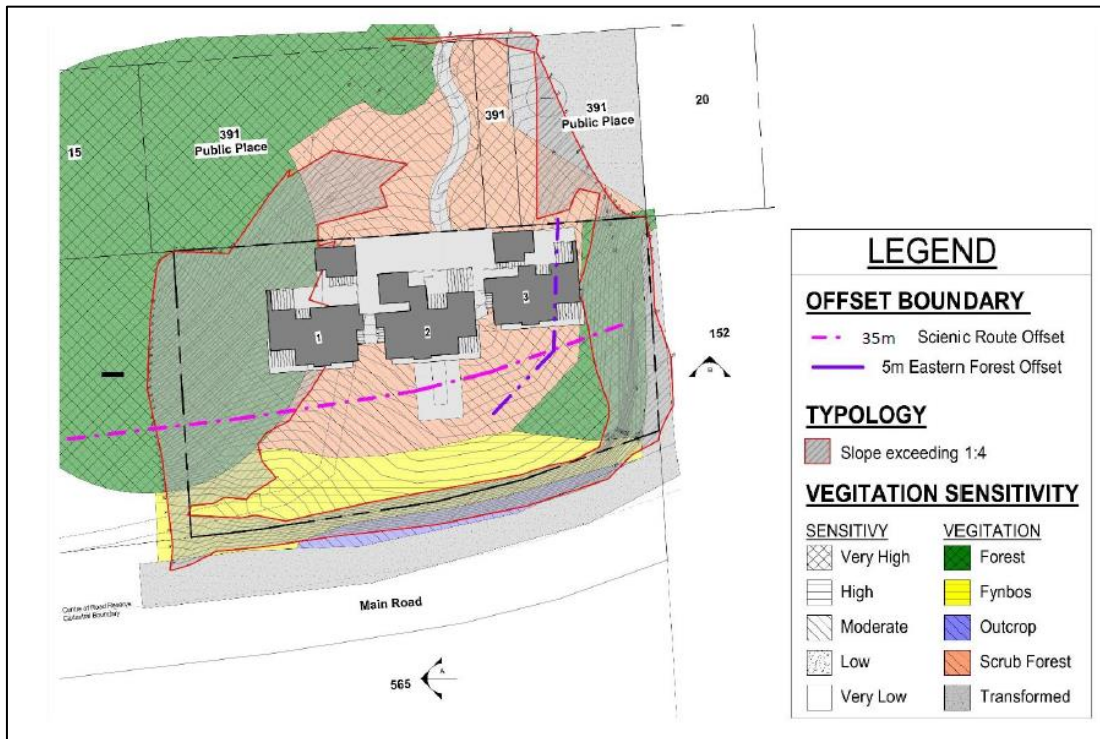


Figure 1: Alternative 1 showing botanical sensitivity, geotechnical and visual sensitivity no-go areas and setbacks/offsets (van der Merwe, 2021)

### Water Supply

Water will be supplied to the development from the existing Keurboomstrand reservoir. The proposed connection point for the development on RE/155 is at the existing 75mm water main in adjacent park Erf 691. It is proposed that a 75 mm bulk meter connection be made to the municipal mains.

An alternative method of water supply would be the harvesting of rainwater. However, rainwater should be considered as a supplementary supply for non-potable use, unless treated.

### Sewerage

In terms of the Municipal Sewer Masterplan and already approved developments there is no spare capacity for the proposed development in various sections of the sewer network and upgrades are required to accommodate this development.

Due to capacity constraints an alternative to the municipal connection has been proposed by the engineer. An interim alternative will be to provide a combined 24 000 litre conservancy tank. The municipal approved conservancy tank is to be constructed at an approved position to allow municipal and or private tanker access.



## Electricity

The electricity supplier is Bitou Municipality. The development will need to be linked to the existing municipal infrastructure.

## Solid Waste Management

The development will be incorporated into the Bitou Municipal solid waste stream. Regular waste collection at the proposed site is of utmost importance to prevent the degradation of the overall environment; as well as to prevent scavenging by fauna and indigent communities. Recycling of waste will be implemented for the lifespan of the proposed project.

A services agreement will be negotiated with the Bitou Municipality by the developer.

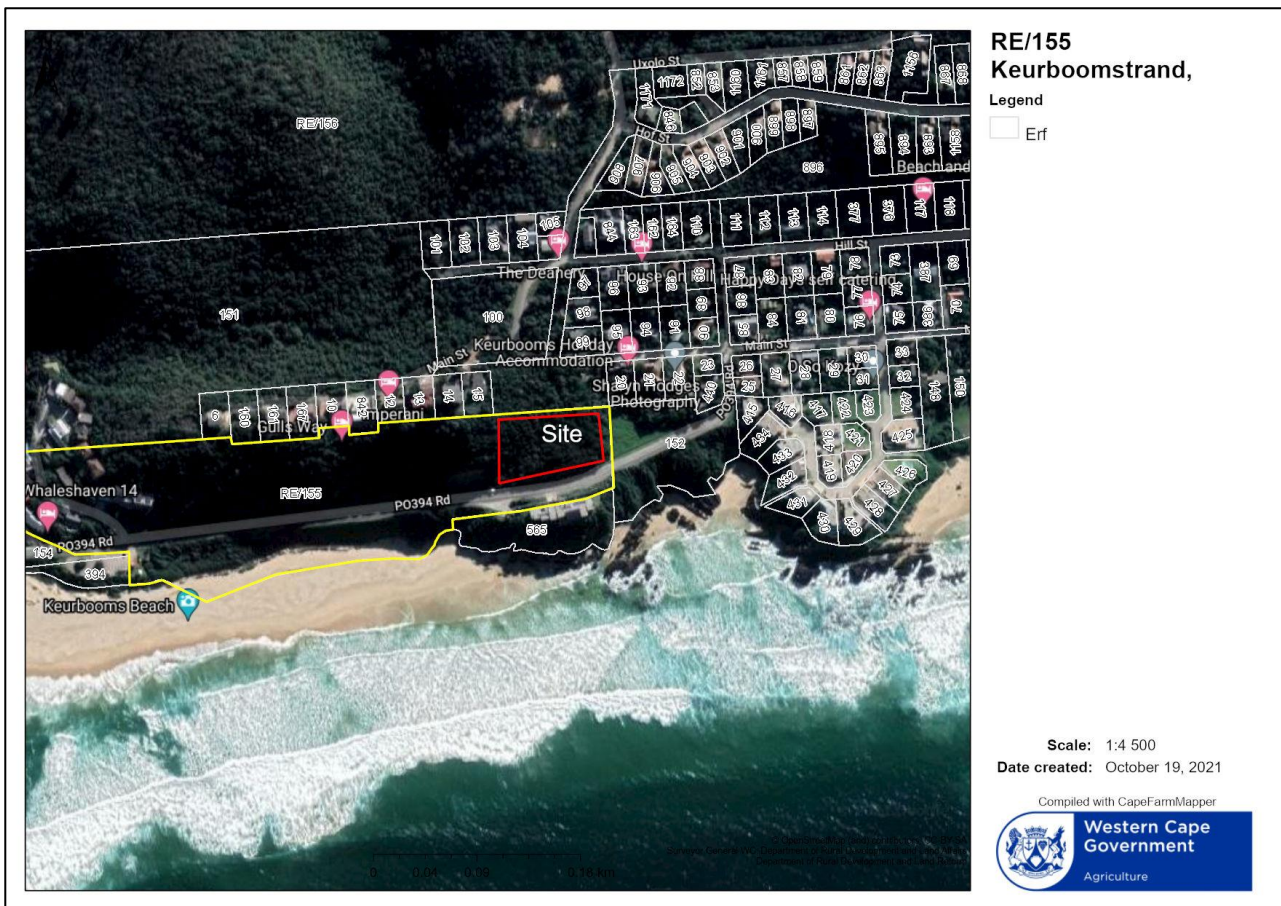


Figure 1: Location Map of the proposed development



Figure 2: Biodiversity Sector Plan

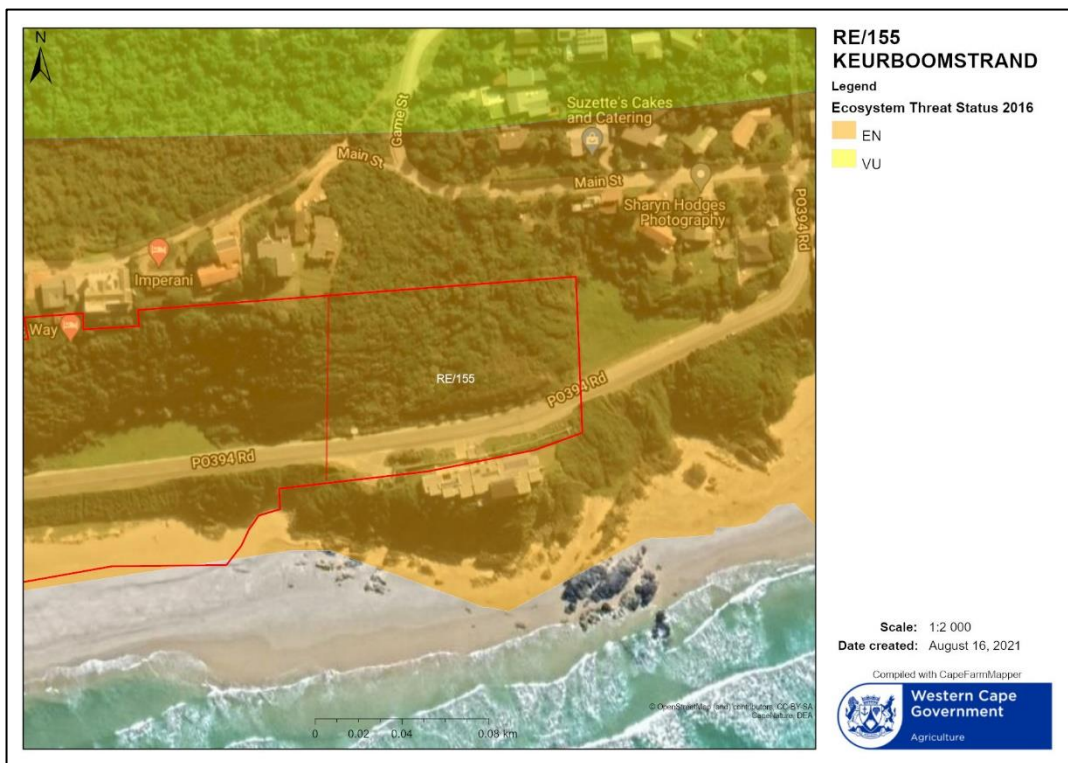


Figure 3: National Threatened Ecosystems

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

<b>Alternative: PREFERRED ALTERNATIVE</b>	
<b>PLANNING, DESIGN AND DEVELOPMENT PHASE</b>	
<b>Potential impact and risk:</b>	
Nature of impact:	<b>Impact on biodiversity (flora and fauna)</b>
Extent and duration of impact:	<b>Local, short-term</b>
Consequence of impact or risk:	<b>Negative</b>
Probability of occurrence:	<b>High</b>
Degree to which the impact may cause irreplaceable loss of resources:	<b>Low</b>
Degree to which the impact can be reversed:	<b>Low</b>
Indirect impacts:	<b>Negligible, loss of 0.0003 percent of vegetation unit that is already well protected and exceeds conservation target of 19 %.</b>
Cumulative impact prior to mitigation:	<b>Low</b>
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Medium</b>
Degree to which the impact can be avoided:	<b>High</b>
Degree to which the impact can be managed:	<b>High</b>
Degree to which the impact can be mitigated:	<b>Medium</b>
Proposed mitigation:	<b>Most sensitive areas are excluded from development footprint. Dwelling should not extend into the fynbos on the south, the dune forest-thicket on the north-west and a band of dune thicket-forest along the slope on the eastern boundary.</b>
Residual impacts:	<b>Negligible</b>
Cumulative impact post mitigation:	<b>Negligible, loss of 0.0003 percent of vegetation unit that is already well protected and exceeds conservation target of 19 %.</b>
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Low</b>
<b>Alternative: PREFERRED ALTERNATIVE</b>	
<b>CONSTRUCTION PHASE</b>	
<b>Potential impact and risk:</b>	
Nature of impact:	<b>Impact on biodiversity (flora and fauna)</b>
Extent and duration of impact:	<b>Local, short-term</b>
Consequence of impact or risk:	<b>Negative</b>
Probability of occurrence:	<b>High</b>
Degree to which the impact may cause irreplaceable loss of resources:	<b>Low</b>
Degree to which the impact can be reversed:	<b>Low</b>
Indirect impacts:	<b>Negligible, loss of 0.0003 percent of vegetation unit that is already well protected and exceeds conservation target of 19 %.</b>
Cumulative impact prior to mitigation:	<b>Low</b>
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Medium</b>
Degree to which the impact can be avoided:	<b>High</b>

Degree to which the impact can be managed:	<b>High</b>
Degree to which the impact can be mitigated:	<b>Medium</b>
Proposed mitigation:	<b>Most sensitive areas are excluded from development footprint. Dwellings should not extend into the fynbos on the south, the dune forest-thicket on the north-west and a band of dune thicket-forest along the slope on the eastern boundary.</b>
Residual impacts:	<b>Minor</b>
Cumulative impact post mitigation:	<b>Negligible, loss of 0.0003 percent of vegetation unit that is already well protected and exceeds conservation target of 19 %.</b>
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Low</b>
<b>Alternative: PREFERRED ALTERNATIVE</b>	
<b>CONSTRUCTION PHASE</b>	
<b>Potential impact and risk:</b>	
Nature of impact:	<b>Stormwater runoff and erosion</b>
Extent and duration of impact:	<b>Local , long-term</b>
Consequence of impact or risk:	<b>Negative</b>
Probability of occurrence:	<b>High</b>
Degree to which the impact may cause irreplaceable loss of resources:	<b>Low</b>
Degree to which the impact can be reversed:	<b>Medium with mitigation</b>
Indirect impacts:	<b>Low – medium: dependant on severity of runoff and erosion without mitigation measures in place</b>
Cumulative impact prior to mitigation:	<b>Medium</b>
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Medium</b>
Degree to which the impact can be avoided:	<b>High</b>
Degree to which the impact can be managed:	<b>High</b>
Degree to which the impact can be mitigated:	<b>High</b>
Proposed mitigation:	<ul style="list-style-type: none"> <li>• <b>During construction the contractor must ensure that stormwater and erosion prevention methods are used. These include the use of sandbags and silt traps to be installed where the natural flow of water has been pre-determined prior to construction.</b></li> <li>• <b>The contractor must ensure that the site has been properly stabilised once vegetation has been removed.</b></li> <li>• <b>Continuous monitoring for erosion impacts must occur during the construction phase.</b></li> <li>• <b>The developer must ensure that a specialist is contracted to compile a stormwater management plan and implement a reliable stormwater drainage system. Continuous stormwater and erosion monitoring and maintenance must occur during the operational phase of the project.</b></li> <li>• <b>Rainwater tanks must be implemented to collect stormwater from the roof of dwellings.</b></li> </ul>

	<ul style="list-style-type: none"> <li>No unnecessary land clearance must take place.</li> </ul> <p><b>Hardened structures should be kept to a minimal.</b></p>
Residual impacts:	<b>Low</b>
Cumulative impact post mitigation:	<b>Low</b>
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Low</b>
<b>Alternative: PREFERRED ALTERNATIVE</b>	
<b>CONSTRUCTION PHASE</b>	
<b>Potential impact and risk:</b>	
Nature of impact:	<b>Visual impact / Sense of place</b>
Extent and duration of impact:	<b>Local, short-term</b>
Consequence of impact or risk:	<b>Negative</b>
Probability of occurrence:	<b>Highly probable</b>
Degree to which the impact may cause irreplaceable loss of resources:	<b>None</b>
Degree to which the impact can be reversed:	<b>None</b>
Indirect impacts:	<b>Low</b>
Cumulative impact prior to mitigation:	<b>Medium</b>
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Medium</b>
Degree to which the impact can be avoided:	<b>Low</b>
Degree to which the impact can be managed:	<b>Medium</b>
Degree to which the impact can be mitigated:	<b>Medium</b>
Proposed mitigation:	<ul style="list-style-type: none"> <li>Screening and hoarding must be placed around the construction footprint.</li> <li>Location and management of site access must be proactively managed to decrease visual clutter.</li> <li>Storage on site must be kept to a minimal.</li> <li>The design of the dwelling must consider the design parameters of the neighbourhood and follow suit.</li> <li>Reconsideration must be given to the inclusion of the swimming pool in order to provide a low visual impact.</li> <li>It is recommended that earth-tones be used when picking paint colours for the roof and exterior walls.</li> <li>Down lights should be used as much as possible.</li> </ul> <p><b>Refer to the Architectural Guidelines report in Appendix G for precise building guidelines.</b></p>
Residual impacts:	<b>Low</b>
Cumulative impact post mitigation:	<b>Low</b>
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Low</b>
<b>Alternative: PREFERRED ALTERNATIVE</b>	
<b>CONSTRUCTION PHASE</b>	
<b>Potential impact and risk:</b>	
Nature of impact:	<b>Noise pollution</b>
Extent and duration of impact:	<b>Local, short-term</b>
Consequence of impact or risk:	<b>Negative</b>

Probability of occurrence:	<b>Highly probable</b>
Degree to which the impact may cause irreplaceable loss of resources:	<b>None</b>
Degree to which the impact can be reversed:	<b>Irreversible – impact will only be experienced during the construction phase</b>
Indirect impacts:	<b>Negligible</b>
Cumulative impact prior to mitigation:	<b>None</b>
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Low - Medium</b>
Degree to which the impact can be avoided:	<b>Low</b>
Degree to which the impact can be managed:	<b>Low</b>
Degree to which the impact can be mitigated:	<b>Low</b>
Proposed mitigation:	<ul style="list-style-type: none"> <li>• <b>Construction may only occur during weekdays from 07:00am – 17:00pm.</b></li> <li>• <b>Staff must be instructed to keep noise levels at a minimum.</b></li> <li>• <b>Where necessary, machines must be fitted with silencers to reduce noise impacts.</b></li> </ul>
Residual impacts:	<b>Negligible</b>
Cumulative impact post mitigation:	<b>Low – Medium</b>
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Low</b>
<b>Alternative: PREFERRED ALTERNATIVE</b>	
<b>CONSTRUCTION PHASE</b>	
<b>Potential impact and risk:</b>	
Nature of impact:	<b>Socio-economic – Job creation</b>
Extent and duration of impact:	<b>Local, short-term</b>
Consequence of impact or risk:	<b>Positive</b>
Probability of occurrence:	<b>Definite</b>
Degree to which the impact may cause irreplaceable loss of resources:	<b>N/A</b>
Degree to which the impact can be reversed:	<b>N/A</b>
Indirect impacts:	<b>Economic contribution to the local municipality</b>
Cumulative impact prior to mitigation:	<b>N/A</b>
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>N/A</b>
Degree to which the impact can be avoided:	<b>N/A</b>
Degree to which the impact can be managed:	<b>N/A</b>
Degree to which the impact can be mitigated:	<b>N/A</b>
Proposed mitigation:	<b>N/A</b>
Residual impacts:	<b>Minor</b>
Cumulative impact post mitigation:	<b>N/A</b>
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Low positive</b>
<b>Alternative: PREFERRED ALTERNATIVE</b>	
<b>CONSTRUCTION PHASE</b>	
<b>Potential impact and risk:</b>	
Nature of impact:	<b>Cultural – historic impacts</b>
Extent and duration of impact:	<b>Local, short term</b>
Consequence of impact or risk:	<b>Negative</b>

Probability of occurrence:	<b>Low</b>
Degree to which the impact may cause irreplaceable loss of resources:	<b>Low</b>
Degree to which the impact can be reversed:	<b>Low</b>
Indirect impacts:	<b>Low – medium, if cultural/historic artefacts are uncovered.</b>
Cumulative impact prior to mitigation:	<b>Low</b>
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Medium – High</b>
Degree to which the impact can be avoided:	<b>High</b>
Degree to which the impact can be managed:	<b>High</b>
Degree to which the impact can be mitigated:	<b>Low – medium</b>
Proposed mitigation:	<b>An archaeologist must be on site during ground clearing activities. Should any remains or artefacts be uncovered during the construction phase, all works must be halted with immediate effect and Heritage Western Cape must be contacted.</b>
Residual impacts:	<b>Low</b>
Cumulative impact post mitigation:	<b>Low/ negligible</b>
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Low</b>
<b>OPERATIONAL PHASE</b>	
<b>Potential impact and risk:</b>	
Nature of impact:	<b>Visual impact / Sense of place</b>
Extent and duration of impact:	<b>Local, long-term</b>
Consequence of impact or risk:	<b>Negative</b>
Probability of occurrence:	<b>Probable</b>
Degree to which the impact may cause irreplaceable loss of resources:	<b>N/A</b>
Degree to which the impact can be reversed:	<b>Irreversible</b>
Indirect impacts:	<b>Low - Medium</b>
Cumulative impact prior to mitigation:	<b>Low - Medium</b>
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Medium</b>
Degree to which the impact can be avoided:	<b>Low</b>
Degree to which the impact can be managed:	<b>Medium</b>
Degree to which the impact can be mitigated:	<b>Medium</b>
Proposed mitigation:	<ul style="list-style-type: none"> <li>• The design of the dwelling must consider the design parameters of the neighbourhood and follow suit.</li> <li>• Reconsideration must be given to the inclusion of the swimming pool in order to provide a low visual impact.</li> <li>• It is recommended that earth-tones be used when picking paint colours for the roof and exterior walls.</li> <li>• Down lights should be used as much as possible.</li> </ul> <b>Refer to the Architectural Guidelines report in Appendix G for precise building guidelines.</b>
Residual impacts:	<b>Low – Medium</b>
Cumulative impact post mitigation:	<b>Low</b>

Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Low</b>
<b>DECOMMISSIONING AND CLOSURE PHASE</b>	
<b>Potential impact and risk:</b>	
Nature of impact:	<b>Impact on biodiversity (flora and fauna)</b>
Extent and duration of impact:	<b>Local, short term</b>
Consequence of impact or risk:	<b>Negative</b>
Probability of occurrence:	<b>Low</b>
Degree to which the impact may cause irreplaceable loss of resources:	<b>Low</b>
Degree to which the impact can be reversed:	<b>High</b>
Indirect impacts:	<b>Negligible</b>
Cumulative impact prior to mitigation:	<b>Low</b>
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Low</b>
Degree to which the impact can be avoided:	<b>High</b>
Degree to which the impact can be managed:	<b>High</b>
Degree to which the impact can be mitigated:	<b>Medium</b>
Proposed mitigation:	<b>Retained natural vegetation must not be cleared (recommend incorporating into title deed)</b>
Residual impacts:	<b>Negligible</b>
Cumulative impact post mitigation:	<b>Negligible, loss of 0.0003 percent of vegetation unit that is already well protected and exceeds conservation target of 19 %.</b>
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	<b>Very low</b>

### 3.2 Specialist inputs and recommendations

#### Terrestrial Biodiversity Assessment – Jamie Pote

- It is the conclusion of this terrestrial biodiversity assessment that the limited footprint site and associated infrastructure, including pipeline, sewer and other services can be constructed within acceptable terrestrial biodiversity impact limits.
- The portions of intact vegetation should be retained as per the recommendation of this report, including the dune-thicket along the eastern slope, the fynbos pocket on the southern portion and the forest-thicket due on the north-western side of the site.
- Vegetation that will not require direct clearing for the dwellings to be constructed should be retained as far as possible, in order to fit in with the surrounding developed landscape.
- The undeveloped portions of Erf 155 have limited development potential due to the steep slope. These areas have good representation of dune thicket and forest-thicket as well as some fynbos patches at the base (between the dune base and the road). It is unlikely that these will be developable due to slope and should thus be retained. In this regard, development of the 2 500 m<sup>2</sup> within the dwelling footprints will only be 50 % of the proposed subdivision area (5 000 m<sup>2</sup>. In conjunction with the remainder of Erf 155 that will not be developed (± 4 Ha of Dune Thicket and Dune Forest, excluding some coastal vegetation and beach that falls on the south of the road but within the erf boundary), the footprint is well within regional and national conservation targets, even though situated within a CBA area.
- It is noted that around 70 % of the site will not be developed and is unlikely to be developed due to slope, which far exceeds the conservation target of 19 %, within a vegetation unit where conservation targets are already exceeded in designated protected areas.



Influence on development:

The development has been designed to remain within the identified sensitive area of least concern. The preferred option was chosen specifically due to the outcomes and recommendations made by the biodiversity specialist. The preferred option has the smaller development footprint of the three alternatives.

### **Engineering Services Report - Tuiniqua (Pty) Ltd**

#### Water Supply

Water will be supplied to the development from the existing Keurboomstrand reservoir. The proposed connection point for the development on Erf 155 is at the existing 75mm water main in adjacent park Erf 691. It is proposed that a 75 mm bulk meter connection be made to the municipal mains.

An alternative method of water supply would be the harvesting of rainwater. However, rainwater should be considered as a supplementary supply for non-potable use, unless treated.

#### Sewerage

In terms of the Municipal Sewer Masterplan and already approved developments there is no spare capacity for the proposed development in various sections of the sewer network and upgrades are required to accommodate this development.

Due to capacity constraints an alternative to the municipal connection has been proposed by the engineer. An interim alternative will be to provide a combined 24 000 litre conservancy tank. The municipal approved conservancy tank is to be constructed at an approved position to allow municipal and or private tanker access.

#### Access

A landuse application will be made for access to the development via a seven-meter-wide servitude right of way access over Erf 391 (zoned as public place). The servitude will allow direct access to the site via Main Street.

The access road will be a minimum of 5,5m wide.

#### Recommendation

Subject to the requirements as listed in the report above, the proposed rezoning and development of the portion of erf 155 Keurboomstrand is recommended for the preferred option of 3 dwellings from a servicing point of view.

Influence on development:

The preferred option was chosen as it would have the least impact on municipal infrastructure and services.

### **Electrical Services Report – Clinkscapes Maughan-Brown (South) (Pty) Ltd**

The electricity supplier is Bitou Municipality. The development will need to be linked to the existing municipal infrastructure.

The specialist has further recommended the following energy saving measures:

- The use of solar geysers or heat pumps to heat water instead of electric heater elements.
- The electricity used to heat water to be reduced by reducing the amount of hot water used by fitting low-flow faucet aerators.
- Thermal insulation of geysers (geyser blankets) and hot water pipes.
- Load management systems to limit load in buildings, i.e. geyser control relays to switch of geysers during peak periods, load control relays to prevent geysers and other high load appliances in buildings from operating simultaneously, etc.
- Heating, ventilation and air conditioning generally use the most electricity in a building. Through efficient operational management of these systems, the demand can be reduced by at least 15%.
- The use of LPG gas for heating and cooking.
- Energy efficient lighting design, making use of LED lighting and motion / photo detectors to switch off lighting in un-used sections of buildings and to automatically adjust lighting levels according to the amount of natural lighting in buildings, etc.
- The installation of energy efficient appliances and electronic devices, i.e. refrigerators, motors, pumps, fans, etc.
- Consideration will also be given to install a rooftop Photo Voltaic (PV) installation to reduce electricity consumption from the municipal grid, and to supplement the supply as necessary.

Influence on development:

Energy saving measures will be incorporated into the development, where possible.

#### **Traffic Impact Statement – Innovative Transport Solutions**

Based on the evaluation in this report, the conclusions and recommendations are as follows:

- The existing traffic volumes along the surrounding road network in the site vicinity is low.
- Trips generated by the proposed development will be less than 10 trips during the typical weekday peak hours, which is low.
- The surrounding road network has sufficient capacity to accommodate the trips associated with the proposed development, even during the peak holiday periods.
- The access spacing is acceptable and the available shoulder sight distance in both directions along Main Street is sufficient.
- No public transport or NMT facilities are recommended for the development.
- The proposed development will have a low negative significance in terms of the transport impact.
- It is recommended that the development be approved from a transport impact perspective.

Influence on development:

The development will not have traffic impacts.

#### **Geotechnical Report – Outeniqua Geotechnical Services**

Earthworks: The presence of shallow rock may hamper earthworks and deep excavations but will generally provide a highly stable and suitable founding medium. Excavations deeper than 0.5m can be provisionally classified as "hard", requiring mechanical wedging and splitting (e.g. jackhammer/hydraulic pecker). No blasting is likely to be permitted in this residential area. It proposed that the proposed dwellings are designed and positioned in a manner which will take into

account the terrain and underlying geotechnical conditions, such that minimal earthworks or terracing will be necessary (i.e. split levels or suspended structures).

The insitu soil and weathered rock is suitable for use as general fill material under surface beds and around foundations, less any oversize rock fragments and boulders >100mm.

No earthworks or development is recommended on slopes steeper than 1:4, unless special engineering solutions are developed, and no development is recommended within a buffer zone of 5m from the top of slopes which exceed a gradient of 1:2 (most notably along the southern boundary).

Foundations & floors: Single and/or double storey masonry or timber structures can be founded on conventional strip/pad foundations on clean, tight bedrock at a minimum depth of 0.5m below GL. Light reinforcement of strip footings is recommended to span across irregular rock/ soil ground conditions that may occur in linear trenches. A safe design bearing pressure on very soft, highly weathered bedrock is 250kPa. But since foundations may span across rock and soil, bearing pressures should be kept to max 150kPa. The engineer should inspect foundations before casting to ensure suitable founding conditions and no undetected problems or areas where no rock was encountered in trenches. Specialist geotechnical advice should be sought in cases where the conditions encountered in foundation trenches differ vastly from that reported in the investigations.

Fill material supporting ground floor concrete surface beds must be minimum G7 quality, compacted to 95% MDD and tested for approval by the engineer. Suspended floor slabs should be considered where fill heights are excessive to minimise importation of fill.

Driveway & parking areas: The subgrade conditions along the access road are likely to be good (gravelly) and will suffice as a selected layer. The access road should be cut with adequate camber for side drains to a roadbed level of approximately NGL-350mm, compacted to 93%MDD, and an imported G5 subbase layer of 150mm thick placed and compacted to 95%MDD. Cement/clay brick pavers can be placed on 20mm bedding sand.

Drainage: Vertical infiltration of stormwater will be restricted due to shallow rock, resulting in a significant percentage of run-off from the site. Effective stormwater drainage systems are recommended to collect, handle and discharge stormwater across the site such that it does not cause erosion on slopes or undermining of structures. Subsoil drains are required behind any retaining walls as standard practice.

#### Conclusions:

The investigation indicates generally favourable geotechnical conditions for the proposed development and the site is considered generally suitable in terms of these conditions but there are some constraints that may require consideration from the designers.

#### Influence on development:

The development site and layout were chosen in accordance with the acceptable ground conditions stipulated by the specialist. Construction will need to further comply with the mitigation measures and recommendations made by the specialist.

### **Heritage Impact Assessment – Emmylou Rabe Bailey (Hearth Heritage)**

According to the specialist reports, there is no evidence of historic or prehistoric occupation of the site. Consequently, the site is regarded to be of low to negligible sensitivity from an archaeological

and palaeontological heritage perspective and there are no objections to the proposed residential development on Erf 155 on condition that:

1. Due to the dense vegetation and limited archaeological visibility, a suitably qualified archaeologist should do a foot survey of the site intermittently during clearing of vegetation and once vegetation has been finally cleared before any earthworks are to commence.
2. Although unlikely, there may be buried or currently hidden archaeological material, including human remains, present on site and should these be uncovered or exposed during excavations or vegetation clearing, HWC should be notified immediately and all development work on site (preconstruction included) should be halted until these finds are investigated by HWC (Att: Ms Waseefa Dhansay 021 483 9685).
3. No negative impact to significant palaeontological heritage is anticipated as the palaeontological sensitivity of the geology of the development area is considered to be very low and there are no objections on palaeontological heritage grounds. In the event of important fossil material being identified during excavations, the HWC Fossil Finds Procedure must be implemented.

#### **Desktop study: Palaeontological Heritage Assessment – John E. Almond (Natura Viva cc)**

The project area for the proposed residential development on a Portion of Remainder of Erf 155, Keurboomstrand, is underlain by Early Devonian marine to coastal sediments of the Baviaanskloof Formation (uppermost Table Mountain Group). Elsewhere along the Southern Cape coast dark, organic-rich mudrocks within this formation contain important, largely unstudied fossils of primitive land plants while a small range of shelly invertebrate and trace fossils occur within sandstone facies in parts of the Western Cape. The overlying Late Caenozoic superficial sediments (colluvium, coversands, soils etc) are probably largely or entirely unfossiliferous.

The DEFF Screening Tool does not highlight the potentially high palaeosensitivity of the Keurboomstrand residential development project area while this is assigned a MEDIUM sensitivity on the SAHRIS Palaeosensitivity Map. However, given (1) the demonstrated presence of dark grey mudrocks of the Baviaanskloof Formation, both at surface and within test pits within the project area, and (2) the potential of these mudrocks to contain scientifically valuable fossils, most notably primitive terrestrial plants, a precautionary approach is appropriate here. Pending a specialist palaeontological site visit, the bedrocks should be provisionally assigned a HIGH to VERY HIGH palaeosensitivity.

As a condition for Environmental Authorisation of the proposed development, it is recommended that a pre-construction site visit be made by a palaeontological specialist. This is to (1) record any near-surface fossil material and its geological context, (2) assess the site's palaeosensitivity and potential impacts on fossil heritage posed by the development, and (3) make appropriate recommendations for any further palaeontological monitoring or mitigation measures (if any) to be taken in the pre-construction and / or construction phases. The specialist palaeontological field report should be submitted for comment to Heritage Western Cape.

Influence on development:

Due to the high palaeosensitivity on the development site, the EMPr will include instruction to conduct a pre-construction site visit by a palaeontologist. Construction may not begin prior to this site visit and report submission being undertaken.

## Visual Impact Assessment – Fi Smit (Filia Visual Pty Ltd)

### Findings:

The findings of the Visual Impact assessment indicate that Alternative 1 will have the lowest visual impact overall. Alternative 2 will have higher visual impact on the scenic route, while Alternative 3 will most likely have higher visual impact on sensitive receptors (locals and neighbours). Alternative 1 (sans the swimming pool) remains the most responsive to the visual sensitivities of the site; is the least visible from the surrounding receiving environment; and will impact minimally on key aspects of Landscape Character and Sense of Place.

The Cumulative visual impact of all three Alternatives on sensitive features, hills and ridgelines will be comparable; but Alternative 2 is the most visually intrusive, especially at the threshold of the town, along the scenic route. While a measure of urbanity that develops over time may be acceptable within the town proper, an entrance to what has been described as a resort town with a distinctive local character has a much lower tolerance for large, intrusive and visually dominant structures that are not embedded in the local forest and scrub forest vegetation.

The VIA does not support any one of the Alternatives outright, as none of the proposals comply substantially with both the recommendations of the Draft VIA and the visual sensitivity setbacks provided.

### Conditions & Recommendations:

Visual Sensitivity parameters for all Alternatives

To augment the botanical and geotechnical sensitivity mapping, the following visual sensitivity parameters have been established and should be adhered to in the final proposal:

- a) A **35m Scenic route setback (offset)** that delineates a no-go area for development on the site from the part of the receiving environment with the highest exposure and sensitivity;
- b) Additional **5m offset** from the eastern ecological and slope sensitivity exclusion area, to ensure that the dense forest vegetation screening views of the proposed development from the east remains unaffected by development.
- c) Adherence to the key parameters of the Architectural Guidelines, which includes:
  - Adherence to the height restriction;
  - Adherence to Single Residential II Zoning Scheme Regulations;
  - Adherence to 1:4 slope no-go areas, the botanical and geotechnical development limitations;
  - Offsets and restrictions described in the VIA (scenic route and slope/vegetation offsets)
  - Specification of appropriate finishes (Material, colour and texture)
  - Use of local materials, products and indigenous plants;
  - Approach to site-wide design: buildings to be appropriately scaled and seen as an extension of the natural landscape; to be nestled within vegetation and natural sloping topography;
  - Avoid large retaining structures, plinths and building platforms i.e.; a balanced approach towards cutting and filling of the site;
  - Limit visual impact, visibility and light pollution in relation to neighboring properties;
  - Limit the clearance of vegetation during construction phase and beyond;

Due to the high value and sensitivity of the receiving environment, landscape character and the visual receptors, it is extremely important that a responsible and enforceable design approach be taken for the planning, construction and operational phases of each dwelling unit and the development as a whole, taking care to minimize the visual impact wherever possible. The Site

Development Plan (SDP) and building plans must demonstrate adherence to the recommendations of this report in order for visual impact to be managed successfully.

Given that none of the Alternatives are compliant with the visual sensitivity parameters, the proposal should be revised to avoid biodiversity and visual impacts, by proposing buildings within the developable area only (indicated by the Botanical, Geotechnical and Visual sensitivity offsets and no-go areas).

Additional information required for SDP level approvals

As a condition of approval for the Rezoning and Subdivision Land use planning approval (this approval), this VIA recommends that the following documents and plans be submitted along with SDP and building plans to the local municipality for approval:

- i. A Landscape Plan and Landscape Guidelines by a suitably experienced and qualified professional, registered with SACLAP;
- ii. An Environmental Management Programme (EMPr) by a suitably experienced and qualified professional.

Potential impacts will be reduced by adherence to the management actions and mitigation measures outlined in Section 7, which are to be incorporated into either the Landscape Plan and Landscape Guidelines or the EMPr (or both). Please note that there are general architectural recommendations and mitigation measures that speak to (a) siting, layout of buildings and relationship to landscape features; (b) architectural features, and (c) materials and colours. These are reinforced in the August 2021 Architectural Guidelines.

These are followed by Landscape related recommendations and mitigation measures that speak to (a) the clearing of vegetation; (b) landscape/outdoor lighting; (c) fencing; (d) materials and finishes; (e) plant species and landscape installation; (f) alien control and management, and finally the relationship of the proposed development to the open space system and public realm.

Lastly, recommendations and mitigation measures to be incorporated into the EMPr are provided. The landscape guidelines and the EMPr should be mutually supportive, where guidelines set up by the Landscape Plan and Guidelines document are implemented or enabled by the EMPr, and vice versa.

Should the conceptual architectural proposal undergo significant change during further design processes, a visual impact statement must be issued by a suitably qualified specialist to re-assess the potential visual impact and determine if the findings of this study remain unchanged.

### **Architectural Guidelines – Rust van der Merwe**

Adding to the general design approach consideration, the following should also be considered and incorporated into the proposed development design.

The building form, elements and materiality should be conceived as an extension of the natural environment and landscape. This can be achieved by sharing building resources and requirements.

Examples:

- Parking, roof Terrace and landscaping to serve as rooftops (insulation, multi-purpose space, increase development potential, great visual response and approximations)

- The building can be cut into landscape to decrease visibility and increase building mass (insulation). It also has the potential to increase development bulk and potential with a limited visual impact. Basements can also be used and serve as retaining and building plinth structures.
- Use of environmental and climate resources to limit building operational, maintenance and service requirements.
- Climate resources such as water harvesting, passive cooling and heating, solar gain and shading, natural ventilation can assist in reducing the building services required (also reduce visibility and limit screening requirement for services) and building operational cost
- Vegetation can be used for shading, screening, visibility, landscaping, privacy, security and noise population reduction.

The development potential is limited due to sensitivity constraints posed by the site's natural sloping topography and vegetation/ plant species which has a direct impact on the site vegetation clearance area for the construction and development of the proposed. The development is also limited due to high visual resources and sensitivity of the site, scenic route and greater receiving environment.

It's also important to note that the development must not be intrusive on the it's surrounding context, especially due to its nature, location and potential impact on sensitive receptors. Privacy, visibility and noise- and light pollution is of importance so that the development is conceived as not to being occupied permanently and contribute to the local town's seasonal and vacation atmosphere.

Influence on development:

The development design and siting were influenced by the architectural guidelines. The construction phase will need to strictly follow the mitigation measures provided by the specialist in order for the conservation of indigenous vegetation, the visual impact to be low, and to decrease the extent of cut and fill required. These mitigation measures will be incorporated into the EMPr.

## 4. LEGISLATIVE REQUIREMENTS

### 4.1 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 Proponent), 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.

### 4.2 Legislation

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

LEGISLATION	ADMINISTERING AUTHORITY
National Environmental Management Act (Act No. 107 of 1998) and the 2014 EIA Regulations as amended	Department of Forestry, Fisheries and the Environment
Environmental Conservation Act (Act No. 73 of 1989)	Department of Forestry, Fisheries and the Environment
National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	Department of Forestry, Fisheries and the Environment
National Environmental Management: Protected Areas Act (Act No. 57 of 2003) as amended by the National Environmental Management: Protected Areas Act No.21 of 2014	Department of Forestry, Fisheries and the Environment
National Forests Act (Act No. 84 of 1998)	Department of Forestry, Fisheries and the Environment
Forestry Laws Amendment Act (Act No. 35 of 2005)	Department of Forestry, Fisheries and the Environment
National Water Act (Act No. 36 of 1998)	Department of Water and Sanitation
Conservation Of Agricultural Resources Act (Act No. 43 of 1983)	Department of Forestry, Fisheries and the Environment
National Heritage Resources Act (Act No. 25 of 1999)	The South African Heritage Resources Agency

### 4.3 Project Responsibilities

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

The ECO's responsibilities must include, *inter alia*:

- ❖ Protect the receiving environment.
- ❖ Guide, advise and consult the relevant authority on environmental issues.
- ❖ 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 Proponent, Site Manager and the ECO. A tabulated synopsis of relevant responsibilities is appended hereto.

## **5. REPORTING PROCEDURES**

### **5.1 Documentation**

The following documentation must be kept on site in order to record compliance with the EMPr:  
An Environmental File which includes:

- ❖ Hardcopy of the EMPr;
- ❖ Copy of the Environmental Authorisation.
- ❖ 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.

### **5.2 Environmental Register**

The Proponent 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.

### 5.3 Non-Conformance Report

A Non-Conformance Report (NCR) will be issued to the Proponent 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 Proponent in writing. Preceding the issuing of a NCR, the Proponent 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 an 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 Proponent should sign the Close-Out portion of the Non-Conformance Form and file it with the contract documentation.

### 5.4 Environmental Emergency Response

The Proponents 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.

## 6. COMPLIANCE WITH THE EMPr

### 6.1 Monitoring and Compliance

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

- ❖ The ECO has the authority to instruct the Proponent to cease a particular operation causing or liable to cause significant environmental damage, and issue fines or penalties for non-compliance of the EMPr.
- ❖ An Environmental Control Officer (ECO) must inspect the site every week and compile an audit report on a monthly basis until rehabilitation is successful.
- ❖ The holder of the environmental authorisation (the Proponent) is responsible to ensure that an environmental audit report is submitted to the Department of Environmental Affairs and Development Planning (DEA&DP) as per the timeframes stipulated in the Environmental Authorisation (EA).

### 6.2 Auditing Process

The terms of reference for the audits must comprise the following:

- ❖ Develop a checklist against which the criteria can be referenced during the audit.
- ❖ During the audit process, key individuals involved with the management of the project are to be given the opportunity to comment on issues being audited and will be invited to accompany the auditor during the site inspection.
- ❖ Compile an audit report on the implementation of the EMPr and compliance to the Environmental Authorisation and submit this report to the competent authority (DEA&DP).

Compliance ratings against which the listed criteria are assessed are as follows:

Symbol	Rating	Interpretation
Y	Yes	Evidence of compliance
P	Partial	Evidence of partial compliance
N	No	Evidence of non-compliance
NR	Not Relevant	The condition or commitment is not relevant at this stage of the development or it is inappropriate
NA	Not Audited	Not audited

## 6.3 Non-Compliance

### Definition

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

- ❖ Any deviation by the Proponent from the environmental conditions and requirements as set out in the EA and EMPr – or,
- ❖ Any contravention by the Proponent 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 Proponent 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.

## 6.4 Issuing a Non-Compliance

Non-compliance may be issued to:

- ❖ The Proponent
- ❖ Any representative of the Proponent

## 6.5 Process of Issuing Non-Compliance

The appointed Environmental Control Officer (ECO) may issue a formal non-compliance to the Proponent. A copy of the non-compliance issued will be placed in the EMPr file. The Proponent 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.

## 6.6 Failure to complete corrective actions

In the event that the Proponent 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 Proponent.

The Proponent 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 Proponent or any of his staff.

On receiving a notice of non-compliance, the Proponent 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 Proponent's account.

The imposition of such a penalties / fine 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.

## 6.7 Unlawful Activity/ies

NEMA and its Regulations entitle environmental authorities to administer a fine not exceeding R5 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.

## 7. AMENDMENTS TO THE EMPr

This EMPr outlines the environmental practices and mitigation measures to be adhered to during the construction and rehabilitation phases (including all maintenance works) 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.

## 8. 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.

## 9. ENVIRONMENTAL MANAGEMENT PROGRAMME

### 9.1 CONSTRUCTION PHASE

Activity	Management / Mitigation	Responsibility	Frequency / Timing
<b>Authorisations, Licences and Permits</b>	<b>Environmental Authorisations</b>		
	<p>All necessary authorisations, permits and licences must be obtained by the Proponent prior to the start of the construction phase. The following authorisations and permits are relevant to this development:</p> <ol style="list-style-type: none"> <li>1. Environmental Authorisation – Department of Environmental Authorisation and Development Planning.</li> <li>2. Protected plant removal – Forestry Department.</li> <li>3. Construction permits.</li> </ol>	Proponent	Once-off
<b>Appointment of Environmental Control Officer</b>	<b>Appointment of Environmental Control Officer</b>		
	An Independent ECO must be appointed at the Proponent's cost to monitor the implementation of the EMPr.	Proponent & ECO	Once-off
	The nomination of the ECO must be given to DEA&DP, in writing within (7) seven days of appointment. The notification must include contact details for the ECO and details pertaining to the ECO's relevant experience.		
Should the ECO for the development change at any time, this must be		As required	

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	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.		
<b>Preparation of Method Statements</b>	<b>Method Statements</b>		
	Method Statements must be submitted by the Proponent to the ECO and must be adhered to by the Proponent. These relate to water and stormwater management requirements, solid waste management requirements, the storage of hazardous materials (if applicable), and standard emergency procedures.	Proponent	Once-off
	The ECO will monitor the implementation of the Statements.	ECO	On-going
<b>Notifying Relevant I&amp;APs</b>	<b>Notice of Environmental Authorisation (EA)</b>		
	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.	Proponent	Once-off



Activity	Management / Mitigation	Responsibility	Frequency / Timing
<p><b>Education of Site Staff on General and Environmental Conduct</b></p> <p><i>A general regard for the social and ecological wellbeing of the site and adjacent areas is expected of the site staff.</i></p>	<b>Environmental Awareness and Training</b>		
	<p>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.</p>	ECO	Once-off and as required
	<p>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.</p> <p>The training must take into account language and literacy requirements as well as measures to determine the effectiveness of the training.</p> <p>Proof of training must be attached to the ECO's audit reports.</p>		
	<p>Consideration of the implications of the EA and EMP must form part of the formal site induction for all contractors, sub-contractors and casual labourers, preferably in their native language.</p> <p>The induction training will, as a minimum, include the following:</p>		

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	<ul style="list-style-type: none"> <li>➤ The importance of conformance with all environmental policies;</li> <li>➤ The environmental impacts, actual or potential, of their work activities;</li> <li>➤ The environmental benefits of improved personal performance;</li> <li>➤ 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</li> <li>➤ The mitigation measures required to be implemented when carrying out their work activities.</li> </ul>		
	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 sensitized to any potential hazards associated with their tasks.	Proponent	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.	ECO &	

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	<p>shouting, hooting.</p> <p>All employees must undergo the necessary safety training and wear the necessary protective clothing at all times.</p> <p>No alcohol / drugs to be present on site; no vehicles or machinery are to be operated whilst under the influence of alcohol or drugs.</p> <p>No firearms allowed on site or in vehicles transporting staff to / from the site (unless used by security personnel).</p> <p>No unsocial behaviour will be permitted.</p> <p>Bringing pets onto site is forbidden.</p> <p>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).</p> <p>No fires to be permitted on site.</p> <p>Trespassing on private / commercial properties adjoining the site is forbidden.</p> <p>No worker may be forced to do work that is potentially dangerous or for what he / she is not so trained</p> <p>The staff conduct rules are described in a separate table of rules in the EMPr.</p>	Proponent	

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	This is aimed at providing staff with the basic information regarding worker conduct on site.		
<b>Site Management</b>	<b>Access</b>		
	No vehicles may drive onto the adjacent properties and any other no-go areas.	Site Manager	On-going
	<b>Site Management</b>		
	Adequate drainage and erosion protection must be provided around the site and where necessary. This can be in the form of sand bags and/or silt fence traps.	Site Manager	On-going
Access points and other cleared surfaces must be dampened whenever necessary and especially in dry and windy conditions to avoid excessive dust. Alternatively, a non-chemical binding product could be used.			
<b>Sewage and Sanitation</b>	<b>Ablutions</b>		
	Toilets must be positioned in an appropriate place, also taking into consideration, gradient of the land. Such facilities, which shall comply with local authority regulations, shall be maintained in a clean and hygienic condition. Their use shall be strictly enforced.	Site Manager	Immediately & on-going
	The Site Manager must ensure that toilets are cleaned regularly.		On-going

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	<p>Unauthorised spilling of waste from temporary toilets into the environment and burying of waste are strictly prohibited.</p>		
	<p>Ablution facilities must not cause any pollution to any water resource and it must not be a health hazard to the general public.</p>		
<b>Social Impacts</b>	<b>Communication Between Site Manager, Site Staff and I&amp;APs</b>		
	<p>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 Proponent/ Site Manager.</p>	Site Manager	On-going
	<p>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.</p>		
<p>Drivers of heavy-duty vehicles must exercise care when travelling to and from the site – and adhere to all legally enforceable requirements.</p>			
<b>Equipment lay-down and storage</b>	<b>Storage Areas</b>		
	<p>Choice of location for equipment lay-down and storage areas must take into account prevailing winds, general on-site topography and water erosion potential of the soil. Impervious surfaces, bunded areas or drip trays must be provided where necessary.</p>	Site Manager	On-going
<p>Equipment lay-down and storage areas must be designated to areas that will</p>			

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	be developed, demarcated and sign-posted.		
<b>Conservation of the Natural Environment</b>	<b>Erosion and Stormwater Control</b>		
	Land clearance must only take place in areas that will be developed.  Areas outside of the development footprint must be treated as “no-go” areas.	Site Manager	Immediate and on-going
	Soil disturbance during the removal of alien invasive plants must be minimised as much as possible.		Throughout the duration of the project
	Storm water control must be undertaken to prevent soil loss from the site.		Immediately
	Erosion prevention and control measures must be implemented. This may be by the use of mulch bags or silt fences.		On-going
	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.		
	Earth, stone or rubble is to be properly disposed of so as not to obstruct natural water pathways over the site.		

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	<b>Fauna and Flora</b>		
	Areas which are identified by the Environmental Control Officer (ECO) as being ecologically sensitive and which are 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.	ECO & Site Manager	Immediately
	No natural vegetation may be cleared without prior permission from the ECO and if applicable from any relevant authority. 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 during rehabilitation.		On-going
	The ECO must identify and make known to the team all Red Data listed vegetation species. All permits for the removal/ translocation of the identified protected vegetation species must be obtained prior to any ground clearance from the Department of Agriculture, Forestry and Fisheries (DAFF).		On-going
	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.	ECO & Site Manager	Immediate and On-going
	Disturbance to birds, animals and reptiles and their habitats must be minimized wherever possible.	Site Manager	

Activity	Management / Mitigation	Responsibility	Frequency / Timing
<b>Waste Management</b>	<b>On-Site Waste Management</b>		
	The excavation and use of rubbish pits is forbidden.	Site Manager	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.		
	All waste generated during operation is to be disposed of at a facility registered in terms of section 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008).		
<b>Handling of Hazardous Materials (if necessary)</b>	<b>Hazardous Materials</b>		
	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	Site Manager	On-going



Activity	Management / Mitigation	Responsibility	Frequency / Timing
	available, MSDSs must additionally include information on ecological impacts and measures to minimize negative environmental impacts during accidental releases or escapes.		
	Cement and other potential environmental pollutants must be stored within an impermeable bunded, roofed and sign posted area.		
	Cement and other potential environmental pollutants must be mixed on an impermeable surface that is bunded to prevent the leakage of pollutants onto the ground (if necessary).		
	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.		
<b>Cultural Environment</b>	<b>Archaeology and Artefacts</b>		
	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	Immediate and On-going
If any archaeological sites/materials are exposed, mitigation regarding the			

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	finds must be conducted with Heritage Western Cape regarding the destiny of the material.		
	If Heritage Western Cape agrees to the removal of the material, an archaeologist must apply for a permit from Heritage Western Cape to scientifically excavate/collect the material.		
<b>Safety and Security</b>	<b>Safety and Security On-Site</b>		
	Material stockpiles or stacks must be stable and well secured to avoid collapse and possible injury to site workers / local residents.	Site Manager	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.		
	Vehicle speeds shall not exceed 40km/h along dust roads or 20km/h when traversing unconsolidated and non-vegetated areas		

## 9.2 REHABILITATION AND MAINTENANCE

**\*All rehabilitation measures must be implemented with consultation with a Biodiversity Specialist**

Activity	Management / Mitigation	Responsibility	Frequency / Timing
<b>Vegetation Rehabilitation</b>	<b>Vegetation</b>	Proponent, Site Manager & ECO	On-going site maintenance
	A 100% indigenous planting plan must be adhered to in terms of all planting carried out on the site.		
	Erosion prevention and control measures must be fully implemented (if necessary).		
	All rehabilitated areas must be maintained through weekly inspections until the 80% success rate has been achieved (if applicable).		
	Encroachment of invasive alien plants in this regard will need to be monitored on a regular basis to prevent re-infestation.		
<b>Stormwater Management</b>	<b>Stormwater</b>	Proponent & Site Manager	On-going site maintenance
	Any negative stormwater effects, related to the operational phase, must be remediated.		
	On-going monitoring and assessing of stormwater drainage must occur on site during the operational phase of the proposed project.		

## 5. 10. ALIEN PLANT CONTROL PROGRAMME

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

### **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.**

### **10.1 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.



## 10.2 Top 10 Alien Vegetation Affecting the Western Cape (Cape Nature, *Alien vegetation management*, 2016)



COMMON NAME	BOTANICAL NAME	PLANT TYPE	CATEGORY	IDENTIFICATION
Australian myrtle	<i>Leptospermum laevigatum</i>	Tree	1	

Black wattle	<i>Acacia meansii</i> (Fabaceae)	Tree	2	
Blackwood	<i>Acacia melanoxylon</i>	Tree	2	



Cluster pine	<i>Pinus pinaster</i>	Tree	2	
Long-leafed wattle	<i>Acacia longifolia</i>	Shrub	1	

Port Jackson	<i>Acacia saligna</i>	Tree	1	
Rooikrans	<i>Acacia cyclops</i>	Shrub/ tree	1	

Silky hakea	<i>Hakea sericea</i>	Shrub	1	
Spider gum	<i>Eucalyptus conferruminata</i>	Tree	1	

Stinkbean	<i>Paraserianthes lophantha</i> (Fabaceae)	Shrub/tree	1	
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## 10.3 Ways to Eradicate Alien Vegetation

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

### Step 1

The first step of the 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 Alien Invasive Species 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.

#### Mechanical Methods

##### *Hand-pulling*

This method of removal is only really an option during the summer months and when the alien plant species 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 alien plant species 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.

### **Chemical Methods**

The use of chemicals in controlling and removing of alien plant species should not be excluded as a possible option. Once the alien plant species 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.

### **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.

### **Disposal of Alien 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.

## 6. 11. Species Planting List

Please consult with a Botanical specialist for a comprehensive list.



## 12. STAFF CONDUCT CONTROL AND INFORMATION SHEET

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

### 13. RESPONSIBILITIES

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

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

**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 AND ASSOCIATED INFRASTRUCTURE ON A PORTION OF RE/155, KEURBOOMSTRAND, PLETTENBERG BAY**

**DEA&DP Reference: 16/3/3/6/7/1/D1/6/0126/20**

**PROPONENT:**

Signed: ..... Date: .....

**SITE MANAGER:**

Signed: ..... Date: .....

**ENVIRONMENTAL CONTROL OFFICER**

Signed: ..... Date: .....

## 7. Appendix A: CV of the EAP