PROPOSED CAPE INFANTA RESIDENTIAL DEVELOPMENT ON A PORTION OF ERF 134, INFANTA

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

10 November 2025

Prepared for: Westerhelling Investments cc

Prepared by: PHS Consulting

DEA&DP Reference: 16/3/3/6/7/1/E3/6/1456/25 (Pre-application Phase)

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NOTE: THIS EMPR IS BASED ON PREVIOUS VERSIONS OF THE EMPR USED FOR PUBLIC PARTICIPATION AND INCORPORATES STAKEHOLDER COMMENT AND SPECIALIST INPUT

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TABLE OF CONTENTS

LIST OF APPENDICES

EMPr REQUIREMENTS IN TERMS OF NEMA

REQUIREMENT	DESCRIPTION
(a) Details of the EAP who prepared the EMPr; and	Refer page 2.
(b) The expertise of the EAP to prepare an EMPr, including a curriculum vitae.	Refer page 2 & Appendix F.
(c) A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description.	Section 3
(d) 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.	Appendix B3
(e) A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all the phases of the development including – (i) Planning and design; (ii) Pre-construction activities; (iii) Construction activities; (iv) Rehabilitation of the environment after construction and where applicable post closure; and (v) Where relevant, operation activities.	Section 6 – Environmental Impacts and Mitigations Section 7 – Roles and Responsibilities Section 10 – Management and Monitoring Procedures Section 11 – Impact Management Outcomes and Actions
(f) A description of the proposed impact management actions, identifying the manner in which the impact management outcomes contemplated above will be achieved and must, where applicable include actions to – (i) avoid, modify, remedy control or stop any action, activity or process which causes pollution or environmental degradation; (ii) comply with any prescribed environmental management standards or practises; (iii) comply with any applicable provisions of the act regarding closure, where applicable; and	Section 6 – Environmental Impacts and Mitigations

REQUIREMENT	DESCRIPTION
(iv) comply with any provisions of the act regarding financial provisions for rehabilitation, where applicable.	
(g) The method of monitoring the implementation of the impact management actions contemplated above.	Section 10 – Management and Monitoring Procedures Section 11 – Impact management Outcomes and Actions Section 12 – Compliance with Environmental Requirements
(h) The frequency of monitoring the implementation of the impact management actions contemplated above.	Section 8 – Monitoring
(i) An indication of the persons who will be responsible for the implementation of the impact management actions.	Section 7 – Roles and Responsibilities
(j) The time periods within which the impact management actions must be implemented.	Section 11 – Impact management Outcomes and Actions
(k) The mechanism for monitoring compliance with the impact management actions.	Section 8 - Monitoring
(l) A program for reporting on compliance, taking into account the requirements as prescribed in the Regulations.	Section 8 - Monitoring
(m) An environmental awareness plan describing the manner in which – (i) The Applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment.	Section 7 – Roles and Responsibilities Section 8 - Monitoring Section 10 – Management and Monitoring Procedures Section 11 – Impact Management Outcomes and Actions
(n) Any specific information that may be required by the competent authority.	None

DEFINITIONS

In this EMPr any word or expression to which a meaning has been assigned in the NEMA or EIA has that meaning, and unless the context requires otherwise –

Alternatives	Different mechanisms for achieving the general purpose and need of the proposed activity or development. Alternatives may be in terms of location, activity, processes, timing, or "do nothing" (i.e. "no-go" option).
Applicant	The person applying for Environmental Authorisation or carrying out the activity. The person or legal entity that has made application to the competent authority for environmental authorizations and who will have the overall responsibility to adhere to the relevant legislation and comply with the environmental authorization.
Assessment	The evaluation, judgement, organising, rating, interpreting and communicating information which is relevant.
Biota	The animal and plant life of a particular region, habitat or ecosystem.
Construction activity	Any action taken by the Contractor, his subcontractors, suppliers or personnel in undertaking the construction work, otherwise referred to as "Works"
Construction area(s)	All areas used by the Contractor in order to carry out the required construction activities. This includes all offices, accommodation facilities, testing facilities / laboratories, batching areas, storage & stockpiling areas, workshops, spoiling areas, access roads, traffic accommodation (e.g. bypasses), etc.
Ecosystem	A biological community of interacting organisms (plants and animals) and their physical environment.
Endangered species	A species of plant or animal which has been categorised by the International Union for Conservation of Nature (IUCN) Red Data List as likely to become extinct.
Endemic	A plant or animal species that is native or restricted to a certain area or range.
Environment	The surroundings within which humans exist and that are made up of - • land, water and atmosphere; • micro-organisms, plant and animal life; • any part or combination of the above and the interrelationships among and between them; • the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.
Environmental Authorisation	The permission required from the competent authority for an activity as listed according to the NEMA Regulations, 2014 (as amended).
Environmental Impact	Any change to the environment, whether desirable or undesirable, that would result directly or indirectly from any construction activity.

Environmental Management	Ensuring that environmental concerns are included in all stages of development in order to ensure that the proposed activity or development is done in a sustainable manner and does not exceed the carrying capacity of the surrounding local environment.
Hazardous material / substances	Any waste that contains organic or inorganic elements or compounds, that may, owing to its inherent physical, chemical or toxicological characteristics, have a detrimental impact on health and the environment.
Indigenous	A "native" species of plant or animal that occurs naturally in a particular place or region and was not artificially or intentionally introduced.
Invasive Alien Plants	All undesirable vegetation, defined as but not limited to, all declared category 1 and category 2 plants in terms of the National Environmental Management: Biodiversity Act, 2014 (Act No. 10 of 2004), as amended.
Local Authority	Otherwise referred to as the "Council" – the local municipal authority that operates or is responsible in said area.
Rehabilitation	Returning an area impacted by activities/works to its original or better condition prior to the impacts from the activities/works having occurred.
Significant impact	An impact that may, but its magnitude, duration, intensity, or probability, have a notable effect on one or more aspects of the environment.

ACRONYMS

BOCMA	Breede- Olifants Catchment Management Agency
DEA&DP	Department of Environmental Affairs and Development Planning
DWS	Department of Water & Sanitation
EA	Environmental Authorisation
ECO	Environmental Control Officer
EMPr	Environmental Management Programme
EMP	Environmental Management Plan
ER	Employer's Representative
HWC	Heritage Western Cape
I&AP	Interested and Affected Party
MS	Method Statement
MSDS	Material Safety Data Sheet
NEMA	National Environmental Management Act (Act No. 107 of 1998) as amended
NEM: WA	National Environmental Management Waste Act (Act No. 59 of 2008), as amended
NHRA	National Heritage Resources Act (Act No. 25 of 1998)
NWA	National Water Act (Act 36 of 1998), as amended
PPC&E	Personal Protective Clothing and Equipment

1. INTRODUCTION

An Environmental Management Plan (EMPr) describes mitigation measures in detail, and is prescriptive, identifying specific individuals responsible for undertaking specific tasks to ensure that impacts on the environment are minimized during construction, operational and related activities. As an open – ended document, information gained during on-going monitoring of procedures on site could lead to changes in the recommendations and specifications of this document. This document forms an agreement between the Department of Environmental Affairs and Development Planning (DEA&DP) and the Applicant that the environmentally sensitive features on the site will be suitably protected during the lifespan of the activity through the implementation of the applicable mitigation measures.

Note: this EMPr is based on previous versions that have been through extensive PPP.

The content of this EMPr must contain the information set out in **Appendix 4** of the NEMA EIA Regulations, 2014 (as amended) – which is listed on page 8 of this report. This EMPr contains management requirements and recommendations made by PHS Consulting, specialists, and stakeholders during previous rounds of public participaiton, as well as in terms of best practice. This EMPr should be reviewed and updated to include any additional recommendations that arise from the BA process, as well as any conditions of authorisation should the project be authorised.

The Applicant must ensure that this EMPr forms part of any contractual agreements with a Contractor(s) and sub-contractors for the execution of the proposed project. The Contractor must make adequate provision in their budgets for the implementation of the EMPr.

It is the responsibility of the Applicant to undertake the following:

- Ensure that all requirements of the EMPr are met for the duration of the construction works. The Applicant or holder of the EA always has the ultimate responsibility to ensure compliance in South African law.
- Appoint an Environmental Control Officer (ECO) to monitor the implementation of the construction phase of the EMPr, where required to do so by DEA&DP. Appoint an ECO to monitor any other aspects covered in this document or its Appendices that expressly calls for an ECO to be involved.
- Bind any and all contractors undertaking work on these sites, to the specifications in this same EMPr, as well as Appendices and any amendments thereto.

1.1. PURPOSE OF THIS EMPr

The purpose of this EMPr is to ensure that the environmental impacts and management of the various phases of the proposed development on the receiving environment are managed, mitigated and kept to a minimum (i.e. the **outcome** of implementing the EMPr). The EMPr must provide easily understood and clearly defined **actions** that must be implemented during each phase of the development of the proposal. The EMPr is a dynamic document that is flexible and responsive to new and changing circumstances.

The document is binding on the Applicant, all contractors and sub-contractors and visitors to the site. It must be included as part of any tender documents / agreements, as well as contractual documents between the Applicant and any contractors. Copies of this EMPr must be kept on site and all **senior personnel** are expected to familiarise themselves with the content of this EMPr.

Any amendments to the approved EMPr must first be approved by DEA&DP before the revised EMPr can come into force.

1.2. STATUS OF THIS EMPr

It is of utmost importance that this EMPr be read in conjunction with any legally obtained authorisations such as an EA of WULA. This EMPr is viewed as a dynamic document that must be reviewed and updated on a continual

basis. The EMPr is valid for the duration of the project with each applicable phase corresponding to the identified requirements.

2. EMPr PHASING

2.1. PLANNING, DESIGN AND PRE-CONSTRUCTION PHASE

The planning, design and pre-construction phase refers to the pre-development phase of the project. This will ensure that any requirements and best practise mechanisms are built into the planning or design phase to be developed in the construction and operational phase.

2.2. CONSTRUCTION PHASE

The construction phase refers to the actual construction activities associated with the development on the property and includes all earthworks, building, and installation of bulk services (i.e. water, sewerage, roads, stormwater, electricity etc.).

2.3. OPERATIONAL PHASE

The operational phase refers to the working activities and commences once the construction activities on new developments are completed. In case of this development the construction phase of this development will be completed once the installation of the services infrastructure is completed.

Various aspects of the proposed development will also require routine maintenance and management to be carried out throughout the operation period. These include servicing of stormwater attenuation facilities, clearing of alien vegetation and maintaining areas of public open space.

The HOA must ensure that the Operational Phase maintains the underpinning principles 'Duty-of-Care-to-the-Environment' and ideals of sustainable development.

2.4. CONSTRUCTION OF INDIVIDUAL HOUSES

The construction of individual houses must adhere to the requirements of the House Construction Environmental Management Plan (CEMP). The individual homeowners must comply with the House CEMP, and the HOA must oversee compliance with the House CEMP.

A copy of the House CEMP must be issued to each builder at the tender stage to allow for costs of implementing the conditions of this House CEMP to be included in the building costs. This will also ensure that each builder is aware of his responsibilities prior to commencing work.

Copies of the House CEMP must be available to each Site Foreman, who will be required to familiarize him/herself with the contents of the document and ensure that procedures are followed accordingly.

Each Builder will be contractually bound to abide by the specifications of the House CEMP, as well as Appendices and any amendments thereto.

The House CEMP included under **Appendix H** of this EMPr.

2.5. CLOSURE AND DECOMMISSIONING PHASE

Decommissioning refers to the process of removing the operating assets of any development after completion of the operating life cycle.

Decommissioning must be done in accordance with the principles described in this EMPr. Where possible materials should be reused or recycled. Alternatively, if this is not possible, they should be disposed of at an appropriately licensed waste facility. The areas affected by activities should be rehabilitated and re-vegetated with suitable indigenous vegetation.

3. DESCRIPTION OF THE PROPOSED DEVELOPMENT

The development proposal includes the proposed construction of 15 single and 5 double storey residential units (as well as the associated roads and service infrastructure) on a 3.04ha portion of Erf 134, 85ha in extent, at Cape Infanta, with each residential unit having its own sewage package plant and 55% of the site being set aside for open space. Only 22% of the 3.04ha of Erf 134 will be coverage or be within the building footprint. The remainder of the site (81.9ha), which is located to the South of the District Road 268 leading into Infanta, will not be developed and will remain zoned Agriculture 1. The existing land uses on the property are dwelling house and indigenous vegetation.

Infanta is situated on a portion of the Potteberg Estate which consisted of a number of farms which were acquired by Anders Ohlsson in the early 1900s.The portion of land on which Infanta appears to have been established is Rietfontein. This land was subdivided from the Potteberg Estate in 1927. Plans were submitted in 1949 by Infanta Pty Ltd for a coastal village with a hotel and school. To date the settlement has remained predominantly a seasonal holiday destination.

The existing settlement of Infanta is comprised of two parts. The older historical settlement is located immediately to the South of the site and Infanta Park is located immediately to the West. The entire property lies within the jurisdiction of the Swellendam Local Municipality in the Overberg District Municipality of the Western Cape Province.

Planning application is being undertaken to prepare and submit the statutory land use application necessary for the subdivision and rezoning of Erf 134, at Cape Infanta to permit the construction of an additional 20 single dwelling residential units. The Cape Infanta Homeowners Association will take ownership and management of the private roads and private open spaces that are to be created.

PHS Consulting is undertaking the Environmental Impact Assessment as required in terms of the National Environmental Management Act (Act 107 of 1998) and the National Environmental Management Amendment Act (Act 62 of 2008) and has also been commissioned to draft the required EMPr for this proposed development.

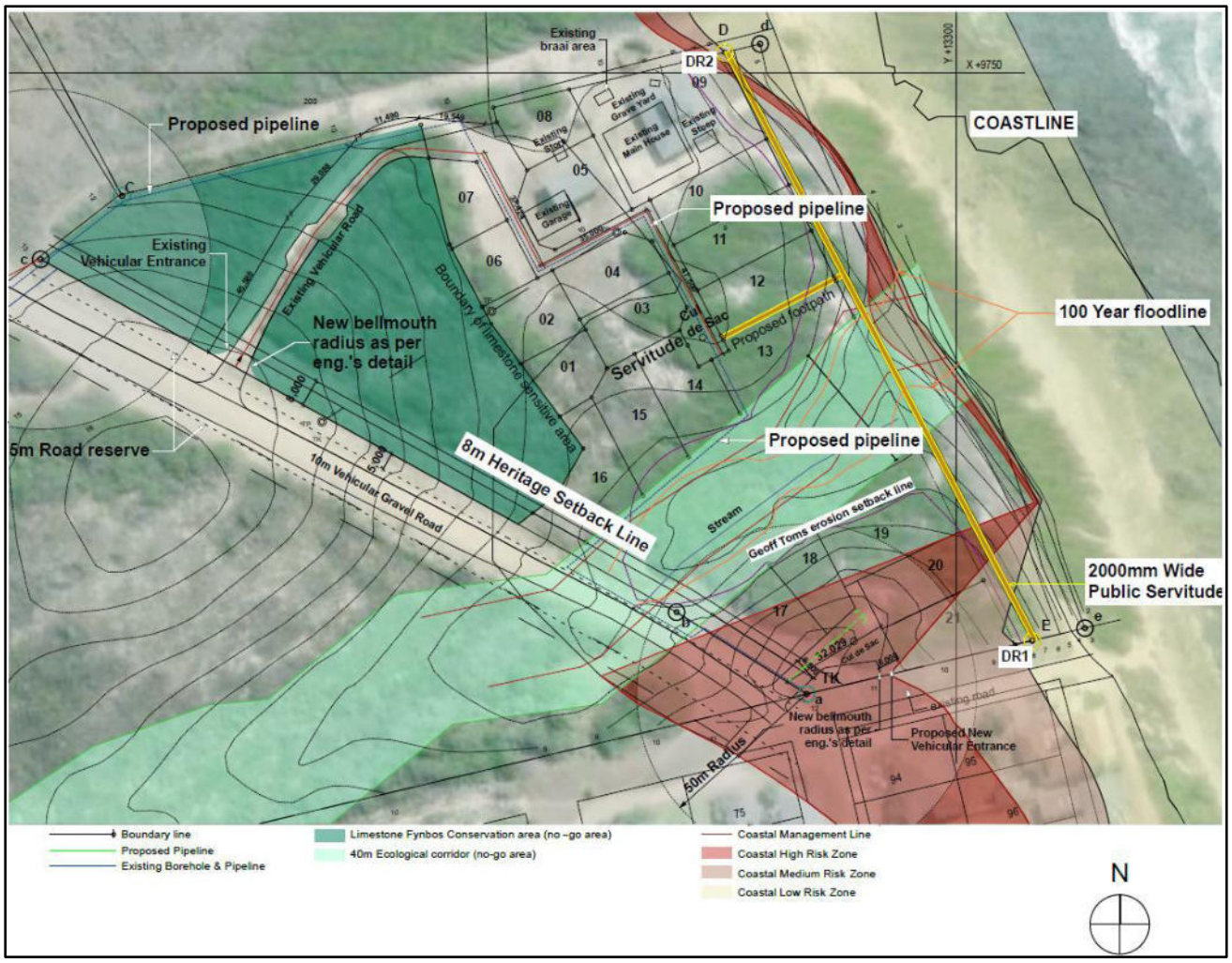


Figure 1: Site Development Plan (Refer to Appendix B)

3.1. LOCATION

Erf 134, Cape Infanta is located between the Infanta village (an orthogonal grid settlement adjacent to the coastline) and Infanta Park (a later suburban development), approximately 57km southeast of Swellendam and about 1km southeast of the Breede River mouth. Refer to **Figure 2** below.

The property is traversed by the main access road between Malgas and Infanta, District Road 268. The portion of Erf 134 lying East of the main road is the portion which is the subject of this planning application. The remainder of Erf 134 is not part of this application.

The proposed site measures 3,04ha and the larger property is 85,6ha in size and stretches from the Indian Ocean coastline in a westerly direction. The central coordinates for the Cape Infanta Residential Development are as follows: 34°25.131' S 20°51.201' E.

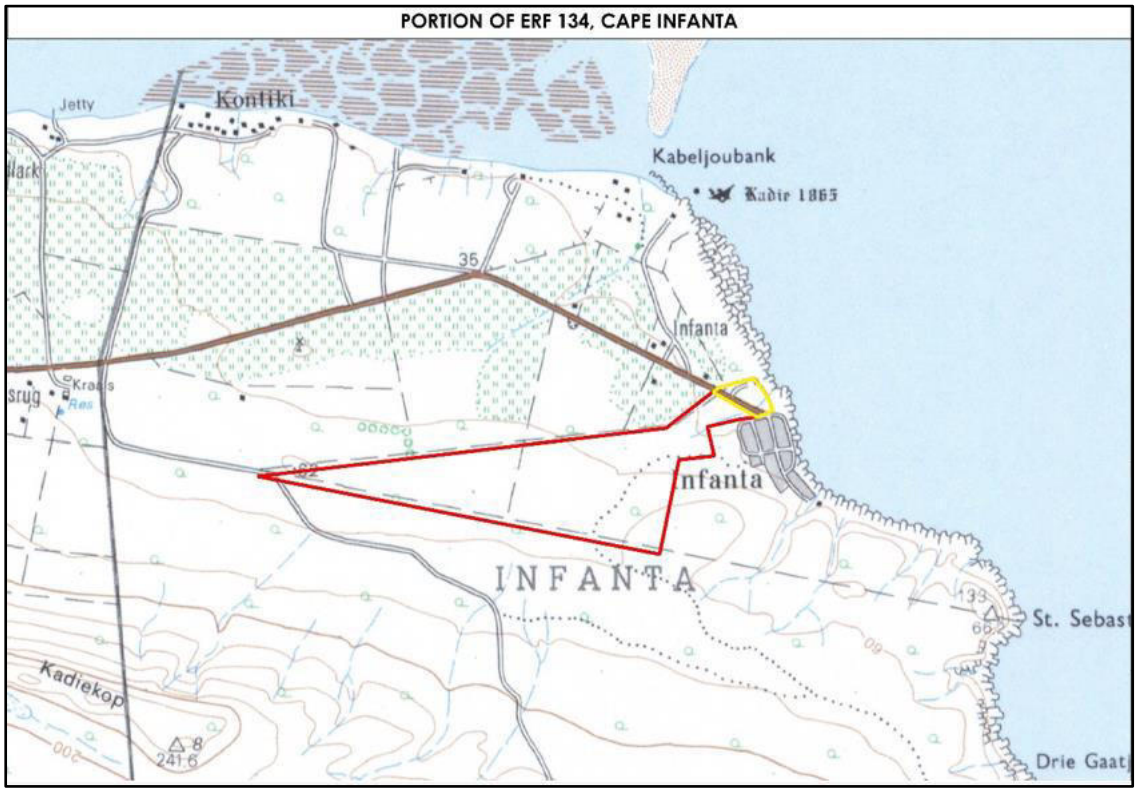


Figure 2: Site location (Erf 134 indicated by red outline and the proposed site indicated by yellow outline)

Details of the subject property is listed in **Table 1** below.

Table 1: Property details:

Erf name(s) and number(s)	Surveyor General (SG) 21-digit code
Erf 134	C07300040000013400000

3.2. SCOPE OF THE DEVELOPMENT

It is proposed to rezone a 3.04ha portion of Erf 134 from Agricultural Zone (AZ) to Subdivisional Area in terms of

Section 15(2)(a) of the Swellendam Municipal Planning Bylaw of November 2020. The following zonings are proposed for various portions of the site: Residential Zone 1(R1), Natural Resource Zone, Private Open Space (PrOS), Public Open Space, and Transport Zone (TZ) (Public Road) in terms of Section 3 of the Swellendam Municipality Integrated Zoning Scheme, June 2020, to permit the construction of an additional 20 single dwelling units in accordance with the proposed layout contained in this application. More than 53% of the land will remain in its natural form.

The proposed portion to be developed from here on, will be referred to as 'the site'. The remainder of the erf (81.9ha) that occurs to the West of the Infanta Main Road, will remain zoned for agriculture. This remainder of the erf does not form part of this application.

The areas to be rezoned are as follows:

Proposed Zone	**Size**	**Percentage of developable area**
Transport (TZ) (public road):	2 817.9m²	9%
Private Open Space (PrOS):	47m²	0.15%
Public Open Space	3 983m²	13%
Natural Resource Zone	12 113m²	39.8%
Residential 1(R1)	11 557m²	38%

The site is located within the demarcated urban edge of Infanta and has been earmarked for urban expansion, residential development. Consideration is therefore being given to the construction of 20 additional free standing single dwelling residential units, on the site. There is an existing dwelling on the site which will be incorporated into the development. 15 units will be single storey and 5 will be double storey. Each unit will have its own package plant to treat sewage.

3.2.1. Proposed Services

WATER SUPPLY

Water will be supplied from a dual source of both rainwater and borehole water. There is sufficient borehole water on the property if the existing borehole BH134C, is used. It is proposed that the harvesting of rainwater be used for potable water consumption. Each household will be required to have a $5m^3$ water tank for rainwater harvesting.

SEWER RETICULATION

It is proposed that each erf be fitted with an on-site WWTW Package Plant to handle the expected sewage flow. The factory built activated sludge sewage treatment plant will produce effluent that meets the DWS General Standards. According to the Manufacturer's (Maskam Water) design criteria the system consists over the following qualities:

- Odourless and quiet.
- The install is underground.
- Has a small footprint.

- Effluent meets the South African DWS General Standard.
- Includes nitrification and de-nitrification cycles.

The smallest available model is the ZF450 which has a capacity to treat 1,500ℓ/day which is well above the expected 640ℓ/day sewage flow per household. The water can be recycled for non-potable usage such as flushing toilets, with the remaining effluent being used for irrigation or being discharged underground to a soak-away. Alternatively, all the effluent can be discharged to a soak-away as the surrounding soil is sand and very porous.

SOLID WASTE MANAGEMENT DURING OPERATION PHASE

The expected volume of solid waste generated, for the specific development, will be seasonal. The highest volume of solid waste will be generated during the December-January period with other peaks around school holidays. Low volumes of waste will be generated during winter months. It is expected that between 0,15 to 0,25m³/household/week, solid waste, will be generated. Homeowners will be expected to deliver household solid waste to a Waste Transfer Station that will be located at one of the two entrances to the development. Swellendam Municipality will service the transfer station on Tuesday's and transport the un-compacted solid waste to the Swellendam Municipal Solid Waste Site. No treatment of waste to occur on site.

ELECTRICITY

Eskom supplies the area with a 22kV overhead line network. The formalised Infanta residential area has underground reticulation networks, whilst the various farms in the area are fed via an overhead line network. The development will be supplied from the existing 22kV overhead line network along the access road going into Infanta. The existing house is fed from a 25kVA pole transformer. This transformer will have to be upgraded to accommodate the required 115kVA. This electrical demand is based on 28 units, however, only 20 additional units are proposed. The low voltage distribution system will be supplied from the abovementioned transformer via underground copper cable supplying strategically positioned distribution kiosks.

3.2.2. Applicable Listed Activities

In terms of Section 24(5) and 44 of NEMA, the following Listed Activities requires authorisation:

Activity No(s):	Provide the relevant **Basic Assessment Activity(ies)** as set out in **Listing Notice 1**	Describe the portion of the proposed development to which the applicable listed activity relates.
12	The development of— i. dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or ii. infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs- a) within a watercourse; b) in front of a development setback; or c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; - excluding- aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; dd) where such development occurs within an urban area; ee) where such development occurs within existing roads, road reserves or railway line reserves; or ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.	Portions of a few of the residential units will be constructed within 32m of the watercourse on site. However, these buildings will be located outside the 1:100-year flood line and landwards of the proposed setback line.
19	The infilling or depositing of any material of more than 10m^3 into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10m^3 from a watercourse;	The potable pipeline, services installation and the walkway will cross the drainage line for installation, and this may require movement of more than 10m^3 material.

	but excluding where such infilling, depositing, dredging, excavation, removal or moving – (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case Activity 26 in Listing 2 of 2014 applies.	The potable line and the services installation is landward of the setback line determined by a specialist and is excluded from this listed activity.
19A	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from— (i) the seashore; (ii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater; or (iii) the sea; — but excluding where such infilling, depositing, dredging, excavation, removal or moving— (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance (c) management plan; (d) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (e) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.	$10m^3$ of material may be excavated, moved or infilled within 100m from the high-water mark (HWM) for the establishment of the walkway. A setback line has been determined by a specialist, and no construction activities will occur in front of this line, outside of the walkway.
27	The clearance of an area of 1 hectare or more, but less than 20 hectares of	More than 1ha of indigenous vegetation will be cleared for the proposed development.

	indigenous vegetation, except where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or maintenance purposes undertaken in accordance with a maintenance management plan.	
Activity No(s):	Provide the relevant **Basic Assessment Activity(ies)** as set out in **Listing Notice 3**	Describe the portion of the proposed development to which the applicable listed activity relates.
4	The development of a road wider than 4 metres with a reserve less than 13,5 metres. i. Western Cape i. Areas zoned for use as public open space or equivalent zoning; ii. Areas outside urban areas; (aa) Areas containing indigenous vegetation; (bb) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined; or iii. Inside urban areas: (aa) Areas zoned for conservation use; or (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority.	The internal roads of the development will be constructed in areas that contain indigenous vegetation therefore this activity will be triggered.
12	The clearance of an area of 300m^2 or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. Western Cape (i) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; (ii) Within critical biodiversity areas identified in bioregional plans; (iii) Within the littoral active zone or 100m inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; (iv) On land, where at the time of coming into effect of this Notice or thereafter such land was zoned open	Clearance of vegetation will exceed 300m^2 within the area seaward of the setback line determined by a specialist.

	space, conservation or had an equivalent zoning; or (v) On land designated for protection or conservation purposes in an Environmental Management Framework adopted in the prescribed manner, or a Spatial Development Framework adopted by the MEC or Minister.	

4. DESCRIPTION OF THE RECEIVING ENVIRONMENT

4.1. GROUNDWATER

Measurement of groundwater levels in the vicinity of Erf 134 Infanta indicated groundwater levels are in the order of 2 to 11m below ground level. As expected, groundwater levels are shallower along the coastline. The area surrounding Erf 134 Infanta consists of the fractured secondary Table Mountain Group aquifer. These aquifers are classified as major aquifers. Major aquifers as highly permeable formations with known or probable presence of significant fracturing. Such aquifers may be highly productive and able to support large groundwater abstraction.

Two boreholes (134A and 134C) are located on Erf 134. A 72-hour pumping test on borehole 134C (Van Biljon, 2014) confirmed a sustainable yield of 25m³/day, with a maximum of 48m³/day under optimal conditions. This yield exceeds the development's estimated potable demand of 16.8m³/day (≈ 6,312m³/a). Including provision for firefighting, the total annual water demand is estimated at 7 665m³/a (21m^3/day).

Borehole BH134C at the site was tested in June 2020 with a 48-hour pumping program, including a Stepped Discharge Test, Constant Discharge Test, and Recovery Monitoring, to assess its productivity and aquifer properties. The tests determined the sustainable yield, calculated using the FC-Method, at 32.4m³/day (11 826m³/year). Water quality analysis showed elevated salinity (Na, Cl, EC, TDS) typical of the Bokkeveld Group and total coliforms above operational limits, indicating microbial contamination from soil. The borehole can supply sufficient water for the development but requires treatment for potable use.

4.2. SURFACE WATER

A small ephemeral stream crosses the property, entering Erf 134 along its south-eastern border. The stream flows along the southern portion of the property before entering the sea. The stream lies in the Breede River catchment and Breede River Water Management Area.

In terms of both riparian and instream integrity, the stream is considered to be a Category A (natural) stream, as there is no significant abstraction of water from the stream, little modification to the channel and stream bed, and the surrounding vegetation is largely intact, with the exception of the section of stream flowing through Erf 134.

In terms of ecological importance and sensitivity, only the abiotic component could be assessed, placing the stream in the 'high' category. Due to its ephemeral nature, the stream is highly sensitive to changes in water quantity and quality, as any change will alter the characteristics of the stream. The stream is not highly important in terms of the provision of aquatic or semi-aquatic habitat, or as refuge for aquatic and semi-aquatic fauna and flora, due to the fact that the stream corridor is primarily a terrestrial feature, except during the days when there is flow in the stream.

In summary, the PES of the stream is Category A, while the ecological management class for the stream is Class B. Future development in the stream's catchment and management of the stream must ensure that the stream remains in its current state, with no deterioration in management class. Overall, the stream can be considered to be of very high conservation importance. Due to the largely terrestrial nature of the stream corridor, it is important to also consider the conservation importance of the surrounding dunes and vegetation, and the requirements of any fauna that may use the stream corridor for dispersal, refuge, etc.

The development provides for a sufficient wide (40m) corridor around the watercourse. The establishment of such a corridor will protect the watercourse/stream and the surrounding dunes that contribute runoff to the stream during rainfall.

4.3. BIODIVERSITY

The National Freshwater Ecosystem Priority Areas (NFEPA) project provides strategic spatial priorities for conserving South Africa's freshwater ecosystems and supports sustainable use of water resources. These priority areas are called Freshwater Ecosystem Priority Areas, or 'FEPAs'. The NFEPA wetland map therefore identifies important or sensitive wetlands and wetland clusters. However, the freshwater specialist did identify a stream on site. The stream is classified as an ecological support area in terms of the Western Cape Biodiversity Spatial Plan.

Two vegetation types are shown for the area namely Overberg Dune Strandveld and De Hoop Limestone Fynbos. Neither Overberg Dune Strandveld nor De Hoop Limestone Fynbos is listed in the National List of Threatened Ecosystems.

A critical biodiversity area has been identified for the western corner of the site, while the stream corridor is classified as an ecological support area.

The western corner of the site has been demarcated as a Limestone Fynbos Conservation area and will be demarcated as a no-go area. A sufficient wide (40m) corridor around the watercourse is provided for in the development layout.

4.4. HERITAGE RESOURCES

There are only two structures built on the property, a modern house with a dominant central lantern, and an unattached garage. There are thus no built structures on the site which could be considered to have heritage significance.

Provision has been made for a landscaped strip of land adjacent to the main access road of approximately 8 metres, with guidelines to ensure appropriate boundary walls and to ensure that the immediately adjacent erven do not present their rear elevations to the main access road into the village. An aspect of this landscaped strip should be the retention of the high point of the site, at the southern tip and immediately adjacent to the existing residential area to the south-east as a natural green area. Further, sufficient set-back lines should be established along the natural drainage feature to ensure sufficient views across the site to the sea.

The archaeological report states that due to the prevailing sandy conditions and the pre-colonial signature on the landscape there is the possibility that precolonial burials could be located within the development footprint. As burials may be present, the necessary protocols should be in place for dealing with the remains, particularly during the construction phase of the project.

4.5. SOCIO/ ECONOMIC ASPECTS

The village of Infanta is located within Ward 3 of the Swellendam Local Municipality (SLM). Ward 3 includes a large area, in which the Infanta area is anomalous in that the majority of homes are holiday homes owned by people that live outside of the SLM.

The demographic data should therefore be viewed within the context that the coastal village of Infanta is essentially a small holiday village with a small permanent population, which represents a small percentage of the total population of Ward 3 and the SLM. The majority of homeowners are White and likely to be better educated and fall in a higher income bracket than the majority of the population of Ward 3 and the SLM.

4.6. VISUAL CHARACTER AND SENSE OF PLACE

The construction of the individual houses will be aligned with the architectural guidelines included in the draft BASIC Assessment Report.

5. LEGISLATIVE REQUIREMENTS

The Applicant / Holder of the EA is required to comply with all necessary legislation and policies applicable to development and management of the development. These include but are not limited to:

5.1. THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA, 1996 (ACT NO. 108 OF 1996)

The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) states that everyone has a right to a non-threatening environment and that reasonable measures are applied to protect the environment. This includes preventing pollution and promoting conservation and environmentally sustainable development, while promoting justifiable social and economic development. The underpinning principles of NEMA's Duty of Care section reflects these principles of the Constitution.

5.2. THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998)

NEMA makes provision for the identification and assessment of activities that are potentially detrimental to the environment, and which require authorisation from the competent authority (in this case, DEA&DP) based on the findings of an EIA.

NEMA embraces the notion of sustainable development as contained in the Constitution of South Africa (Act 106 of 1996) in that everyone has the right:

- to an environment that is not harmful to their health or wellbeing; and
- to have the environment protected for the benefit of present and future generations through reasonable legislative and other measures.

NEMA aims to provide for cooperative environmental governance by establishing principles for decision-making on all matters relating to the environment and by means of Environmental Implementation Plans (EIP) and Environmental Management Plans/Programmes (EMPr), of which this CMP is one.

Principles contained in Section 2 of the NEMA, amongst other things, prescribe that environmental management must:

- In order of priority aim to avoid, minimise or remedy disturbance of ecosystems and loss of biodiversity;
- Avoid degradation of the environment and avoid jeopardising ecosystem integrity;
- Pursue the best practicable environmental option by means of integrated environmental management;
- Protect the environment as the people's common heritage;
- Control and minimise environmental damage; and
- Pay specific attention to management and planning procedures pertaining to sensitive, vulnerable, highly dynamic or stressed ecosystems.

It is incumbent upon the Applicant to ensure that the abovementioned principles, entrenched in this EMPr are upheld and complied with.

5.3. THE NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008 (ACT NO. 59 OF 2008)

The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM: WA) deals with the handling, depositing, treatment, processing, recycling, re-use and/or storage of both "general" and "hazardous" waste products. This Act was assented by the President on 10 March 2009 and enacted on 3 July 2009. Subsequently all waste related activities are omitted from NEMA and must be authorized in terms of NEM: WA.

The proposed development will produce hazardous and general waste, and the management of waste is further discussed in Section 11. It has been confirmed that waste items that are re-used as a different primary product are considered to be products and not waste.

In terms of NEM: WA, a Waste License is not required.

5.4. THE NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT, 2004 (ACT NO. 10 OF 2004)

The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA) controls the management and conservation of South African biodiversity within the framework of NEMA. Amongst others, it deals with the protection of species and ecosystems that warrant national protection, as well as the sustainable use of indigenous biological resources. Sections 52 & 53 of this Act specifically make provision for the protection of critically endangered, endangered, vulnerable and protected ecosystems that have undergone, or have a risk of undergoing, significant degradation of ecological structure, function or composition as a result of human intervention through threatening processes.

The National List of Threatened Ecosystems (Notice 1477 of 2009, Government Gazette No. 32689, 6 November 2009) was gazetted in 2014. The 2011 list was later replaced by a revised list published on 18 November 2022 (Notice No. 689 in Gazette No. 47526). The list of threatened terrestrial ecosystems supersedes the information regarding terrestrial ecosystem status in the National Spatial Biodiversity Assessment (NSBA) 2004 & 2011.

A portion of the development will fall within a Critical Biodiversity Area and an Ecological Support Area.

5.5. THE NATIONAL WASTE MANAGEMENT STRATEGY

The National Waste Management Strategy presents the South African government's strategy for integrated waste management for South Africa. It deals among others with: Integrated Waste Management Planning, Waste Information Systems, Waste Minimisation, Recycling, Waste Collection and Transportation, Waste Treatment, Waste Disposal and Implementing Instruments.

In the case of the proposed development, an integrated waste management system must be adopted, which includes waste minimisation, waste recycling and the proper storage and disposal of waste, which does not impact on the environment and human health.

5.6. THE NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998)

The National Water Act, 1998 (Act No. 36 of 1998) (NWA) gives effect to the constitutional right of access to water. The Act's overall purpose is to ensure that South Africa's water resources are protected, used and managed in ways which take into account a number of factors, including inter-generational equity, equitable access, redressing the results of past racial and gender discrimination, promoting sustainable and beneficial use, facilitating social and economic development, and providing for water quality and environmental protection.

The NWA makes persons who own, control, occupy or use land responsible for taking measures to prevent pollution of water resources, and empowers Government authorities to take measures to enforce this obligation.

All the requirements of the National Water Act, 1998 (Act 36 of 1998) regarding water use and pollution management must be adhered to at all times. The proposed development includes a Water Use Licence Application for the abstraction from a borehole for potable use and for the installation of package plants.

5.7. THE NATIONAL HERITAGE RESOURCES ACT, 1999 (ACT NO. 25 OF 1999)

The purpose of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) is to:

- Introduce an integrated and interactive system for the management of the national heritage resources;
- Promote good government at all levels,
- Empower civil society to nurture and conserve their heritage resources so that they may be bequeathed to future generations;
- To lay down general principles for governing heritage resources management throughout South Africa;

- To introduce an integrated system for the identification, assessment and management of the heritage resources of South Africa;
- To establish the South African Heritage Resources Agency together with its Council to co-ordinate and promote the management of heritage resources at national level;
- To set norms and maintain essential national standards for the management of heritage resources in South Africa and to protect heritage resources of national significance;
- To control the export of nationally significant heritage objects and the import into South Africa of cultural property illegally exported from foreign countries;
- To enable the provinces to establish heritage authorities which must adopt powers to protect and manage certain categories of heritage resources;
- To provide for the protection and management of conservation-worthy places and areas by local authorities; and
- To provide for matters connected therewith.

The Contractor shall at all times observe the NHRA and ensure the protection of any heritage resources, if and when discovered on site.

Burial sites may be present, the necessary protocols should be in place for dealing with the remains, particularly during the construction phase of the project.

5.8. THE OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT NO. 85 OF 1993)

The Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) provides for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work.

In terms of this Act, a Health and Safety Officer and Protocol must be implemented on any sites. The appointment of a Health and Safety Officer (HSO) is the responsibility of the Applicant and contractor and is included in this report to ensure due diligence on construction sites. It is the responsibility of the appointed HSO to conduct any required audits and as such only the appointment of an HSO will be auditable in terms of this document.

5.9. SANS 10400 APPLICATION OF THE NATIONAL BUILDING REGULATIONS

The application of the National Building Regulations contains performance parameters relating to fire safety, sanitation systems, moisture penetration, structural safety, serviceability and durability. It also takes into account how the above can be established to reflect social expectations in a manner which supports sustainable development objectives.

5.10. THE NATIONAL BUILDING REGULATIONS AND BUILDING STANDARDS ACT, 1977 (ACT NO. 103 OF 1977)

The National Building Regulations and Building Standards Act, 1977 (Act No. 103 of 1977) as amended must be complied with. This act addresses, inter alia:

- Specifications for draftsmen, plans, documents and diagrams;
- Approval by local authorities;
- Appeal procedures;
- Prohibition or conditions with regard to erection of buildings in certain conditions;
- Demolition of buildings;
- Access to building control officers;
- Regulations and directives; and
- Liability.

6. ENVIRONMENTAL IMPACTS AND MITIGATIONS

6.1. POTENTIAL IMPACTS

Environmental impacts are any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects. All potential impacts and risks as described below, and identified in the BA process, will be mitigated by measures identified in the broader EMPr.

6.1.1. Geographical, geological and physical aspects

Activities	Description	Aspects	Potential Environmental Impacts
Planning, Design and Development Phase			
Development of the proposed estate	The development will result in the removal of more than 1 hectare of indigenous vegetation.	Change of land use	**Loss of natural vegetation**
Operational Phase			
No impact on soil and groundwater is anticipated during the operational phase.			

6.1.2. Socio-economic aspects

Activities	Description	Aspects	Potential Environmental Impacts
Planning, Design and Development Phase			
Construction works and activities.	Job creation and business opportunities during the construction phase.	Employment and business opportunities.	**Positive socio-economic impact.**
Operational Phase			
Operation of the development.	Limited job creation during operation phase.	Employment and business opportunities.	**Positive socio-economic impact.**

6.1.3. Nuisance Factor

Activities	Description	Aspects	Potential Environmental Impacts
Planning, Design and Development Phase			

Activities	Description	Aspects	Potential Environmental Impacts
Use of construction vehicles and machinery.	Construction vehicles and other construction machinery will increase the noise levels during working hours. Increased noise levels may be a nuisance factor to neighbouring land occupiers.	Increased noise levels.	**Noise nuisance.**
Site clearing, earthworks, construction activities, use of construction vehicles and machinery, and building.	Dust generation because of earthworks and construction activities during the development phase.	Dust generation	**Dust nuisance.**
Operational Phase			
No noise impact anticipated during the operational phase.			

6.1.4. Traffic

Activities	Description	Aspects	Potential Environmental Impacts
Planning, Design and Development Phase			
Movement of construction vehicles.	Additional traffic resulting from the new estate development.	Increased construction vehicle activity.	**Traffic impact flow in the area.**
Operational Phase			
Movement of vehicles in and out of the development during operation.	The use of the development and facilities will increase traffic volumes that will result in longer delays at critical intersections and increased vehicle emissions.	Increased traffic volumes.	**Impact of traffic flow and volumes in the area.**

6.2. MITIGATION AND MANAGEMENT MEASURES

6.2.1. MANAGEMENT MEASURES

- An Environmental Control Officer (ECO) must be appointed to oversee the construction phase (including the implementation of the EMPr and any applicable conditions of the environmental authorisation).
- All mitigation measures detailed in this EMPr must be adhered.
- The construction of individual houses must adhere to the requirements of the House CEMP included under **Appendix H**. The individual homeowners must comply with the House CEMP, and the HOA must oversee compliance with the House CEMP.

6.2.2. MITIGATION MEASURES

The following impact mitigation measures are being recommended by the EAP.

1. Planning, design and development phase

a. Mitigation for potential soil and groundwater contamination

- Removal and clean-up of spill immediately after occurrence.
- All construction vehicles must be properly maintained to prevent leaks.
- Cement mixing must be confined to a designated area and must be done on an impervious surface, or pre-mixed cement must be used.
- Any fuel stored on site must be kept in bunded storage tanks.
- Drip trays are to be utilised during daily greasing and re-fuelling of machinery and to catch incidental spills and pollutants underneath all equipment that uses hydrocarbons.
- Drip trays are to be inspected on a weekly basis for leaks and effectiveness and emptied when necessary. This is to be closely monitored during rain events to prevent overflow.
- An oil spill kit needs to be available on site, and the use thereof must be implemented.

b. Mitigation for potential erosion and loss of topsoil

The Stormwater Management Plan included in the Services Report must be implemented.

c. Mitigation for noise nuisance

Noise mitigation measures provided under **Section 11.2.8** of this EMPr must be implemented.

d. Mitigation for dust nuisance

- Dust mitigation measures such as sprinklers and haybales provided in this EMPr must be implemented.
- The development footprint must be restricted as far as possible. Only areas required for the actual buildings to be cleared.
- Construction site cordoned off and no vegetation outside the development area may be cleared.

2. Operational phase

a. Mitigation for potential traffic impact

- No mitigation proposed.

7. ROLES AND RESPONSIBILITIES

This section deals with the responsibilities of various parties during the Construction Phase of any development.

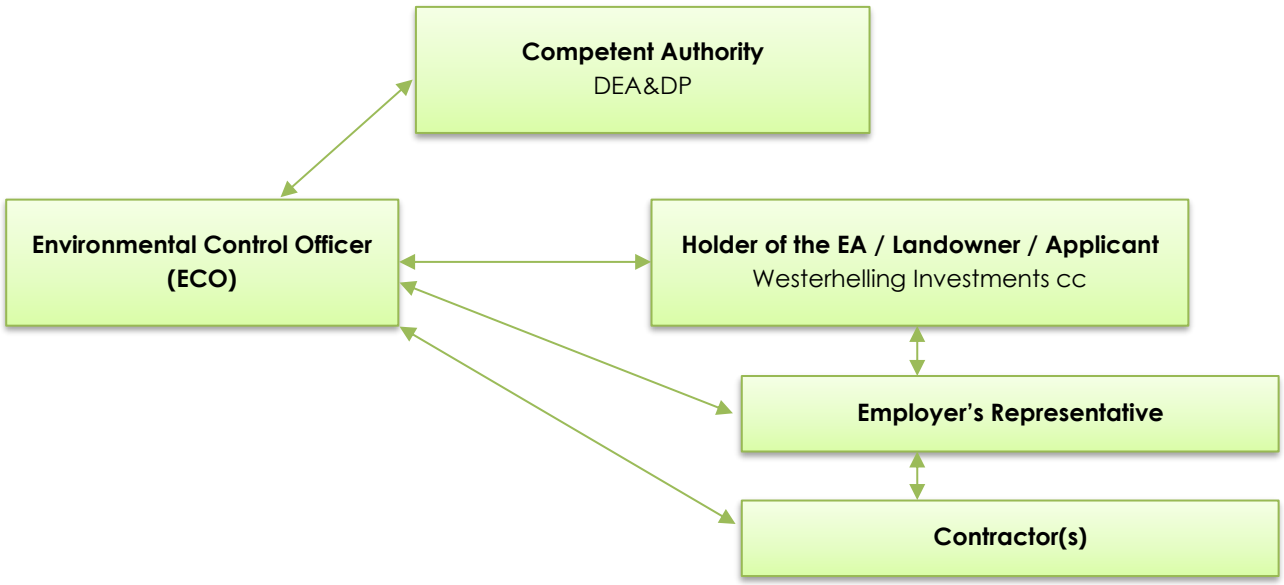


Figure 3: Flow diagram illustrating roles and responsibilities.

The implementation of this EMPr requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during the construction phase.

The following stakeholders will be involved with the EMPr either during the construction phase, operational phase or both.

7.1. THE COMPETENT AUTHORITY

In the Western Cape, DEA&DP is the competent authority responsible for issuing EAs in term of NEMA, NEM: WA, NEM:BA. This Directorate has overall responsibility for ensuring that the Applicant complies with the conditions of its EA as well as this EMPr once approved.

During the construction and operational phases of the EMPr the lead authority will have the following role to play:

- Conduct ad hoc compliance inspections.
- Review the ECO's performance reports and take action as deemed necessary.
- Whenever necessary, the authorities are to aid in understanding and meeting the specified requirements.
- Ensure and timeously recommend suitable corrective measures are undertaken by the Applicant/ER where the Applicant has reported non-compliance or when an audit report is received indicating any non-compliance.
- Enforcing compliance by the Applicant.

7.2. THE APPLICANT

Under South African environmental legislation, the Holder of the EA (e.g. the Applicant) is accountable for the potential impacts of the activities that are undertaken and is responsible for managing these impacts, both in the construction and operational phases. The Applicant therefore has overall and total environmental responsibility

to ensure that the EMPr is implemented and that both the EMPr and the EA are complied with at all times. The Applicant is also responsible for ensuring that all other environmental related legislation is complied with.

The Applicant is responsible for the development and implementation of the conditions of the EA in terms of the planning and design of the development and construction thereof.

The Applicant remains fully responsible for the implementation of this EMPr, and compliance with the EMPr and EA until such time as an application for amendment indicating a change in ownership or transfer of the EA to another party is submitted to DEA&DP. Only once this amendment application has been approved is this responsibility then shifted to the new holder of the EA.

Amongst the general responsibilities above the Applicant is also completely and solely responsible for:

- Ensuring that any changes to the project or aspects thereof, as approved during the EIA process by the issuance of an EA, are timeously communicated to DEA&DP as these may require amendments to the EA via an amendment application process.
- Appointing an ECO, and where required an environmental auditor
- It is the Applicant responsibility to notify DEA&DP within 24 hours of an occurrence of any non-compliance with the EA, EMPr or any other environmental and water related legislation.
- Take the necessary action in terms of non-compliances.
- Ensuring that all the Applicant's, staff, representatives, contractors, consultants and any other agent operating under the employ of the Applicant comply with the EA, EMPr and any other environmental and water related legislation.
- Ensuring that all the necessary authorisations and permits have been obtained.
- Considering the ECO's observations and recommendations, acting where required.

7.3. THE EMPLOYER'S REPRESENTATIVE

The Employer's Representative (ER) would act as the Applicant's on-site implementing agent and has the responsibility to ensure that the Applicant's responsibilities are executed in compliance with relevant legislation and the EA.

Any on-site decisions/inputs regarding environmental management are ultimately the responsibility of the ER.

The on-site ER will have the following responsibilities in terms of the implementation of the Construction phase of this EMPr and assisting the Applicant to ensure compliance with the EA, EMPr and any other environmental and water related legislation:

- Ensuring, in conjunction with the Applicant, that the authorisations and permits have been obtained and conditions have been met.
- Ensure where required by the EA that a notice of commencement is submitted to DEA&DP at least two weeks prior to commencement.
- Assist the Applicant with the appointing of an ECO and, where specifically required by the EA an Environmental Auditor.
- The ER will ensure that the appointed ECO is paid timeously thereby ensuring an ongoing ECO service.
- Should the Applicant or the ER change or cancel the ECO's services (either verbally, in writing or implied due to non-payment of fees) or should the ECO terminate their services the ER must notify DEA&DP of this in writing within 7 days.
- Take action in regard to any non-compliance that is reported on or noted.
- Ensuring that the Applicant is aware of any environmental non-compliance on site.
- Considering the ECO's observations and recommendations.
- Ensuring that ECO is made aware of any changes in terms of the project.
- Reviewing and approving the Contractor's method statements.
- Ensuring that all Contractor's and Sub-contractors are implementing the EMPr and meeting the necessary requirements of the EA.
- Ensuring that all works are occurring within the permitted areas.

- Assisting the Contractor in finding environmentally responsible solutions to problems.
- Ordering the removal of person(s) and/or equipment not complying with the EMPr specifications.
- Ensure that the ECO is provided with any documentation required from the project team or contractors.
- Issuing fines for transgressions of site rules and penalties for contravention of the EMPr, with input from the ECO and providing proof in this regard.

7.4. THE CONTRACTOR

The contractor is bound by the requirements of this EMPr. The Contractor will be subject to the issuance of penalties by the ER as stipulated herein. Any damage to the environment temporary or otherwise because of non-compliance with this EMPr will be made good at the contractor's cost. In addition, the Contractor will have the following responsibilities:

- The Contractor will ensure that all senior and management staff involved with the project are aware and familiar with the requirements of this EMPr.
- The ECO will assist with the environmental induction training of site staff. It is the contractor's responsibility however to ensure that all staff and sub-contractors attended and undergo the necessary environmental site inductions. The Contractor will maintain a register of all staff and sub-contractors that have undergone an environmental site induction.
- The contractor will adhere to and comply with all the requirements and specifications of this EMPr. Any non-compliance will be reported to the ECO and ER immediately.
- The contractor is fully responsible for all sub-contractors and service providers and their compliance with this EMPr on site. The Contractor will ensure that all sub-contractors and services providers are made aware of the requirements of the EMPr and that they have a responsibility to comply with the EMPr.
- The Contractor is responsible for ensuring that all sub-contractors and service providers comply with this EMPr.
- The Contractor will read the ECO performance reports and take action as required.

7.5. THE ENVIRONMENTAL CONTROL OFFICER

The Environmental Control Officer (ECO) will be an independent environmental consultant appointed by the Applicant. The role of the ECO is to assist with the monitoring and where possible to provide guidance in terms of environmental matters.

The ECO will regularly monitor and review the on-site environmental management and implementation of the construction phase of this EMPr.

The ECO is not responsible for ensuring or enforcing compliance with the EA, EMPr or any other environmental and water related legislation. This is the responsibility of the Applicant and authorities. The role of the ECO is that of a monitoring and supportive function and advising the Applicant of non-compliance with respect to the conditions of the EA.

The ECO's duties consist of the following:

- Where required, provide assistance in terms of the Notice of commencement to DEA&DP.
- Conducting regular site inspections at the frequency as stipulated in **Section 8.1** of this EMPr.
- Monitoring and verifying as far as possible adherence to the EMPr and the EA.
- Monitoring and verifying that environmental mitigation measures are in place where necessary to facilitate keeping environmental impacts to a minimum.
- Reporting to the Applicant and the ER any relevant observations made during site inspections.
- The ECO will report all noted/observed non-compliances with the EMPr and EA to the Applicant's representative.
- As far as possible advice the ER in regard to environmental matters that may become an issue.
- Reviewing the Contractor's construction method statements together with the ER.

- The ECO will make recommendations to the ER, with regards to the issuing of penalties in accordance with the EMPr.
- Facilitating the maintaining of open and direct lines of communication between the ER, Employer, Contractor and where necessary, the public, with regard to environmental matters.
- Assisting with the appointing of the relevant specialists (botanists, wetland specialists, etc.), as required, to advise the Engineer, Applicant or ER.
- Assist the contractor with basic awareness training of all construction staff, as to the requirements for working on the site.
- Assisting the Contractor in finding environmentally responsible solutions to problems.
- Monitoring the undertaking by the Contractor of environmental awareness training for all personnel and subcontractors coming onto site and assisting with this where necessary.
- Advising on the removal of person(s) and/or equipment not complying with the specifications (via the ER).
- Recommending the issuing of fines for transgressions of site rules and penalties for contraventions of the EMPr to the ER for action.
- Reporting to the Applicant on the implementation of the EMPr and compliance with the EA on a regular basis.
- Where necessary, recommending additions and/or changes to the EMPr to the directorate.
- The ECO will draft an environmental performance report on a monthly basis (except during shutdown periods). This report will be submitted to the Contractor, ER and to DEA&DP. The ECO may submit this via email.

7.6. THE ENVIRONMENTAL AUDITOR

Where required by the EA an environmental auditor will be appointed by the Applicant. The auditor will be an independent environmental consultant. The auditor will carry out a compliance audit based on the EA and EMPr of all of the activities being undertaken.

The auditor will conduct, and report audit findings based on the audit requirements stipulated in the EA. Any audit costs are for the Applicant account and are in addition to regular ECO services.

8. MONITORING

Monitoring is an important tool in determining the effectiveness of management actions by measuring changes in the environment. These could be in the form of fixed-point photography where an area is photographed on a regular / seasonal basis to ascertain changes, monitoring of a particular aspect such as water quality parameters, recordings of animal movement from fixed point etc. The most important aspect of any monitoring programme is consistency and continuity. This will ensure a level of scientific accuracy to determine baselines / thresholds and measure changes / deviations, which then drive management reactions.

Photographs must be taken during construction phase at each ECO site visit.

8.1. EMPr COMPLIANCE MONITORING AND FREQUENCY

The **Applicant and Contractor(s)** are responsible for monitoring all construction activities on a **day-to-day** basis to ensure compliance with the EMPr, EA and other applicable permits/authorisations, throughout the construction phase of the development.

The **appointed ECO** will undertake EMPr compliance monitoring to ensure that the EMPr is implemented throughout the development phase of the proposed development. The findings and outcomes of these inspections will be recorded in the **Compliance Monitoring Report** that will be submitted to the competent authority at intervals as indicated in the EA.

The appointed ECO will undertake **two site visits a month** (excluding during shut down periods), until such time that the construction of the services infrastructure is completed. After construction of services is complete the ECO should visit the site at least once a month until all top structures are complete. The ECO is **not** responsible for issuing instructions, ensuring, or enforcing compliance. The ECO is not responsible for addressing design requirements. The ECO fulfils a role of monitoring and guidance as well as communication with role players. Should less than one visit per month be required, this must first be agreed to by the competent authority.

8.2. ENVIRONMENTAL AUDITS

The holder of the EA (e.g. the Applicant) must, for the period during which the EA and EMPr, remain valid ensure that compliance with the conditions of the EA and the EMPr is audited at least once every 5 years or at intervals as indicated in the EA; and submit an **Environmental Audit Report** to the relevant competent authority.

Submission of the **final Environmental Audit Report** to the competent authority will indicate the end of the development phase.

8.2.1. Audit Reports Frequency and Format

The following table provides a summary of the timeframes for the various Audit Reports specified in the EA.

Table 2: Summary of Audit Report timeframes.

ENVIRONMENTAL AUDIT TIMEFRAMES		
Type	**Frequency**	**Criteria**
Construction Audit	Annually until such time that the development/installation of services infrastructure is completed.	Audit compliance with conditions of the EA.
Final Construction Audit	2 months after completion of services infrastructure or as indicated in the EA conditions.	Audit compliance with conditions of the EA.
Operational Audit	Not applicable.	Not applicable.

In terms of the NEMA EIA Regulations, 2014 (as amended) Audit Reports must be submitted to the registered Interested & Affected Parties **within 7 days** of submission to the competent authority.

The **Environmental Audit Report** must contain all information set out in Appendix 7 of the NEMA EIA Regulations, 2014 (as amended). Any other requirements of the EA or any other authorisations must be incorporated into an Audit where necessary.

8.3. COMPLAINTS REGISTER

The Contractor shall keep a current and up-to-date complaints register. The complaints register is to be a record of all complaints received from communities, stakeholders and individuals. The Complaints Record shall:

- Record the name and contact details of the complainant;
- Record the time and date of the complaint;
- Contain a detailed description of the complaint;
- Where relevant and appropriate, contain photographic evidence of the complaint or damage; and
- Contain a copy of the Contractor's written response to each complaint received and keep a record of any further correspondence with the complainant. The Contractor's written response will include a description of any corrective action to be taken and must be signed by the Contractor and affected party. Where a damage claim is issued by the complainant, the Contractor shall respond as described below.

The Contractor shall:

1. Ensure that all queries, complaints and claims are dealt within an agreed timeframe;
2. Ensure that any or all agreements are documented, signed by all parties and a record of the agreement kept in the EMPr file;
3. Ensure that a complaints telephone numbers are made available to all landowners and affected parties; and
4. Ensure that contact with affected parties is courteous at all times.

9. EMPr REPORTING

9.1. DOCUMENTATION

The documentation listed below must be kept on site in the form of an **Environmental File**, in order to record compliance with the EMPr. The Environmental File must include, but is not limited to:

- Copy of the EMPr;
- Copy of the EA;
- Copy of all other licences/permits;
- Copy of all rehabilitation plans (if necessary);
- Copy of the Stormwater Management Plan (if necessary);
- Environmental Method statements compiled by the Contractor;
- Environmental register, which shall include:
    - Complaints register.
    - Monitoring results (if necessary).
    - Incident register – including copies of notification of Emergencies and Incidents, this must be accompanied by a photographic record.
- Waste Documentation such as Waste- and Sewerage Disposal Certificates;
- Material Safety Data Sheets for all hazardous substances;
- Dust suppression register (if necessary);
- Water Quality Monitoring reports (if necessary); and
- Written Corrective Action Instructions.
- ECO monthly reports

10. MANAGEMENT AND MONITORING PROCEDURES

This section addresses all issues relating to the physical construction, preparation for construction, monitoring during construction, decommissioning of non-permanent items on the site as well as the landscaping and rehabilitation directly after construction is completed. This section will have most relevance to the appointed contractors.

10.1. ENVIRONMENTAL INDUCTION AND AWARENESS TRAINING

The ECO in consultation with the contractor shall ensure that adequate environmental awareness training of senior site personnel takes place and that all construction workers receive an induction on the importance and implications of the EMPr. The presentation shall be conducted, as far as is possible, in the employees' language of choice.

As a minimum, training should include:

- Explanation of the importance of complying with the EMPr.
- Discussion of the potential environmental impacts of construction activities.
- The benefits of improved personnel performance.
- Employees' roles and responsibilities, including emergency preparedness.
- Explanation of the mitigation measures that must be implemented when carrying out their activities.
- Explanation of the specifics of this EMPr and its specification (no-go areas, etc.)
- Explanation of the management structure of individuals responsible for matters pertaining to the EMPr.

Where staff turnover is high and with additional appointment of Sub-contractors, it may be necessary to undertake additional induction training sessions. The Contractor must keep records of all environmental training sessions, including names, dates and the information presented.

Notwithstanding the specific provisions of this particular section, it is incumbent upon the Contractor to convey the sentiments of the EMPr to all personnel involved with the works.

Appendix D contains some useful **Environmental Awareness Material**.

10.2. PUBLIC LIAISON AND COMMUNICATION

Open, transparent and good relations with affected landowners, communities and regional staff are an essential aspect to the successful management and mitigation of environmental impacts.

The Applicant must ensure that the adjacent landowners are informed and updated throughout the construction phases. Sufficient signage should be erected around the site (including at the entrance), informing the public of the construction activities taking place. The signboards should include the following information:

- The name of the Contractor.
- The name and contact details of the site representative to be contacted in the event of emergencies or complaint registration.

10.3. WORK HOURS

Construction activities during weekdays should be confined to the following hours – 07h30 and 17h30. This is to reduce the impact on the permanent residents of Infanta or and people who visit the area during the week. Construction activities should not be permitted over weekends, specifically long weekends (such as the Easter Weekend) and the December school holidays, specifically the period 14 December to 6 January. This is to reduce the impact on those people who live in Infanta permanently and or who visit the area over weekends and holiday times.

Temporary Site Closure

In the event of a temporary site closure occurring such as the builder's holidays, temporary suspension of works or any period of inactivity longer than 7 working days the Contractor is to notify the ECO. The Contractor shall check the site according to the requirements of the ECO and ensure that all items are addressed. The Contractor will provide a brief written report (refer to the **Temporary Shutdown Checklist** included under **Appendix E**) on compliance to the ER and ECO prior to the temporary shutdown date.

10.4. HEALTH AND SAFETY

The Contractor shall always observe the Occupational Health and Safety Act No. 85 of 1993 (OHSA) and ensure adequate safety precautions on the site.

Telephone numbers of emergency services, including the local firefighting service, shall be displayed conspicuously in the Contractor's office near a telephone. No weapons (firearms, airguns, daggers etc.) are permitted on site. The Contractor shall ensure that contact details of the local medical services are available to the relevant construction personnel prior to commencing work.

10.5. METHOD STATEMENTS

Method statements are written submissions by the Contractor to the ER (with input from the ECO) in response to the requirements of this EMPr or to a request by the ER or ECO. A minimum requirement will consist of the listed MS's below. Further MS's may be requested by the ER or ECO.

The Contractor shall be required to prepare method statements for several specific construction activities and/or environmental management aspects as specified. **Appendix C** provides an example for a **Method Statement Template**. It is the Contractors responsibility to ensure that the required method statements are drafted and submitted.

The Contractor shall not commence the activity for which a method statement is required until the ER has approved the relevant method statement.

Method statements must be submitted at least **seven (7) business days** prior to the date on which approval is required (start of the activity). Should the method statement be rejected this will be done so with comment. The seven-day submission period will commence once again on re-submission of the MS. Should the MS be submitted and no response (acceptance or rejection) be obtained within 7 days from the ER or ECO the MS will be considered as having been accepted and work can commence in line with the submitted MS.

Failure to submit a method statement may result in suspension of the activity concerned until such time as a method statement has been submitted and approved.

An approved method statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the contract. However, any damage caused to the environment through activities undertaken without an approved method statement shall be rehabilitated at the contractor's cost and to the satisfaction the ECO and ER.

The method statements shall cover relevant details about:

- Construction procedures and location of the construction site.
- Start date and duration of the procedure.
- Materials, equipment and labour to be used.
- How materials, equipment and labour would be moved to and from the site as well as on site during construction.
- Storage, removal and subsequent handling of all materials, excess materials and waste materials of the procedure.

- Emergency procedures in case of any reasonably potential accident / incident which could occur during the procedure.
- Mitigation measure that will be employed.
- Compliance / non-compliance with the EMPr Specification and motivation if non-compliant.

10.5.1. Method statements required

Based on the specifications in this EMPr, the following method statements are required as a minimum, and more method statements may be requested as required.

MS1: ***Site layout and establishment***

A layout plan and the method of establishment of the construction camp, i.e. all offices, accommodation facilities, large volume cement batching areas, storage & stockpiling areas, workshops and all other areas/facilities required for the undertaking of activities required for completion of the project. The plan shall include the location and layout of waste storage, ablution facilities, stockpiling and spoil areas and hazardous material storage areas. The decommissioning and removal of these facilities on completion of construction works shall also be detailed.

MS2: ***Site clearing***

The Contractor shall submit a site clearing method statement for all areas where the Contractor is required to, or intends to, clear vegetation within the development footprint. The method statement shall clearly indicate what is to be cleared and how this will be done, where and how cleared material would be stored or disposed of, etc. This method statement will also detail the setting aside of topsoil for rehabilitation/landscaping.

MS3: ***Cement and concrete batching***

The Contractor shall submit a method statement detailing cement storage, concrete batching areas and methods, method of transport of cement and concrete, storage and disposal of used cement bags, etc.

MS4: ***Traffic control and accommodation***

The Contractor shall submit a method statement for approval, detailing how traffic is to be accommodated within the development during construction. Cognisance must be taken of any no-go areas.

MS5: ***Solid waste control system***

The Contractor shall submit a method statement detailing a solid waste control system (storage, provision of bins, site clean-up schedule, bin clean-out schedule, rubble disposal/reuse, rubble removal frequency etc.) to the ER for approval.

MS6: ***Wastewater control system***

The Contractor shall submit a method statement to the ER detailing how wastewater would be collected from all wastewater generating areas, as well as storage and disposal methods. If the Contractor intends to carry out any on-site wastewater treatment, this should also be included.

MS7: ***Dust control***

The Contractor shall submit a method statement to the ER detailing how potential dust and windblown sand will be monitored and addressed on site. The contractor will consider the recommendations above while bearing in mind that these are not the only available solutions.

MS8: ***Soil erosion prevention and sedimentation control***

The Contractor shall submit a method statement to the ER detailing how soil erosion and sedimentation control will be implemented, methods to be used and rehabilitation of disturbed areas.

MS9: ***Hazardous substances & Emergency Procedures***

The Contractor shall provide a method statement detailing the hazardous substances / material that are to be used during construction, as well as the storage, handling, and disposal procedures for each substance

as well as materials such as rubble soil and water contaminated with hazardous substances. The details of the disposal service providers (if required), supplier and suitable DEAT approved disposal sites that will be used by the contractor are to be included. In addition, this MS will include an emergency procedure plan that will detail responses relating to the leaking or spillage of fuels oils or other hazardous substances. This method statement shall in no way override, replace, and void or offer any exemption from neither any relevant legislation nor the requirements of the Occupational Health and Safety Act.

MS10: ***Landscaping / Rehabilitation***

Should vegetation rehabilitation be required because of disturbance, this must be addressed in this Method Statement. Rehabilitation details relating to plant species (all indigenous and suitable to the vegetation type), plant numbers, irrigation and establishment, planting methods etc. must also be detailed.

11. IMPACT MANAGEMENT OUTCOMES AND ACTIONS

This section provides a description of activities associated with the proposed development and associated infrastructure. There are numerous activities identified for the proposed development and for each activity a set of prescribed impact management outcomes and associated management actions have been identified. Holders of EAs are responsible for ensuring the implementation of these controls for all projects as a minimum requirement for mitigating the impact of construction related activities.

The tables in this section provide a description of the management outcomes associated with the proposed development, and for each activity a set of prescribed impact management outcomes and associated management actions have been identified.

Tables key/legend:

The table below provides an understanding of the structure of the impact management outcomes and actions tables provided in this section.

Management Outcome:	***What** impact needs to be avoided?*
Management Actions:	
***Mitigation and management measures** required to reduce the potential impacts.*	
Project Specific Management Actions:	
Specific mitigation and management measures recommended in the specialists' reports or contained in the EA.	
Implementation:	
Responsible party:	***Who** needs to implement the management actions?*
Method of implementation:	***How** should the actions be implemented?*
Timeframe for implementation:	***When** do the actions need to be implemented?*
Monitoring:	
Responsible person:	***Who** should monitor compliance?*
Frequency:	***How often** should monitoring occur?*
Evidence of compliance:	***Proof** of compliance (e.g. reporting, photographs, etc.)*

11.1. PRE-CONSTRUCTION MANAGEMENT PLAN

It is recommended that sustainable design considerations are implemented during the planning phase in order to ensure that the impacts associated with the development are avoided, minimised or managed before construction commences.

11.1.1. Appointment of an ECO

The ER / Applicant must appoint a suitable, experienced and independent ECO to monitor the implementation and compliance with the EMPr.

The ECO should be appointed a minimum of 3 weeks prior to commencement of site activities to ensure that the necessary notification can be made as required by the EA.

The appointed ECO will undertake **two site visits a month** (excluding during shut down periods), until such time that the construction of the services infrastructure is completed. After construction of services is complete the ECO should visit the site at least once a month until all top structures are complete (excluding during shut down periods). Should less than one visit per month be required, this must first be agreed to by DEA&DP.

The ECO will produce an environmental monitoring report once per month (excluding shut down periods). This report will be submitted to the contractor and the ER. The report will highlight environmental aspects relating to the construction phase of the project during the reporting period.

11.1.2. Updating Documents

The Applicant and contractor shall ensure that the EMPr, Site Plans and all the relevant documents required are up to date and approved by DEA&DP prior to commencement of the construction phase.

The appointed contractor will be required to submit a Traffic Accommodation Plan for approval by the Department of Roads and Public works for approval prior to commencement.

11.1.3. Site demarcation

Management Outcome:	Site demarcation and site establishment: the development footprint must be kept to demarcated site area to avoid any impacts to the surrounding environment.
Management Actions:	
• The "site" refers to all areas required for construction purposes and not necessarily the property boundaries. The site will be limited as far as possible to reduce the development footprint. Suitable specialist input may be sought, if necessary, to determine positions of wetlands, buffer areas etc. • The boundaries of the site shall be demarcated prior to any work commencing on the site. The site demarcations shall be removed when the site is decommissioned. • All construction activities, materials, equipment and personnel will be restricted to within the site. The boundaries of the site must be demarcated in order to restrict construction activities within the site. The use of danger tape for demarcation purposes is discouraged and must be limited as far as possible. Brightly coloured droppers and coloured nylon cord/netting/fencing/wire with markers must be considered as an alternative to danger tape. • The demarcations must be maintained and ensure that materials used for construction on the site do not blow on or move outside the site and environs. • Construction workers, vehicles and works are forbidden to access any private property unless approval has been granted by the ER in writing after the landowner has given permission.	
Project Specific Management Actions:	
None.	
Implementation:	
Responsible party:	ER and the Contractor(s)
Method of implementation:	• The boundary of the site will be agreed with and approved by the ER. • The Contractor shall ensure that the approved construction area will be adequate to cover the project without further space adjustments being required at a later date. Changes must be approved by the ER. • The method of demarcating the boundaries shall be determined by the Contractor and agreed to by the ER prior to any work being undertaken. • The Contractor shall ensure that all works, labour and materials remain within the boundaries of the site, unless otherwise agreed in writing with ER. It will be the responsibility of the Contractor to decide on an appropriate system of protective fencing for the site, if required.
Timeframe for implementation:	Prior to commencement of the construction phase.
Monitoring:	
Responsible person:	ECO

Frequency:	Prior to commencement of the construction phase and whenever there are significant changes to the site layout plan.
Evidence of compliance:	ECO to obtain records from the Contractor and report in environmental audit reports.

11.1.4. No-go areas

Management Outcome:	Demarcation of No-Go areas: no development is allowed beyond the site area.
Management Actions:	
• Construction camps and associated facilities shall be established in a manner that does not adversely affect the environment. • The construction area shall be kept to a minimum necessary for construction activities. • The site layout plan will indicate the placement and location of, *inter alia*, following: o Site offices; o Stores, silos and stockpile areas; o Large plant and vehicle parking area; o Toilet facilities; o Haul routes; o Site access; o Temporary waste storage area; and o Large volume fuel storage (tanks or mobile fuel trailers). • The site layout shall take cognisance of access for deliveries and services. These activities should not result in environmental disturbance and avoid such disturbance. • Suitable areas for maintenance and refuelling, large volume cement/concrete batching etc. must be identified by the ER in consultation with the ECO. • The site layout plan shall also indicate security requirements (including temporary and permanent fencing, and lighting etc.). The construction site should be secured against unauthorised entry. • Only security personnel may be accommodated at the construction site during the development phase.	
Project Specific Management Actions:	
The western corner of the site has been demarcated as a Limestone Fynbos Conservation area and will be demarcated as a no-go area. A sufficient wide (40m) corridor around the watercourse is provided for in the development layout this 40m corridor is also considered a no-go area.	
Implementation:	
Responsible party:	ER and the Contractor(s)
Method of implementation:	• Prior to the contractor taking handover of the site, the contractor will submit to the ER a site layout plan. This plan must be approved and signed off by the ER with input from the ECO. • The ER will ensure that the ECO is involved in establishment of the site layout prior to commencement of the proposed action. • Before construction can begin, the Contractor shall submit to the ER for approval a site establishment **method statement**. • A copy of the approved site layout plan will be provided to the ECO prior to commencement of construction. Changes to the site layout must be approved by the ER.
Timeframe for implementation:	Prior to commencement of the construction phase.
Monitoring:	
Responsible person:	ECO
Frequency:	Prior to commencement of the construction phase and whenever there are significant changes to the site layout plan.
Evidence of compliance:	ECO to obtain records from the Contractor and report in environmental audit reports.

11.1.5. Access roads

Management Outcome:	Access roads: Minimise impact to the environment through by only using planned access to the site.
Management Actions:	
• Identification of No-Go areas is to be informed by the environmental assessment, site walk through, and any additional areas identified during development; • Unless the boundary of the No-Go areas can be clearly identified, the relevant specialist (botanist, aquatic ecologist etc.) must be appointed by the ER to identify the relevant boundaries physically on site. The positions of the No-Go area boundary, identified by the specialist, will be recorded either with a GPS unit or by a surveyor. Once the boundary has been identified by the specialist and recorded the contractor must demarcate the boundary accordingly. • Erect, demarcate and maintain a temporary fence around the perimeter of any No-Go area; • Fencing of No-Go areas is to be undertaken in accordance with **Section 11.1.6: Fencing**; and • Unauthorised access and development related activity inside No-Go areas is prohibited.	
Project Specific Management Actions:	
None.	
Implementation:	
Responsible party:	ER and Contractor
Method of implementation:	• No-Go area demarcation must be approved by the ER. • The ER may declare additional No-Go areas at any time during the construction phase as deemed necessary and/or at the request of the ECO and/or specialist.
Timeframe for implementation:	Prior to commencement of the construction phase.
Monitoring:	
Responsible person:	ECO
Frequency:	Prior to commencement of the construction phase and whenever there are significant changes to the site layout plan.
Evidence of compliance:	ECO to obtain records from the Contractor and report in environmental audit reports.

11.1.6. Fencing

Management Outcome:	Fencing: Ensure safe and controlled access to the site through the erection of fencing and gates where required.
Management Actions:	
• Traffic along public roads must be accommodated at all times. • Construction activities and deliveries may not interfere with the public road system. • All the required signage and hazard warnings are to be put in place. • All drivers must be in possession of an appropriate and valid driver's licence. • All relevant construction vehicles must be roadworthy and in an acceptable working condition. • All relevant permits for abnormal loads must be applied for and obtained from the relevant authority as required. • Access points to and from site as well as roadways in front of the site are to be kept clean and free from stone, sand, and grit. These areas must be swept regularly. • All construction vehicles, when on site and on the surrounding property, will not exceed the speed of 25km per hour, to ensure safety of vehicles, personnel, and the environment, and to lessen environmental degradation. Drivers who exceed the speed limit must be fined or dismissed by the Contractor or ER.	

- Access to the site must be gained at the designated areas as determined by the ER. As far as is possible use should be made of existing haul routes, tracks and roads. The creation of short-cut paths/routes or temporary vehicular tracks is to be strictly prevented.

Project Specific Management Actions:

Typical Fence Specification for perimeter fencing:

Post:

Post shall be 1500 mm galvanized steel post, with locking recess mechanism to secure panel edges and post shall be sealed with UV stabilized polymer cap and fitted with a 12mm base pin as manufactured by Cochrane international or similar approved. Colour of post to be black.

Foundations:

Depends on founding sub strata but typically 600mm deep x 400mm square at 15Mpa.

Wire Panels:

Panels shall be galvanized steel Clearvu pressed high density mesh panel off 3297 mm width and 1500mm high and have an aperture size of 76.2mm x 12.7 mm as manufactured by Cochrane international or similar approved. The panel may be reinforced by a 4mm x 50mm deep horizontal recessed V-band bend to allow for rigidity as per manufacturers discretion. Panels shall have a 2 x70 degree flange along sides for locking recess mechanisms to secure panel edges. Panels shall have a 2 x 30-degree flanges along top and toe. Panel post shall have a flush panel post finish with no climbing aid. Colour of fencing to be black.

One opening of 250mm wide x 250mm high for small animals shall be made in the middle of every fence panel.

No topping options to the fence for example razor wire, spikes or electric fencing will be allowed.

Typical Fence Specification for internal fencing:

Post:

Post shall be 750 mm galvanized steel post, with locking recess mechanism to secure panel edges and post shall be sealed with UV stabilized polymer cap and fitted with a 12mm base pin as manufactured by
Cochrane international or similar approved. Colour of post to be black.

Foundations:

Depends on founding sub strata but typically 600mm deep x 400mm square at 15Mpa.

Wire Panels:

Panels shall be galvanized steel Clearvu pressed high density mesh panel off 3297 mm width and 750mm high and have an aperture size of 76.2mm x 12.7 mm as manufactured by Cochrane international or similar approved. The panel may be reinforced by a 4mm x 50mm deep horizontal recessed V-band bend to allow for rigidity as per manufacturers discretion. Panels shall have a 2 x70 degree flange along sides for locking recess mechanisms to secure panel edges. Panels shall have a 2 x 30-degree flanges along top and toe. Panel post shall have a flush panel post finish with no climbing aid. Colour of fencing to be black.

No topping options to the fence for example razor wire, spikes or electric fencing will be allowed.

Implementation:	
Responsible party:	The Contractor and ER
Method of implementation:	• The Contractor must ensure that all the management actions are implemented. • The Contractor must ensure that the approved Traffic Accommodation Plan is implemented. • Should there be a need to undertake work that will impact on traffic the Contractor must ensure that all the required permissions have been obtained from the traffic authorities in writing. • The Contractor is responsible for ensuring that all vehicles are road worthy.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	

Responsible person:	ECO
Frequency:	Throughout the construction phase.
Evidence of compliance:	ECO to obtain records from the Contractor and report in environmental audit reports.

11.1.7. Site facilities

Management Outcome:	Site facilities: Provide clean toilet facilities, eating areas and potable water to all staff to minimise the risk of disease and impact to the environment and health impacts.
Management Actions:	
• Adequate fencing needs to be provided around the site. Fencing needs to be checked and maintained during the construction phase. • If necessary, suitable specialist input may be sought to determine positions of wetlands, buffer areas etc. The use of danger tape for demarcation purposes is discouraged and must be limited as far as possible. Brightly coloured droppers and coloured nylon cord/fencing wire with markers must be considered as an alternative to danger tape. • It will be the responsibility of the Contractor to decide on an appropriate system of protective fencing for the site, if required.	
Project Specific Management Actions:	
None.	
Implementation:	
Responsible party:	The Contractor and ER
Method of implementation:	The Contractor must ensure that all the management actions are implemented.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	ECO
Frequency:	Prior to commencement of the construction phase and whenever there are significant changes to the site layout plan.
Evidence of compliance:	ECO to obtain records from the Contractor and report in environmental audit reports.

11.2. CONSTRUCTION MANAGEMENT PLAN

These Construction Phase requirements are aimed at using Best Practise Principles and / or specialist recommendations to manage the impacts on the environment during the construction of the development.

11.2.1. Workshop, equipment maintenance and storage

Management Outcome:	Workshop, equipment maintenance and storage areas: Soil, surface water and groundwater contamination are minimized.
Management Actions:	
• All vehicles and equipment shall be kept in good working order to maximise efficiency and minimise pollution. Any leaks or similar mechanical problems are to be reported and repaired immediately. • No repairs and refuelling of construction vehicles are allowed to take place within close proximity of any wetlands or water courses.	

• All emergency maintenance and refuelling of plant on site shall take place at designated locations approved by the ER. Drip trays will be used for all refuelling and similar activities. This is to prevent any spillage contaminating the environment. • The Contractor shall ensure that no contamination of soil, vegetation or stormwater occurs around workshops and plant maintenance facilities. Where practical, all maintenance of plant and equipment on site shall be performed in the workshop or preferably off site. If it is necessary to do maintenance outside of the workshop area, the contractor shall obtain the approval of the ER prior to commencing these activities. • As far as possible servicing of plant etc. will be undertaken off site. Should emergency maintenance be required all precautions will be taken to prevent environmental impact. • Drip trays shall be used to collect used oil, lubricants, etc. during maintenance. Drip trays shall be provided for all stationary plant, generators, pumps and compressors. Drip trays shall be inspected and emptied daily and closely monitored during rain events to ensure that they do not overflow. All waste material in bunds and drip trays are to be managed as hazardous waste. All static plant (stationary > 6 months) shall be located within a bunded area with an impermeable surface. • Washing of vehicles and plant shall be restricted to urgent maintenance requirements only. Adequate wastewater collection facilities shall be provided. The use of detergents for washing shall be restricted to low phosphate and nitrate concentration as well as being a low sudsing type detergent.
Project Specific Management Actions:
• Machinery prone to oil or fuel leakage must be located at least 50 m away from any sensitive ecosystem, and the area bunded in order to contain leakages.

Implementation:	
Responsible party:	The Contractor
Method of implementation:	• The contractor will ensure that all of the above management actions are complied with and implemented. • The contractor will ensure that drip trays are being used at all times, and that there are enough drip trays available on site.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	The Contractor and ECO
Frequency:	Throughout the construction phase.
Evidence of compliance:	• The contractor to ensure compliance. • The ECO to provide details in environmental audit reports.

11.2.2. Storage, handling, use and disposal of hazardous substances.

Management Outcome:	Storage, handling, use and disposal of hazardous substances: Safe storage, handling, use and disposal of hazardous substances.
Management Actions:	
• The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible; • All hazardous substances must be stored in suitable containers as defined in the Method Statement; • Containers must be clearly marked to indicate contents, quantities and safety requirements; • All hazardous substances, such as fuel and lubricants, must be stored on-site on an impervious layer and within a secured and demarcated bunded area. The bunded area will be of sufficient capacity to contain a spill / leak from the stored containers; • An alphabetical Hazardous Chemical Substance (HCS) control sheet will be drawn up and kept up to date on a continuous basis; • All hazardous chemicals that will be used on site will have Material Safety Data Sheets (MSDS); • All employees working with HCS will be trained in the safe use of the substance and according to the safety data sheet;	

• Employees handling hazardous substances / materials must be aware of the potential impacts and follow appropriate safety measures. Appropriate personal protective • equipment must be made available; • The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers; • The tanks/ bowsers must be situated on a smooth impermeable surface (concrete) with a permanent bund. • The impermeable lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity of all the storage tanks/ bowsers (110% statutory • requirement plus an allowance for rainfall); • The floor of the bund must be sloped, draining to an oil separator; • Provision must be made for refuelling at the storage area by protecting the soil with an impermeable groundcover. • Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained; • All empty externally dirty drums must be stored on a drip tray or within a bunded area; • No unauthorised access into the hazardous substances' storage areas shall be permitted; • No smoking must be allowed within the vicinity of the hazardous storage areas; • Adequate fire-fighting equipment must be made available at all hazardous storage areas; • Where refuelling away from the dedicated refuelling station is required, a mobile refuelling unit must be used. Appropriate ground protection such as drip trays must be used; • An appropriately sized spill kit kept onsite relevant to the scale of the activity/s involving the use of hazardous substance must be available at all times; • The responsible operator must have the required training to make use of the spill kit in emergency situations; • In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of according to the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008). • Refer to **Section 11.2.10** for procedures concerning wastewater management and **Section 11.2.6** for solid waste management.
Project Specific Management Actions:
• Water pumps and cement mixers shall have drip trays to contain oil and fuel leaks – these must be cleaned regularly.

Implementation:	
Responsible party:	The Contractor
Method of implementation:	The contractor will ensure that all of the above management actions are complied with and implemented.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	The Contractor and ECO
Frequency:	Throughout the construction phase.
Evidence of compliance:	• The contractor to ensure compliance. • The ECO to provide details in environmental audit reports.

11.2.3. Cement / Concrete Batching

Management Outcome:	Cement / Concrete Batching: To control concrete and cement batching activities to minimise spillages and contamination of soil, surface water and groundwater.
Management Actions:	
• Concrete mixing must be carried out on an impermeable surface (such as on boards and/or within a bunded area with an impermeable surface) or make a hard surface and remove when done; • Concrete mixing areas must be fitted with a containment facility for the collection of cement laden water. This facility must be impervious to prevent soil and groundwater contamination;	

• Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains; • A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted; • Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility; • Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site; • Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to **Section 11.2.9: Dust Control**) • Any excess sand, stone and cement must be removed or reused from site on completion of construction period and disposed at a registered disposal facility; • Temporary fencing must be erected around batching plants in accordance with **Section 11.1.6: Fencing**.	
Project Specific Management Actions:	
None.	
Implementation:	
Responsible party:	The Contractor
Method of implementation:	• The contractor will ensure that all of the above management actions are complied with and implemented.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	The Contractor and ECO
Frequency:	Throughout the construction phase.
Evidence of compliance:	• The contractor to ensure compliance. • The ECO to provide details in environmental audit reports.

11.2.4. General aesthetics

Management Outcome:	General aesthetics: Neat and well-maintained site to minimise visual impacts.
Management Actions:	
• Any natural feature (e.g. rocks, etc.) situated on or around the site for survey or any other purposes shall not be defaced, painted, damaged or marked unless agreed beforehand with the ER. Any features affected by the Contractor or his subcontractors in contravention of this clause shall be restored and rehabilitated to the satisfaction of the ER. • All construction areas must be kept neat and tidy at all times. Different materials and equipment must be kept in designated areas and storing/stockpiling shall be kept orderly. • Site camp lighting must be minimal and cause the least visual impact at night. All light sources must be shielded so that only the area that needs to be lit is lit. No neon or backlit signage is to be allowed. No floodlights are permitted. Security lighting must be placed such that it is not a nuisance to residents and visitors to the area. Shields may be required to prevent lights from being visible from other parts of the protected area.	
Project Specific Management Actions:	
None.	
Implementation:	
Responsible party:	The Contractor
Method of implementation:	• The contractor will ensure that all of the above management actions are complied with and implemented. • The contractor will ensure that the site is neat and well-maintained.

Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	The Contractor and ECO
Frequency:	Throughout the construction phase.
Evidence of compliance:	• The contractor to ensure compliance. • The ECO to provide details in environmental audit reports.

11.2.5. Traffic accommodation

Management Outcome:	Traffic accommodation: Minimize traffic impact.
Management Actions:	
• The Contractor shall be required to ensure that traffic along public roads is accommodated at all times and construction activities and deliveries do not interfere with the public road system. Should there be a need to undertake such work that may impact traffic the Contractor will ensure that all the required permissions have been obtained from the traffic authorities in writing. All the required signage and hazard warnings are to be put in place. • The contractor will ensure that all drivers must be in possession of an appropriate and valid driver's licence. The Contractor is responsible for ensuring that all vehicles are road worthy. All relevant permits for abnormal loads must be applied for and obtained from the relevant authority as required. • Access points to and from site as well as roadways in front of the site are to be kept clean and free from stone, sand and grit. These areas must be swept regularly. • All construction vehicles, when on site and on the surrounding property, will not exceed the speed of 25km per hour. This is to ensure safety of vehicles, personnel, and the environment, and to lessen environmental degradation. Drivers who exceed the speed limit should be fined or dismissed by the Contractor or ER. • Access to the site must be gained at the designated areas as determined by the ER. As far as is possible use should be made of existing haul routes, tracks, and roads. The creation of short-cut paths/routes or temporary vehicular tracks is to be strictly prevented.	
Project Specific Management Actions:	
• Pathways and access roads must be routed away from the stream corridor and coastline. • The construction site and access pathways should avoid sensitive areas, which must be demarcated during the pre-construction phase. If lights are used, these should be directed away from the stream corridor and coastline. • All vehicles must be road-worthy and drivers must be qualified, made aware of the potential road safety issues, and need for strict speed limits.	
Implementation:	
Responsible party:	The Contractor
Method of implementation:	The contractor will ensure that all of the above management actions are complied with and implemented.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	ECO
Frequency:	Throughout the construction phase.
Evidence of compliance:	ECO to provide details in environmental audit reports.

11.2.6. Solid waste management

Management Outcome:	Solid waste management: Wastes are appropriately stored, handled and safely disposed of at a licensed waste facility.

Management Actions:

- The ER is responsible for ensuring that the contractor implements and adheres to the waste management requirements and all relevant legislation.
- The Contractor shall ensure that all facilities are maintained in a neat and tidy condition, and the site shall be kept free of litter. Measures shall be taken to reduce the potential for litter and negligent behaviour with regard to the disposal of all refuse. At all places of work the Contractor shall provide litterbins, containers and refuse collection facilities for later disposal.
- Solid waste may be temporarily stored on site in a designated area approved by the ER prior to collection and disposal. A containment structure may be created for this purpose, consisting of four ready fence panels covered with shade cloth, one panel to be movable for access and emptying. The structure will have a roof (plastic covered ready fence panel or similar to protect from the rain). The floor is to be lined with DPC plastic to prevent ground or soil contamination from waste residue. If a waste skip is to be used for this purpose it must be kept covered with shade cloth.
- Solid waste must be removed as often as required (when the containment area is full) or as instructed by the ER or ECO to a licensed waste disposal site. Recyclable waste should be separated and recycled if at all possible and opportunities provided on site to facilitate the collection of recyclable waste products. Staff should be trained in waste segregation and storage. Arrangements should be made with the relevant recycling companies for the transportation or collection for various wastes.
- Bins shall be covered, tip-proof, weatherproof and scavenger proof.
- No waste, including the cleared vegetation may be burned on the site and must be disposed of at an authorised waste disposal facility, unless it can be further beneficially utilised such as composting of the organic waste. Garden waste may be chipped on site.
- Used (empty) cement bags shall be collected and stored in weatherproof containers to prevent windblown cement dust and water contamination. Used cement bags shall not be used for any other purpose and shall be disposed of on a weekly basis via the solid waste management system.
- The contractor is responsible for ensuring that any sub-contractors on site manage and dispose of their waste in line with this EMP. The contractor will instruct all sub-contractors to follow waste management procedures.

- <u>Domestic Waste</u>
  - The Contractor shall provide refuse bins with lids to the satisfaction of the ER, for all construction areas. Refuse shall be collected and removed from all areas at least twice per week or as requested by the ER or ECO. Domestic waste shall be transported to the approved refuse disposal site in covered containers or trucks.

- <u>Construction Rubble / Waste</u>
  - Inert construction rubble shall be disposed of at a site approved by the ER. The ER will be responsible for ensuring that rubble is disposed of by the contractor at the site approved, and that the rubble can be legally disposed of at said site. Rubble stockpiles will be kept consolidated and at a reasonable size. Rubble will be removed regularly and/or at the request of the ECO.
  - Clean building rubble free from plastic, wood, wire metal, tar, asphalt or similar may be crushed and reused for specific purposes (e.g. road sub-base, concrete etc.) within the parameters set in the National Environmental Management: Waste Act 59 of 2008, (as amended) (NEM: WA). Rubble may not be buried on site for the sake of easy disposal.
  - All other solid waste or contaminated materials shall be disposed of offsite at an approved landfill site. The Contractor shall supply the ER with certificates of disposal or similar proof to indicate legal disposal. Copies of these will be provided to the ECO.

o Any crushing and reuse of clean building rubble must fall within the thresholds allowed in terms of the NEM: WA. All local by laws must be adhered to. Should the volumes and area required exceed these parameters a Waste Licence will be required in terms of the Act.	
Project Specific Management Actions:	
None.	
Implementation:	
Responsible party:	The Contractor
Method of implementation:	The contractor will ensure that all of the above management actions are complied with and implemented.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	The Contractor and ECO
Frequency:	Throughout the construction phase.
Evidence of compliance:	• The contractor to ensure compliance. • The ECO to provide details in environmental audit reports.

11.2.7. Hazardous waste management

Management Outcome:	Hazardous waste management: Hazardous wastes are appropriately stored, handled and safely disposed of at a licensed waste facility.
Management Actions:	
• All hazardous waste (including bitumen, old oil etc.) shall be disposed of at a DEA&DP approved hazardous landfill site (such as Visserhok), or hazardous waste facility, which is licensed to receive such waste. Alternatively, the contractor may appoint a reputable (the contractor must take steps to ensure that the waste contractor is legitimate and reputable) waste management service provider to remove and dispose of hazardous waste. • The Contractor must provide disposal certificates to the ER copies will be provided to the ECO. The ER will ensure that this process is followed by the contractor. • Under no circumstances shall the spoiling of tar or bituminous products on the site, over embankments, or any burying, be allowed. Unused or rejected tar or bituminous products shall be returned to the supplier's production plant or reputable recycler where practicable as an alternative to disposal. • Used oil, lubricants, cleaning materials, etc. from vehicles, machinery or bund areas shall be collected in holding tanks and sent back to the supplier or removed from site by a specialist oil recycling company as an alternative to disposal. • Once a purpose manufactured hydrocarbon spill remediation product has been used or has been used to treat contaminated materials (soil, rubble etc.) the resulting waste must be disposed of at a facility licensed to receive such waste.	
Project Specific Management Actions:	
None.	
Implementation:	
Responsible party:	The Contractor
Method of implementation:	The contractor will ensure that all of the above management actions are complied with and implemented.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	The Contractor and ECO
Frequency:	Throughout the construction phase.
Evidence of compliance:	• The contractor to ensure compliance. • The ECO to provide details in environmental audit reports.

11.2.8. Noise Control

Management Outcome:	Noise control: To prevent unnecessary noise to the environment by ensuring that noise from construction activity is mitigated, as far as possible.
Management Actions:	
• Operating hours as determined by the EA are adhered to during the development phase. Where not defined, development must be limited to daylight hours. • The Contractor shall be responsible for compliance with the Western Cape Noise Control Regulations, 2013 and all other relevant legislation with respect to noise. • All equipment and vehicles must be maintained to minimized noise from engines and ensure adherence to the Noise Regulations (SANS 10103). • The Contractor shall endeavour to keep noise generating activities to a minimum. • The Contractor shall endeavour to, as far as possible, warn any local communities and residents that could be disturbed by noise generating activities, such as blasting or piling, well in advance and shall keep such activities to a minimum. • Construction processes and machinery/vehicles with the lowest noise emission values available must be utilised. A well planned and co-ordinated "fast track" procedure must be implemented to complete the total construction process in the shortest possible time. • All plant, equipment and vehicles are to have effective silencers/mufflers fitted that would otherwise cause a noise level exceeding 85dB. Exhaust systems are to be in good repair with no holes in the piping. • No sound amplification equipment (hooters, loud music speakers, sirens etc.) is to be used on site except in emergencies. • Excessively noisy plant or plant requiring repairs are to be removed from site.	
Project Specific Management Actions:	
None.	
Implementation:	
Responsible party:	The Contractor
Method of implementation:	• The contractor will ensure that all of the above management actions are complied with and implemented. • The Contractor shall be responsible for compliance with the Western Cape Noise Control Regulations, 2013 and all other relevant legislation with respect to noise.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	The Contractor and ECO
Frequency:	Throughout the construction phase.
Evidence of compliance:	• The contractor to ensure compliance. • The ECO to provide details in environmental audit reports.

11.2.9. Dust Control

Management Outcome:	Dust control: Dust prevention measures are applied to minimise the generation of dust.
Management Actions:	
• The creating of nuisance/precipitant dust is controlled by the National Dust Control Regulations (R.827, 1 November 2013) promulgated under the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM: AQA). The contractor will ensure that the specifications of these regulations are met at all times.	

• Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO; • Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re- vegetated or stabilised as soon as is practically possible; • Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present; • During high wind conditions, the ECO will evaluate the situation and make recommendations as to whether dust damping measures are adequate, or whether working will cease altogether until the wind speed drops to an acceptable level; • Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind; • Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO; • Vehicle speeds must not exceed 40km/h along dust roads or 20km/h when traversing unconsolidated and non-vegetated areas; • Appropriate dust suppression measures must be used when dust generation is unavoidable, e.g. dampening with water; particularly during prolonged periods of dry weather in summer. Such measures must also include the use of temporary stabilising measures (e.g. chemical soil binders, straw, brush packs, chipping); • Straw stabilisation must be applied at a rate of one bale/10m² and harrowed into the top 100 mm of top material, for all completed earthworks; • For significant areas of excavation or exposed ground, spray water or wet areas using trucks to minimise the spread of dust.
Project Specific Management Actions:
• Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.

Implementation:	
Responsible party:	The Contractor
Method of implementation:	• The contractor will ensure that all of the above management actions are complied with and implemented. • The Contractor shall ensure that the generation of dust is minimised and shall implement a dust control programme.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	The Contractor and ECO
Frequency:	Throughout the construction phase.
Evidence of compliance:	• The contractor to ensure compliance. • The ECO to provide details in environmental audit reports.

11.2.10. Storm- and wastewater management

Management Outcome:	Storm- and wastewater management: To avoid pollution and erosion as a result of storm- or wastewater runoff.
Management Actions:	
• Wastewater from activities such as washing tools, batching and similar, will be collected in a drum or conservancy tank. This water may then be re-used for batching or for wetting and compacting sub-base material during road surfacing. • An impermeable sump lined with thick DPC plastic may be constructed by the Contractor in order to collect wastewater from batching and tool washing. The sump will be open to allow the water to evaporate. Care must be taken to ensure that input does not exceed the evaporation rate and that no overflow from the sump occurs. This is of particular importance during the wet season. Once	

the sump is dry the remaining material at the bottom of the sump will be disposed of with the general waste and rubble.

- Small volume wastewater collected from washing and other small volume cement work activities will be disposed of on top of the general rubble pile where it will be absorbed. This will be done in such a way as to ensure that there is no run-off from the rubble pile to surrounding areas. The wastewater shall not be of such volume that it will saturate the entire body of rubble or will soak through the rubble pile.
- Runoff from fuel depots / bunds / workshops / machinery washing areas and water contaminated with petro-chemicals and hydrocarbons shall be addressed as indicated in the hazardous waste section of this document.
- Water from kitchens, showers, sinks and toilets etc. shall be discharged into a conservancy tank for removal from the site or be plumbed into a sewer line if this is available.
- The ER's approval must be obtained by the contractor prior to the discharge of any contaminated water into sewer systems.
- At no point will wastewater from tool washing, batching, grouting, cleaning, showers, kitchens or similar sources be permitted to enter or be disposed of, *inter alia*, in the following manner:
  - Into a storm water system.
  - Directly onto bare soil.
  - Within 50m of a wetland.
  - Into a water course or on the bank of a water course.

Stormwater:

- The Contractor shall take reasonable measures to control the erosive effects of stormwater runoff during the construction phase. The Contractor shall use silt screens to prevent overland flow from causing erosion.
- Point source discharge of storm water must be prevented on slopes as this will lead to erosion of the unstable slope with loss of vegetation and resultant deep donga erosion. Any stormwater outlets must be constructed in such a manner as to ensure no soil or bank erosion takes place.
- The use of straw bales as filters, which are placed across the flow of overland stormwater flows, shall be used as an erosion protection measure. The ploughing-in of straw offers limited protection against storm water runoff-induced erosion and shall be used as an erosion protection measure. The Contractor shall be liable for any damage to downstream property caused by the diversion of overland storm water flows.
- Drip trays shall be used for all pumps, generators, etc. in order to prevent water contamination as a result of fuel spills or leaks.

Project Specific Management Actions:

- The proposed stormwater management system, if implemented in full, would adequately mitigate against the negative impacts associated with the generation, storage and discharge of stormwater on the site. It is understood that all stormwater generated by the development will be minimised at the point of accumulation, with only high discharge volumes and natural runoff being directed towards the watercourse and coastline.

Implementation:	
Responsible party:	The Contractor
Method of implementation:	The Contractor must ensure that wastewater is correctly managed on site to the satisfaction of the ER. The contractor will ensure that all sub-contractors comply with the requirements to manage wastewater on site.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	The Contractor and ECO
Frequency:	Throughout the construction phase.
Evidence of compliance:	• The contractor to ensure compliance. • The ECO to provide details in environmental audit reports.

11.2.11. Topsoil

Management Outcome:	Topsoil use: Impacts on the environment are minimised when topsoil is removed, and sufficient topsoil is available for rehabilitation.
Management Actions:	
Topsoil is considered to be the natural soil covering, including all the vegetation and organic matter. • Sufficient topsoil (up to 300 mm) must be stripped and stockpiled separately for the rehabilitation purposes of disturbed areas or landscaping on site after construction. • Any topsoil stripped from the site must be stockpiled separately from other materials. If not, enough topsoil is available after stripping, then additional topsoil must be acquired. Any acquired topsoil must be approved by the ER. • Stripped topsoil shall be stockpiled in areas agreed with the ER for later use in re-vegetation and shall be adequately protected. • As far as is practicable topsoil should not be stripped or stockpiled when it is wet or raining, in order to prevent unnecessary compaction. • Topsoil stockpiles shall be convex and no more than 2m high. Stockpiles shall be shaped so that no surface water ponding can take place. • Topsoil stockpiles shall be protected from erosion by wind and rain by providing suitable stormwater and cut off drains and/or by establishing suitable temporary vegetation. Stockpiles shall not be covered with materials such as plastic that may cause it to compost or would kill the seed bank. • Topsoil stockpiles shall be monitored regularly by the contractor to identify any alien plants, which shall be removed when they germinate to prevent contamination of the seed bank. • Any topsoil contaminated by hazardous substances shall not be used and shall be disposed of as per hazardous waste requirements of this document.	
Project Specific Management Actions:	
None.	
Implementation:	
Responsible party:	The Contractor
Method of implementation:	The Contractor shall be held responsible for the replacement, at his own cost, for any unnecessary loss of topsoil required for rehabilitation purposes due to his failure to work according to the approved method statements and the requirements of this EMPr.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	ECO
Frequency:	Throughout the construction phase.
Evidence of compliance:	ECO to provide details in environmental audit reports.

11.2.12. Stockpiling and stockpile areas

Management Outcome:	Stockpiling and stockpile areas: To reduce erosion and sedimentation as a result of stockpiling.
Management Actions:	
• The areas for the stockpiling of excavated and imported material shall be indicated and demarcated on the site plan submitted in writing to the ER for his approval together with the Contractor's proposed measures for prevention, containment, and rehabilitation against environmental damage; • All material that is excavated during the project development phase (either during piling (if required) or earthworks) must be stored appropriately on site in order to minimise impacts to watercourses, wetlands, and water bodies;	

• All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods; • No stockpiling of materials that could leach out and cause pollution may occur; • Stockpiles must not exceed 2m in height; • During periods of strong winds and heavy rain, the stockpiles should be covered with appropriate material (e.g. cloth, tarpaulin etc.); • Where possible, sandbags (or similar) should be placed at the bases of the stockpiled material in order to prevent erosion of the material. • Stockpiles shall be positioned and sloped to create the least visual impact; • No foreign material generated/deposited during construction shall remain on site on completion. Areas affected by stockpiling shall be reinstated to the satisfaction of the ER; • As dealt with under the dust control section (**Section 11.2.9**) of this document stockpiles may need to be covered as a dust control measure; • No stock piling will take place within 20m of the watercourse.
Project Specific Management Actions:
• Ensure that all building materials and equipment are stored at least 50m away from the watercourse corridor, as demarcated prior to construction. • Materials should be stored in piles that do not exceed 1.5m in height and should be protected from the wind, to prevent spread of fine materials across the site. • All soils and top material must be bought from a reliable source and must be free of alien seeds or alien grass runners.

Implementation:	
Responsible party:	The Contractor
Method of implementation:	The contractor will ensure that all of the above management actions are complied with and implemented.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	The Contractor and ECO
Frequency:	Throughout the construction phase.
Evidence of compliance:	• The contractor to ensure compliance. • The ECO to provide details in environmental audit reports.

11.2.13. Vegetation clearing

Management Outcome:	Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.
Management Actions:	
• No vegetation clearing shall take place without approval of the method statement by the ER. • No vegetation clearing shall take place until the site boundaries and "No-Go" areas are clearly demarcated or temporarily fenced off. • All litter and non-organic material must be removed from the area to be cleared before clearing of vegetation commence. • Vegetation clearing of the site must be limited as far as possible. • Vegetation clearing may not extend beyond the site boundary. If large areas are to be developed consideration should be given to a phased clearing approach to limit potential impacts resulting from large areas standing cleared for extended period of time. • Indigenous plant material can be removed from cleared areas and may be stockpiled for mulching. • Alien vegetation may be used for mulching if it is not in seed. • No waste, including the cleared vegetation may be burned on the site and must be disposed of at an authorised waste disposal facility, unless it can be further beneficially utilised such as composting of the organic waste. Garden waste may be chipped on site.	

• Permits may be required in order to remove or translocate protected plants or those of conservation concern and must be obtained prior to this happening.	
Project Specific Management Actions:	
The spread of alien plant species into the natural areas must be prevented and monitored.	
Implementation:	
Responsible party:	The Contractor
Method of implementation:	• The Contractor must ensure that all the management actions above are implemented. • The Contractor shall be responsible for informing all employees about the need to prevent any harmful effects on natural vegetation to be retained on the construction site or beyond the site boundaries as a result of their activities.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	ECO
Frequency:	Throughout the construction phase.
Evidence of compliance:	ECO to provide details in environmental audit reports.

11.2.14. Protection of fauna

Management Outcome:	Minimise disturbance to fauna.
Management Actions:	
• The Contractor shall ensure that no hunting, trapping, shooting, poisoning or otherwise disturbance of any fauna takes place. • The feeding of any wild animals is prohibited. No food or food products will be stored in such away so as to attract scavengers. • No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present; • The use of pesticides is prohibited unless approved by the ER. • No domestic pets are permitted on site. • Drainage structures (e.g. gutters, drains, sumps, ditches) must be designed, as far as possible, so that they do not act as pitfall traps for small creatures. They should either have gently sloping edges or be adequately covered to prevent creatures from falling into them.	
Project Specific Management Actions:	
• Any animals found during site preparation or construction must be recorded and handed to the ECO.	
Implementation:	
Responsible party:	The Contractor
Method of implementation:	The Contractor must ensure that all the management actions above are implemented.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	ECO
Frequency:	Throughout the construction phase.
Evidence of compliance:	ECO to provide details in environmental audit reports.

11.2.15. Protection of watercourses

Management Outcome:	Pollution and contamination of the watercourse environment as well as potential erosion are prevented.
Management Actions:	

• The stream corridor must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils, fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the Contractor's activities; • In the event of a spill, prompt action must be taken to clear the polluted or affected areas; • Appropriate rehabilitation and re-vegetation measures for the riverbanks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows.
Project Specific Management Actions:
• There is a 40m corridor demarcated around the stream. This corridor is a no-go area. • Any construction activities close to the stream cease during periods of heavy rain, to reduce the risks of contamination of the stream and ocean through rainfall and runoff. • The watercourse corridor must be well marked during the pre-construction phase.

Implementation:	
Responsible party:	The Applicant and Contractor
Method of implementation:	The Contractor must ensure that all the management actions above are implemented.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	ECO
Frequency:	Throughout the construction phase.
Evidence of compliance:	ECO to provide details in environmental audit reports.

11.2.16. Protection of heritage resources

Management Outcome:	Protection of heritage resources (if any): Impact to heritage resources is minimised

Management Actions:
• If any archaeological remains (including but not limited to fossil bones and fossil shells, coins, indigenous and/or colonial ceramics, any articles of value or antiquity, stone artefacts and bone remains, structures and other built features, rock art and rock engravings) are discovered during construction they must immediately be reported to HWC and must not be disturbed further until the necessary approval has been obtained from HWC. • Should any human remains/burial or archaeological material be disturbed, exposed or uncovered during construction, these should immediately be reported to the South African Heritage Resources Agency (021 462 4502) and Heritage Western Cape (021 483 9685). The ECO and ER are also to be informed. An archaeologist will be required to remove the remains at the expense of the Applicant. • The Contractor may not, without a permit issued by the relevant heritage resources authority, destroy damage, excavate, alter, deface or otherwise disturb archaeological material.
Project Specific Management Actions:
• Radio-carbon dating is required for sites Ci03 and Ci18 as identified in the Archaeological assessment. • As burials may be present on the broader site, a protocol should be in place for dealing with the remains, particularly during the construction phase of the project.

Implementation:	
Responsible party:	The Contractor
Method of implementation:	The Contractor must ensure that all the management actions above are implemented.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	ECO

Frequency:	Throughout the construction phase.
Evidence of compliance:	ECO to provide details in environmental audit reports.

11.2.17. Emergency procedures

Management Outcome:	Emergency procedures: Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.

Management Actions:

- Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project;
- The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation. On-site emergency plans must be reviewed regularly;
- All staff must be made aware of emergency procedures as part of environmental awareness training;
- The relevant local authority must be made aware of a fire as soon as it starts;
- In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented (see **Section 11.2.2: Storage, handling, use and disposal of hazardous substances**).
- The applicant must ensure that "Any emergency incident, originating at the facility, which falls within the definition of section 30(1) of NEMA, must be dealt with by the facility in accordance with Section 30 of NEMA". In the event of any incident the facility must ensure containment by the responsible person and report the incident to DEA&DP.

- <u>Spills and Leaks</u>
  - Any significant spills and leaks of oil, petrol or diesel from fuel storage areas must be immediately reported to the operations manager and environmental control officer onsite;
  - In the event that a significant spillage/leakage of product and/or hazardous substances is released onto land or into water resources, the following procedures must be followed:
    - The spillage or leakage must immediately be contained, followed by the appropriate clean-up and remediation of the affected area;
    - In the event of a significant spill or leak of hazardous substances (petrol, diesel, cement, etc.) used during the construction or operational phases, such incident must be reported to all relevant authorities, including the D: PCM in accordance to Section 30 (10) of the NEMA, pertaining to the control of emergency incidents.
  - The contractor shall ensure that his employees are aware of the procedure to be followed for dealing with spills and leaks, which shall include notifying the, ER and ECO. The Contractor shall ensure that the necessary spill response / hydrocarbon remediation materials (e.g. chemcap, spill-sorb, drizzat pads, enretech, OilCap and peat moss) and equipment for dealing with spills and leaks are available on site at all times. The source of the spillage shall be isolated. The Contractor shall contain the spillage using sand berms, sandbags, pre-made booms, sawdust or absorbent materials. Treatment and remediation of the spill areas shall be undertaken to the reasonable satisfaction of the ER.
  - The Contractor shall submit his emergency procedure (to be detailed in **MS9**) prior to bringing on site any such substances.
  - All spills or accidents involving such materials are to be recorded by the Contractor. The Contractor is responsible for ensuring that these records are submitted to the ECO. The clean-up of spills and any damage caused by the spill shall be for the Contractor's account.

Project Specific Management Actions:

None.

Implementation:

Responsible party:	The Applicant & Contractor
Method of implementation:	• The applicant must ensure that "Any emergency incident, originating at the facility, which falls within the definition of section

	30(1) of the National Environmental Management Act (NEMA), Act 107 of 1998, must be dealt with by the facility in accordance with Section 30 of NEMA". • The contractor will ensure that all of the above management actions are complied with and implemented. • The Contractor shall take all reasonable steps to avoid increasing the risk of spills and leaks activities on site.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	The Contractor and ECO
Frequency:	Throughout the construction phase.
Evidence of compliance:	• The contractor to ensure compliance. • The ECO to provide details in environmental audit reports.

11.2.18. Fire Prevention

Management Outcome:	Fire Prevention: Prevention of uncontrollable fires.
Management Actions:	
• The Contractor shall ensure that basic fire-fighting equipment is available at all construction areas and facilities. The workforce should be appropriately trained in the use of all equipment. • Smoking shall not be permitted in those areas where it is a fire hazard. Such areas shall include any workshop and fuel storage areas and areas where the vegetation or other material may promote the rapid spread of an initial flame. A fire extinguisher of the appropriate type must be present when welding or other "hot" activities are undertaken. • In terms of the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965), burning is not permitted as a disposal method. • The Contractor shall appoint a fire officer who shall be responsible for ensuring immediate and appropriate action in the event of a fire. The Contractor shall ensure that all site personnel are aware of the procedure to be followed in the event of a fire. • Any work that requires the use of fire or open flame may only take place at a designated area approved by the ER and must be supervised at all times. Serviced fire-fighting equipment shall be available. • It is recommended that, if cooking is to take place on site, purpose made gas cookers be considered before the use of cooking fires. No fires are to be made on site, unless situated in a designated and demarcated area approved by the ER away from high-risk areas and in a contained fireplace (not on the bare ground). Fire extinguisher will always be in this area. Under no circumstances will there be more than one fire on the site at a time, or for the fire to be left unattended. The contractor will also consider the prevailing weather conditions. • Wood and branches will not be harvested from site as fuel.	
Project Specific Management Actions:	
• Contractors must ensure that open fires on the site for cooking or heating are not allowed except in designated areas. • Contractors must ensure that construction related activities that pose a potential fire risk, such as welding etc., are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include clearing working areas and avoiding working in high wind conditions when the risk of fires is greater. In this regard special care must be taken during the high-risk dry, windy summer months. • Contractors must provide adequate firefighting equipment on-site; • Contractors must provide fire-fighting training to selected construction staff; • In the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate property owners, including farmers, for any damage	

caused to their properties and losses incurred. The contractor should also compensate the firefighting costs borne by farmers and local authorities.	
Implementation:	
Responsible party:	The Contractor
Method of implementation:	• The contractor will ensure that all of the above management actions are complied with and implemented. • The Contractor shall take all reasonable steps to avoid increasing the risk of fire through activities on site.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	The Contractor and ECO
Frequency:	Throughout the construction phase.
Evidence of compliance:	• The contractor to ensure compliance. • The ECO to provide details in environmental audit reports.

11.2.19. Site safety and security

Management Outcome:	Site safety and security: All safety and security measures are in place.
Management Actions:	
<u>Construction site:</u> • The construction site should be secured against unauthorised entry. • All personnel must be adequately trained and informed in the tasks that they are expected to perform. This is required for their own safety as well as the safety of colleagues and other interested and/or affected parties. • Construction workers will be supervised on site during the development phase. • No unauthorised personnel shall be allowed onto site. • All personnel must be transported to and from site daily. • The movement of all personnel on site must be monitored through a rollcall system. • No personnel, except for security personnel may are allowed to stay overnight on site. • Adequate fencing needs to be provided around the site. Fencing needs to be checked and maintained during the construction phase. • The contractor must ensure that his equipment is protected. • Solid and construction waste should not accumulate on site as this could attract rodents and also poses a safety hazard. • All excavated areas and/or holes should be clearly demarcated. • Maintain environmental incidents register in which all environmental incidents (e.g. accidental spillages etc.) are logged.	
Project Specific Management Actions:	
• For the bulk services phase, the construction workers will be required to stay in a facility located to the west of the site on the Applicant's property during the week. No construction workers will be permitted to stay in the facility over weekends. The contractor must transport all construction workers to their homes on Friday afternoon and back to site on Monday morning. The duration of the bulk services phase will be 4-6 months. • Construction activities should not be permitted over weekends, specifically long weekends (such as the Easter Weekend) and the December school holidays, specifically the period 14 December to 6 January. This is to reduce the impact on those people who live in Infanta permanently and or who visit the area over weekends and holiday times.	
Implementation:	
Responsible party:	The Contractor

Method of implementation:	• The Contractor shall at all times observe the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and ensure adequate safety precautions on the site. • The contractor will be responsible for the supervision of construction personnel on site during the construction phase.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	The Contractor and ECO
Frequency:	Throughout the construction phase.
Evidence of compliance:	• The Contractor must keep record of all construction personnel on site. • ECO to provide details of any safety or security incidents in environmental audit reports.

11.2.20. Public safety

Management Outcome:	Public safety: All precautions are taken where possible to minimise the risk of injury, harm or complaints.
Management Actions:	
• Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential threats e.g. fuels etc.; • All unattended open excavations must be adequately fenced or demarcated; • Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed structures and protective scaffolding; • Ensure structures vulnerable to high winds are secured; • Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged.	
Project Specific Management Actions:	
• For the bulk services phase, the construction workers will be required to stay in a facility located to the west of the site on the Applicant's property during the week. No construction workers will be permitted to stay in the facility over weekends. The contractor must transport all construction workers to their homes on Friday afternoon and back to site on Monday morning. The duration of the bulk services phase will be 4-6 months. • The contractors appointed by the Applicant and individual homeowners must ensure that all workers employed on the project are informed at the outset of the construction phase that any construction workers found guilty of poaching and or theft will be dismissed and charged. All dismissals must be in accordance with South African labour legislation. In addition, with the exception of security personnel, no construction workers should be allowed to remain on the site over weekends. The contractor should make necessary arrangements to transport workers to and from the area on a weekly basis.	
Implementation:	
Responsible party:	The Contractor
Method of implementation:	• The Contractor shall at all times observe the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and ensure adequate safety precautions on the site. • The contractor will be responsible for the supervision of construction personnel on site during the construction phase.
Timeframe for implementation:	Throughout the construction phase.
Monitoring:	
Responsible person:	The Contractor and ECO
Frequency:	Throughout the construction phase.

Evidence of compliance:	• The Contractor must keep record of all construction personnel on site. • ECO to provide details of any safety or security incidents in environmental audit reports.

11.2.21. Landscaping and rehabilitation

Management Outcome:	Landscaping and rehabilitation: No environmental degradation occurs as a result of the development.

Management Actions:

- The Contractor shall ensure that all temporary structures, equipment, materials, waste and facilities used for construction activities are decommissioned and removed upon completion of the activity. The Contractor shall clear and clean the construction site to the satisfaction of the ER upon completion of the construction.
- The contractor will undertake all rehabilitation of areas disturbed as a result of activities on site to the satisfaction of ER. Expenses incurred in rehabilitating the site shall be for the Contractor's account. The estimated cost of rehabilitation will be provided to the Contractor prior to the work commencing.
- The Contractor will be responsible for any costs resulting from rehabilitation required due to non-compliance with this EMPr.
- It may be necessary to obtain specialist (e.g. botanical, horticultural etc.) input prior to undertaking the required rehabilitation.
- No invasive plant species should be introduced to the site. All invasive alien species should be eradicated from the disturbed sites. Non-indigenous and non-endemic species are permitted. Landscaping is to be done in accordance with the landscaping master plan, to be drafted by a registered landscape architect.
- All areas disturbed by construction activities within the demarcated site, storage and stockpiling areas, etc. shall be rehabilitated and/or landscaped to the satisfaction of the ER.
- The need for vegetation rehabilitation, resulting from the contractor's non-compliance with the EMPr, will be for the contractors account and will be carried out to the satisfaction of the ER.
- "No-Go" areas or areas outside of the approved demarcated site will be rehabilitated with the intention of restoring the area to the same or better condition that it was before the disturbance occurred. Only locally indigenous plants will be used. Where required the necessary specialist must be appointed to oversee and advise on the rehabilitation process.
- Re-vegetation of site areas shall take place in accordance with the Landscaping Plan as soon as possible after completion of construction works. The timing of re-vegetation shall take cognisance of maintenance requirements and provision shall be made for any irrigation requirements.
- No construction equipment, vehicles or unauthorised personnel shall be allowed onto areas that have been re-vegetated.

Mulch:

- Mulch shall be used in all areas where re-vegetation must take place. Mulch may be obtained from all areas where vegetation is cleared.
- Mulch shall be free of alien seed.
- Where possible indigenous plant material cleared from the site shall be reduced by either mechanical means (chipper) or by hand-axing to pieces no longer than 100mm.
- No harvesting of mulch vegetation outside of construction areas shall be allowed.
- Every effort shall be taken to ensure the retention of as much seed as possible in mulch made from indigenous vegetation and mulches shall be collected in such a manner that the loss of seed is restricted.
- Bush-cut mulch shall be stored for as short a time-period as possible, and seed released from stockpiles shall be collected for use in re-vegetation.
- Compost from an organic source may be used as mulch during re-vegetation but must be approved by the ER. Compost shall be well decayed, friable and free from weed seeds.

- Weed free, half-composted material, such as milled-bark, may be used as an additive to extend indigenous mulch. As far as possible, no more than 50% compost shall be used under these circumstances.
- Wood chips (including bark), which are half composted and have not been treated with preservatives can also be used as mulch during re-vegetation. Chips shall be no longer than 50mm in length or breadth and the ER shall approve the source of the chips.

Ground surface preparation:

- The ER will ensure during the planning phase that all rehabilitation required will be done in accordance with the EA and will be indigenous and water wise.
- Prior to re-vegetation, the Contractor shall ensure that the area is clear of any building materials, residues and other foreign debris.
- All visible weeds shall be removed from the area before replacing topsoil where required.
- Compacted soil shall be ripped along the contour and hand-trimmed. Topsoil shall then be spread evenly over the surface if required.
- The final prepared ground surface shall be furrowed to follow the natural slope contours of the land and not smooth.

Plant/Trees:

- All re-vegetation of disturbed areas will be done with locally indigenous plants, in accordance with the Landscaping Plan.
- Where the ER or Contractor is unsure of suitable plants to be used, input should be sought from a suitably experience horticulturist, aquatic ecologist, or botanist for input in this regard.
- The Contractor shall ensure that each plant / tree is handled and packed in the approved manner for that species or variety, and that all necessary precautions are taken to ensure that the plants arrive on site in a proper condition for successful growth.
- Plants shall be protected from wind during transportation.
- There shall be sufficient topsoil around each plant to prevent desiccation of the root system.

Timing:

- Re-vegetation of disturbed construction areas shall take place as soon as possible after construction work is completed.
- As much as is possible, re-vegetation shall take place at the start of the winter rains to maximise water availability and minimise the need for watering.
- If re-vegetation takes place during the dry season, irrigation of planted areas may be necessary.

Establishment of Vegetation:

i. *Irrigation*

- The Contractor shall be responsible for maintaining the desired level of irrigation necessary to maintain vigorous and healthy growth, as advised by the appointed landscaping contractor or horticulturist.
- Water used for the irrigation of re-vegetated areas shall be free of chlorine and other pollutants that will have a detrimental effect on the plants.
- Where an irrigation system is required, the Contractor shall be responsible for its installation prior to seeding or planting. The Contractor shall supply all required water as well as all equipment as required by the approved method statement.
- Every effort shall be made to avoid irrigation overspray into "no-go" areas and other areas with natural vegetation as well as hard surfaced areas where the water is wasted.

ii. *Weed, diseases and pest control*

- The Contractor shall be responsible for ensuring that all re-vegetated areas remain free of all invasive alien and indigenous weed species during the contract and establishment period.
- Weeding, removal methods and storage of this material shall be undertaken in such a manner that prevents the re-infestation of the cleaned areas.

• All dead plant material shall be removed immediately as it may become a fire hazard. • The Contractor shall ensure that all plants are disease and pest free. Any methods used to control any diseases or pests, including the use of herbicides and pesticides, must be approved by the ER.	
Project Specific Management Actions:	
• The stream corridor should be planted with appropriate indigenous vegetation, where necessary, and a barrier provided between landscaped areas (gardens or roadsides) and the corridor (e.g. a pathway). • Kikuyu grass should not be allowed on the site. • Road reserves can be grassed with indigenous species such as *Cynodon dactylon* (kweekgras). • The spread of alien plant species into the natural areas must be prevented and monitored.	
Implementation:	
Responsible party:	The Contractor
Method of implementation:	The contractor will ensure that all of the above management actions are complied with and implemented.
Timeframe for implementation:	After the construction works ended.
Monitoring:	
Responsible person:	The Contractor and ECO
Frequency:	After the construction works ended.
Evidence of compliance:	• The contractor to ensure compliance. • The ECO to provide details in environmental audit reports.

11.3. OPERATIONAL MANAGEMENT PLAN

The Operational Phase of this EMPr refers to the day-to-day management activities that are required to ensure sustainability and the achievement of the principles and objectives of the development. The requirements are applicable to the proponent, all employees, and all visitors to the property.

11.3.1. Groundwater monitoring

Management Outcome:	Public safety: All precautions are taken where possible to minimise the risk of injury, harm or complaints.
Management Actions:	
• The monitoring as recommended in the geohydrological report should be established prior to operation. • The water level monitoring should be conducted weekly for the first three months of operation and if no significant water level decline is observed, the monitoring can be conducted on a monthly basis. Alternatively, automatic water level measurement in the form of pressure transducers can be installed to aid in this process. Logs of flow meter readings should also be kept and the flowmeter should also be read once per month. • A rainfall gauge should be installed on the site and rainfall readings should be taken after every rainfall event and the time and date of the reading recorded. • The monitoring data (water levels, rainfall and chemistry) should be kept in an electronic database for further analysis should this be required. • The recommended pump cycle for the borehole is 12 hours per day. If the pump cycle is to be extended, the maximum daily volume for each borehole must not be exceeded and the pumping rate must be reduced to sustainable rates. • It is recommended that the hydrocensus be repeated once every 2 years to ensure that no new groundwater users are affected. The hydrocensus should extend to a 1km radius around the site boundary. • The regional groundwater table must be maintained to ensure that Schedule 1 water users adjacent to the site have adequate water supply to basic human need.	

• Follow up sampling during use of the borehole will be required to determine the continued suitability of the potable treatment process.	
Implementation:	
Responsible party:	The HOA will be responsible for seeing that the groundwater monitoring measures are implemented.
Method of implementation:	The HOA will be responsible to appoint suitable person to undertake the groundwater monitoring and conduct follow up sampling.
Timeframe for implementation:	Throughout the operation phase.
Monitoring:	
Responsible person:	Groundwater consultant.
Frequency:	Throughout the operation phase as recommended by the groundwater assessment.
Evidence of compliance:	The HOA will need to keep record of all monitoring results. The monitoring results will need to be provided during the operational audit.

11.3.2. Alien vegetation control

Management Outcome:	Ensure that alien vegetation clearing is implemented.
Management Actions:	
a) The limestone fynbos conservation area should be totally cleared from all invasive alien plants (especially Acacia cyclops). and to implement constant monitoring to ensure no further invasion of the site by such species b) Clearing of the alien vegetation along the watercourse within the property should also be undertaken. c) Clearing should be undertaken in such a manner to retain existing indigenous vegetation. d) Identify alien plants to be removed. If unsure, please contact the Department of Agriculture or CapeNature for assistance. e) Clear alien vegetation according to the described alien vegetation removal methods for each invasive species as provided in the detailed method statements or with the methods and herbicides/biological control recommended on the Working for Water website: https://www.dffe.gov.za/projectsprogrammes/wfw; f) Where necessary revegetate cleared areas with suitable indigenous vegetation. Planted areas may require irrigation and care for 1-2 years following planting. Planting of the new vegetation at the start of the wet season can assist in ensuring that the new vegetation is kept wet however one would need to then avoid planting new vegetation within the areas that will be inundated in winter or subjected to flood flows; an g) Ongoing monitoring and clearing of the regrowth of alien plants within these areas will be required. This will ensure that the plants are removed while still young saplings that can more easily be removed (usually pulling of seedlings by hand is possible when the soil is wet). This also prevents the spread of the alien plants once seeds have been produced.	
Implementation:	
Responsible party:	The Holder of the EA
Timeframe for implementation:	Throughout the development's lifespan.
Monitoring:	
Method of monitoring:	The Holder of the EA must ensure that all the management actions above are implemented.
Frequency of monitoring:	As per the requirements of the competent and/or local authorities.
Mechanism for monitoring compliance:	As per the requirements of the competent and/or local authorities.

11.4. CONSTRUCTION OF INDIVIDUAL HOUSES

The construction of individual houses must adhere to the requirements of the House CEMP included under **Appendix H** of this EMPr. The individual homeowners must comply with the House CEMP, and the HOA must oversee compliance with the House CEMP.

A copy of the House CEMP shall be issued to each builder at the tender stage to allow for costs of implementing the conditions of this CEMP to be included in the building costs. This will also ensure that each builder is aware of his responsibilities prior to commencing work.

Copies of the CEMP must be available to each Site Foreman, who will be required to familiarise him/herself with the contents of the document and ensure that procedures are followed accordingly.

Each Builder will be contractually bound to abide by the specifications of the CEMP, as well as Appendices and any amendments thereto.

Refer to the House CEMP included under **Appendix H** of this EMPr.

11.5. DECOMMISSIONING MANAGEMENT PLAN

When decommissioning is undertaken, all relevant legislation and policies must be complied with for the given period.

In general, in the future event that the facility be decommissioned, the following must be undertaken:

- Only identified structures must be removed within a demarcated area to prevent unnecessary damage to the surrounding area;
- Materials that can be recycled must be correctly sorted and stacked for removal to appropriate waste stream sites;
- The footprint area of the facility must be rehabilitated.

A Demolition Certificate must be obtained from the relevant authority prior (i.e. Local Municipality) to demolition commencing.

12. COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS

The EMPr forms part of the Contract Documentation and is thus a legally binding document. It is also necessary for the Contractor to make provisions as part of their budgets for the implementation of the EMPr. In terms of NEMA an individual responsible for environmental damage must pay costs both to the environment and human health and the preventative measures to reduce or prevent additional pollution and/or environmental damage from occurring. This is referred to as the Polluter Pays Principle, Section 28 of the NEMA embodies the polluter pays principle.

The Applicant is responsible for, and required to, directly notify DEA&DP within 24 hours of any non-compliance that has occurred on the site.

12.1. PROCEDURES

The Contractor shall comply with the environmental specifications and requirements on an on-going basis and any failure on his part to do so will entitle the ER to impose a penalty.

In the event of non-compliance, the following recommended process shall be followed:

- The ER shall issue a **notice of non-compliance** to the Contractor, stating the nature and magnitude of the contravention. A copy shall be provided to the ECO.
- The Contractor shall **act to correct the transgression** within 24 hours of receipt of the notice, or within a period that may be specified within the notice.
- The Contractor shall provide the ER with a **written statement** describing the actions to be taken to discontinue the non-conformance, the actions taken to mitigate its effects and the expected results of the actions. A copy shall be provided to the ECO.
- In the case of the Holder of the EA failing to remedy the situation within the predetermined time frame, the ER shall impose a monetary penalty based on the conditions of contract.
- In the case of non-compliance giving rise to physical environmental damage or destruction, the ER shall be entitled to undertake or to cause to be undertaken such **remedial works** as may be required to make good such damage and to recover from the Contractor the full costs incurred in doing so.
- In the event of a dispute, difference of opinion, etc. between any parties in regard to or arising out of interpretation of the conditions of the EMP, disagreement regarding the implementation or method of implementation of conditions of the EMP, etc. any party shall be entitled to require that the issue be referred to the **specialists and / or the competent authority** for determination.
- The ER shall at all times have the right to **stop work** and/or certain activities on site in the case of non-compliance or failure to implement remediation measures.

12.2. OFFENCES AND PENALTIES

Any avoidable non-compliance with the conditions of the EMP shall be considered sufficient ground for the imposition of a penalty.

Possible offences, which should result in the issuing of a contractual penalty, include, but are not limited to:

- Unauthorised entrance into no-go areas.
- Catching and killing of wild animals.
- Unauthorised damage to natural vegetation.
- Unauthorised camp establishment, including stockpiling, storage, etc.
- Hydrocarbons or hazardous material: negligent spills or leaks and insufficient storage.
- Ablution facilities: non-use, insufficient facilities, insufficient maintenance.
- Late method statements or failure to submit method statements.
- Insufficient solid waste management, including clean-up of litter, unauthorised dumping etc.
- Erosion due to negligence or non-performance.
- Excessive cement or concrete spillage or contamination.

- Insufficient fire control and unauthorised fires.
- Non-induction of staff.

12.2.1. Indicative List of Penalties

Penalties will be issued for the transgressions listed in the table below. Penalties may be issued per incident at the discretion of the ER and to a maximum as indicated below. Such penalties will be issued in addition to any remedial costs incurred because of non-compliance with the environmental requirement.

The ER will inform the Contractor of the contravention and the amount of the fine and will deduct the amount from monies due under the Contract. Such fines will be paid by the Contractor to the Applicant. The monies will be deducted under the contract value. The Applicant is responsible for the implementation of the EMPr and for compliance monitoring of the EMPr. The EMPr will be made binding on all contractors (including sub-contractors) operating on the site and will be included with the Contract. Non-Compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

Spot penalties for the activities detailed below, will be imposed by the ER on the Contractor and/or his Sub-contractors.

Possible transgressions		Recommended Penalty
1	Unauthorised entrance into no-go areas.	R7 000 – R15 000
2	Unauthorised persons walking outside the demarcated boundaries of the site	500 – R1 500
3	Activities unauthorised by the ER outside the demarcated boundaries of the site.	R5 000 – R10 000
4	Unauthorised damage (disturbance) to natural vegetation or damage to natural vegetation due to negligence or non-compliance with the requirements of the EMPr (Please note rehabilitation may also be required)	R7 000 – R18 000
5	Failure to suitably demarcate and maintain demarcations of "No-Go" areas or to do so timeously	R1 500 – R5 000
6	Failure to suitably demarcate and maintain demarcations of the site boundaries as agreed with by the ER areas or to do so timeously	R1 000 – R3 000
7	Persons collecting firewood outside the demarcated boundaries of the site	R500 – R1 500
8	Any vehicle being driven, and items of plant or materials being parked or stored outside the demarcated boundaries of the site	R5 000 – R10 000
9	Catching, trapping, intentional killing, disturbing, feeding of wild animals, reptiles or birds.	R1 000 – R3 000
10	Erosion due to negligence or non-performance or failure to control erosion. (Please note rehabilitation may also be required)	R1 500 – R5 000
11	Late method statements or failure to submit method statements.	R1 500 – R3 000
12	Failure to adhere to approved method statements	R2 500 – R7 000
13	Unauthorised camp establishment, including stockpiling, storage, etc.	R2 500 – R5 000
14	Insufficient fire control and unauthorised fires.	R2 500 - R20 000
15	Site environmental file not properly maintained: no copy of EA or EMPr, approved method statements not on file, ECO reports not on file etc.	R1 500 – R3 000
16	Failure to maintain a complaint register on site or failure to address/respond to complaints	R1 000 – R1 500
17	Failure to follow temporary shutdown procedures	R6 000 – R8 000
18	Any vehicle driving in excess of designated speed limits	R500 - R1 000
19	Improper storage/stockpiling of materials on site, or storage/stockpiling in unsuitable areas.	R250 - R1 000

20	Hydrocarbons or hazardous materials: negligent spills or leaks and insufficient storage, no hydrocarbon remediation product on site.	R1 000 - R5 000
21	Persistent and un-repaired oil leaks from machinery. The use of inappropriate methods of refuelling such as the use of a funnel rather than a pump, no drip tray etc.	R2 000 - R10 000
22	Litter on site	R500 – R4 000
23	Insufficient solid waste management, unauthorised dumping, poor waste containment etc.	R2000 – R8 000
24	Failure to supply proof (invoices, waybills) of correct waste disposal on request	R2 000 – R7 000
25	Excessive cement or concrete spillage or contamination.	R2000 – R5 000
26	Cement / concrete mixing being done on bare soil and failure to manage water runoff from batching areas	R1 500 – R5 000
27	Wastage of water: leaking pipes and taps, proper taps or valves not fitted to pipes, taps or hoses left running, irrigating outside of permitted hours etc.	R500 – R2 000
28	Poor or improper wastewater management, washing of tools directly onto the ground.	R500 – R3 000
29	Failure to mitigate activities resulting in pollution or sedimentation of water resources (Please note rehabilitation may also be required)	R8 000 – R35 000
30	The eating of meals on site outside the defined eating area.	R200 - R1 000
31	Excess or unnecessary noise on or emanating from site	R500 - R1500
32	Failure to implement sufficient dust control measures.	R4 000 – R6 000
33	Any person, vehicle, item of plant, or anything related to the Contractors operations causing a public nuisance	R1 000 - R9 000
34	Ablution facilities: non-use, insufficient facilities, insufficient maintenance	R500 - R1 000
35	Unauthorised activities outside of permitted working times	R2 000 - R10 000
36	Failure to notify ER / ECO of activities or impacts that may affect the environment	R2 000 - R4 000
37	Any other contravention of an EMPr specification or any condition of an environmental nature or instruction from ER.	Variable Up to R50 000
38	Commencing construction activities without an ECO on site.	Variable up to R10 000 per month

For each subsequent similar offence, the fine may be doubled in value to a maximum value of R100 000.

The ER may also stop works.

12.2.2. Other penalties

Where the Contractor inflicts non-repairable damage upon the environment or fails to comply with any of the environmental specifications, he/she shall be liable to pay a penalty fine over and above any other contractual consequence. In terms of the Conventional Penalties Act, 1962 (Act No. 15 of 1962), a creditor is not entitled to recover both the penalty and damages. Accordingly, where a Contractor causes damage, the Employer can either enforce a penalty or make the Contractor make good the damage, but not both.

The Contractor is deemed NOT to have complied with this Specification if:

a. within the boundaries of the site, site extensions and haul/ access roads there is evidence of contravention of the Specification;
b. environmental damage ensues due to negligence;
c. the Contractor fails to comply with corrective or other instructions issued by the ER within a specific time; and

d. the Contractor fails to respond adequately to complaints from the public.

Payment of any fines in terms of the contract shall not absolve the offender from being liable from prosecution in terms of any law.

The following penalties are suggested for transgressions:

a. Erosion	A penalty equivalent in value to the cost of rehabilitation plus 20%.
b. Oil spills	A penalty equivalent in value to the cost of clean-up operation plus 20%.
c. Damage to indigenous vegetation	A penalty equivalent in value to the cost of restoration plus 20%.
d. Damage to sensitive environments	A penalty equivalent in value to the cost of restoration plus 20%.
e. Damage to cultural sites	A penalty to a maximum of R 100 000.00 shall be paid for any damage to any cultural/ historical sites.
f. Damage to trees	A penalty to a maximum of R100 000.00 shall paid for each tree removed without prior permission, or a maximum of R5 000.00 for damage to any tree, which is to be retained on site.
g. Penalties for removing or damaging trees:	

Girth of trunk (1m above ground level)	Replacement value per tree
0 – 15 mm	R300.00
16 – 30 mm	R600.00
31 – 50 mm	R1 000.00
51 – 75 mm	R2 000.00
76 – 100 mm	R4 000.00
101 – 150 mm	R10 000.00
150 – 300 mm	R15 000.00
Larger than 300 mm	R20 000.00 to R100 000.00

APPENDICES

APPENDIX A: **LOCALITY PLAN(S)**

APPENDIX B: **SITE PLAN**

APPENDIX C: **METHOD STATEMENT – EXAMPLE TEMPLATE**

APPENDIX D: **ENVIRONMENTAL AWARENESS MATERIAL**

APPENDIX E: **TEMPORARY SHUTDOWN CHECKLIST**

APPENDIX F: **EAP CV**

APPENDIX G: **AUTHORISATIONS AND PERMITS**

Appendix G1: Environmental Authorisation

APPENDIX H: **HOUSE CONSTRUCTION CEMP**

APPENDIX A - CAPE INFANTA LOCALITY

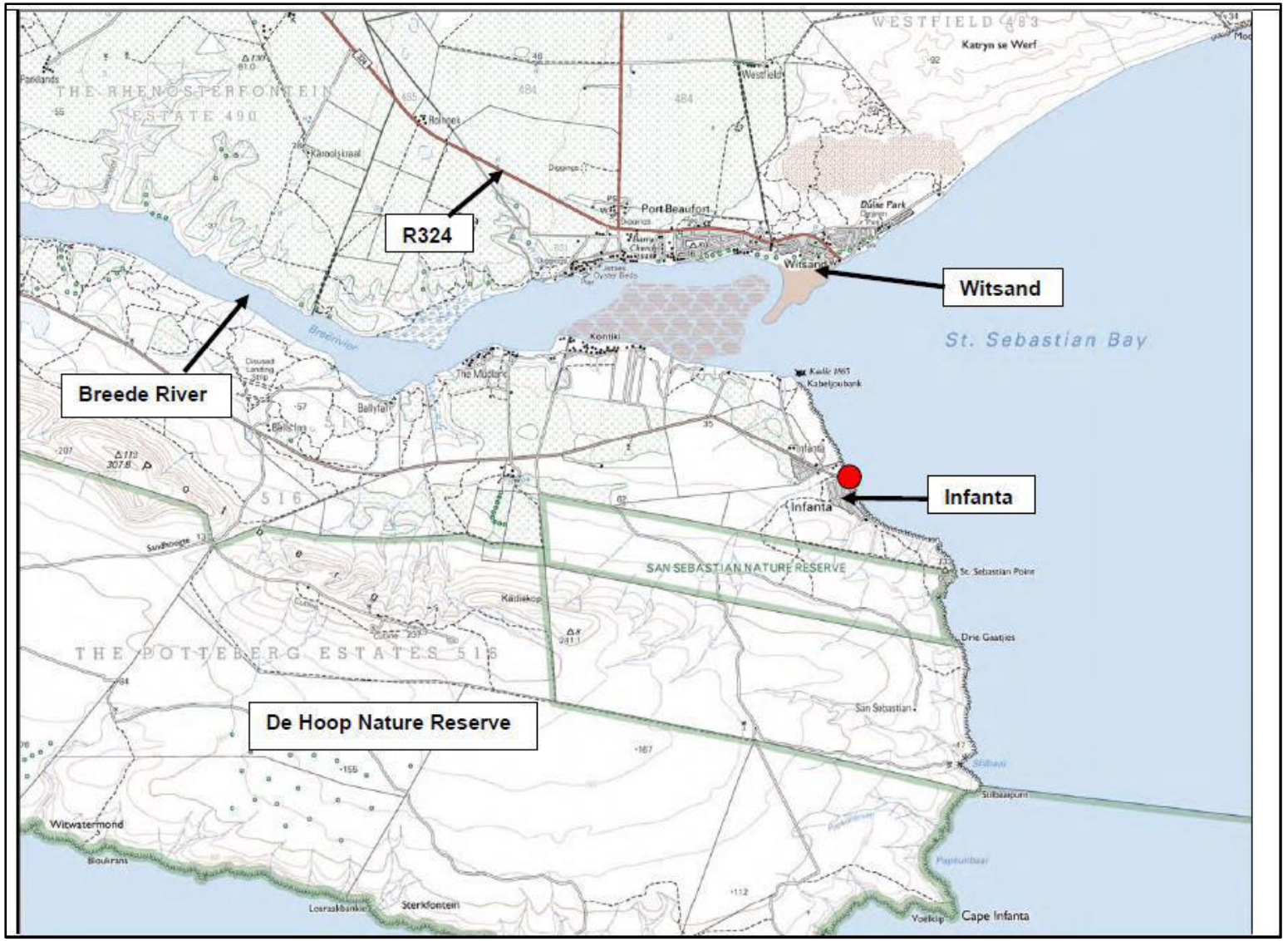


Figure 1: Location of Erf 134 in proximity to Infanta

Figure 2: Location of Erf 134 in proximity to Infanta

Figure 3: Location of application site

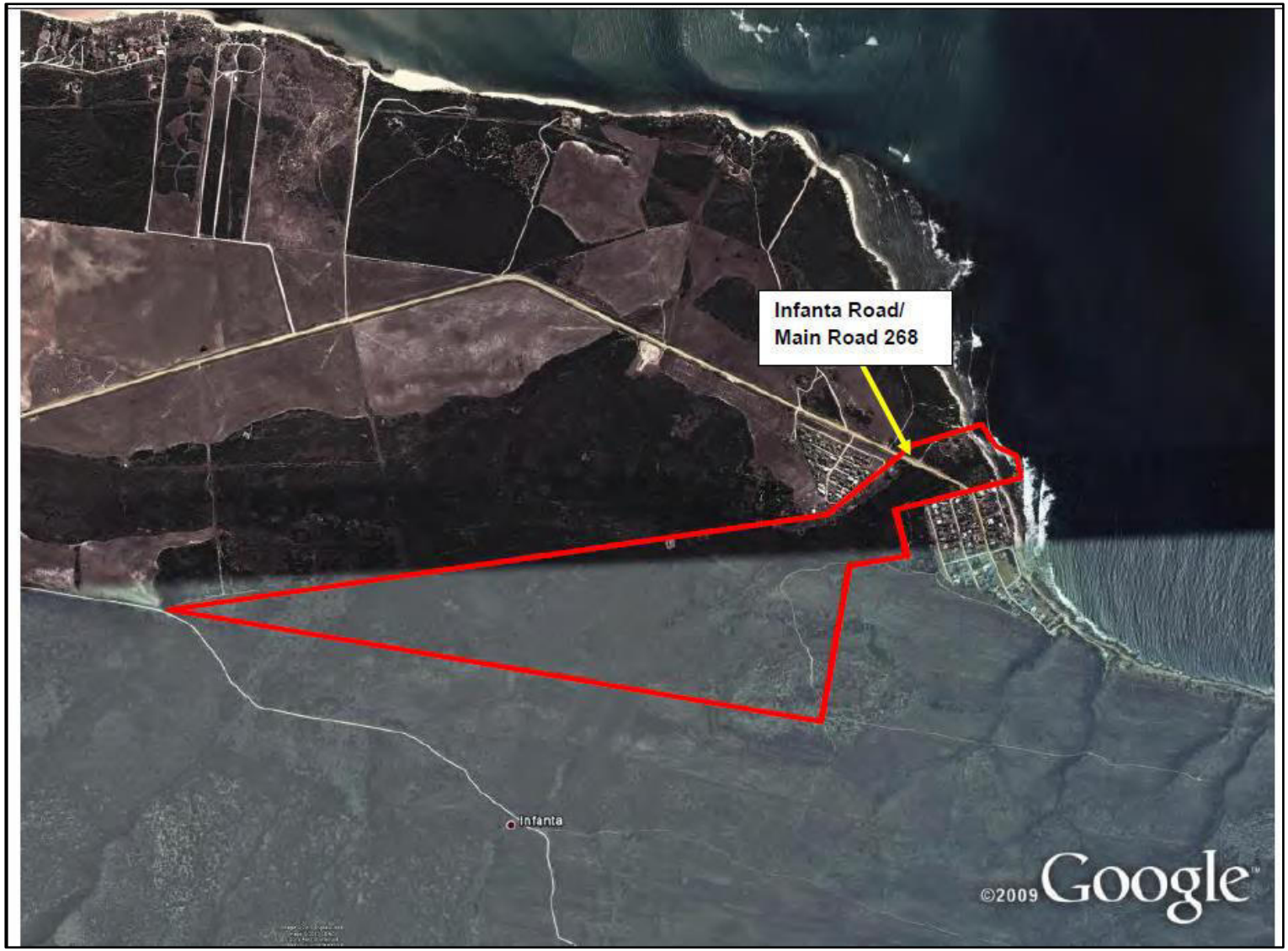
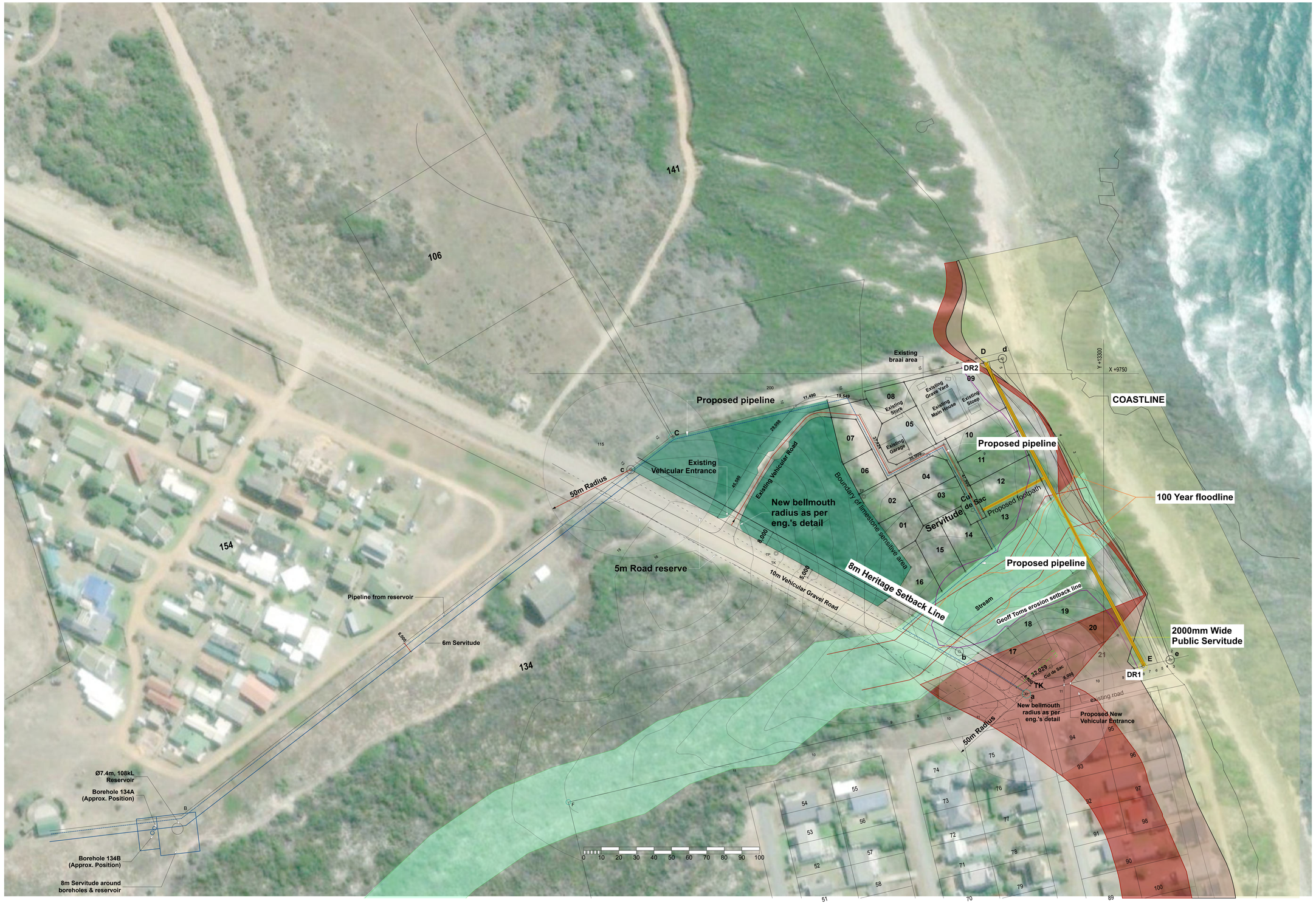


Figure 4: Erf 134

APPENDIX B – SITE DEVELOPMENT PLAN WITH SENSITIVITIES



Boundary line
Proposed Pipeline
Existing Borehole & Pipeline

Limestone Fynbos Conservation area (no –go area)
40m Ecological corridor (no-go area)

Coastal Management Line
Coastal High Risk Zone
Coastal Medium Risk Zone
Coastal Low Risk Zone

N

GENERAL NOTES:

1. The design of the drawing is copyright and remains the property of IG Architects.
2. All work is to be carried out strictly in accordance with the National Building Regulations and Municipal Regulations.
3. Only figured dimensions to be used, do not scale.
4. The contractor and sub-contractors are to check all relevant details, levels and dimensions on site and in the contract documents prior to commencement of work on site or manufacture of any components. Any queries or discrepancies are to be reported timeously to Architects, in writing.
5. Setting out positions as per architects' drawings to be certified by a registered land surveyor prior to the commencement of any works .
6. Any materials, fittings, furnishings, etc. described under a tradename, catalogue number or reference are to be either exactly as described or are to be, in the Architects sole opinion, of equal quality and specification in all respects, as those described. The Architects' approval must be obtained in writing for departure from the original description before submission of tenders, or before manufacturing and/or building in.
7. All materials are to be laid, lapped, sealed, fixed, etc. in strict accordance with the manufacturer's instructions. All sealing, cements, glues, fasteners, etc. are to be those supplied or recommended by the manufacturers' of the particular material.
8. All jobbing before and after all other trades to be performed neatly and with care, leaving all perfect.
9. Clean and/or wash all floors and surfaces upon completion. Clean out all shavings, cuttings and other rubbish before handing over.
10. Service all doors and moving parts before handing over.
11. All dimensions and levels to be checked on site prior to commencenment of work. Any queries to be forwarded timeously to the architect.

SIGNATURE: DATE:

CLIENT:

ARCHITECT:

DESCRIPTION:	DATE:	REV:

TOWN PLANNER:
davesaunders planner CC
dave saunders BSoc Sci MCRP (uct)
cell : 083 289 2967 ; fax : 021 686 6482
e-mail : dave@davesaunders.co.za

JOB NO:

5005/RHA 055

PROJECT:

Cape Infanta
New Housing Development

Portion of Erf 134
Situated at Cape Infanta

DESCRIPTION

Proposed Sub-division layout

SCALES: 1:750

PURPOSE: **Information**

DRAWN:	CHECKED:
MS	IG

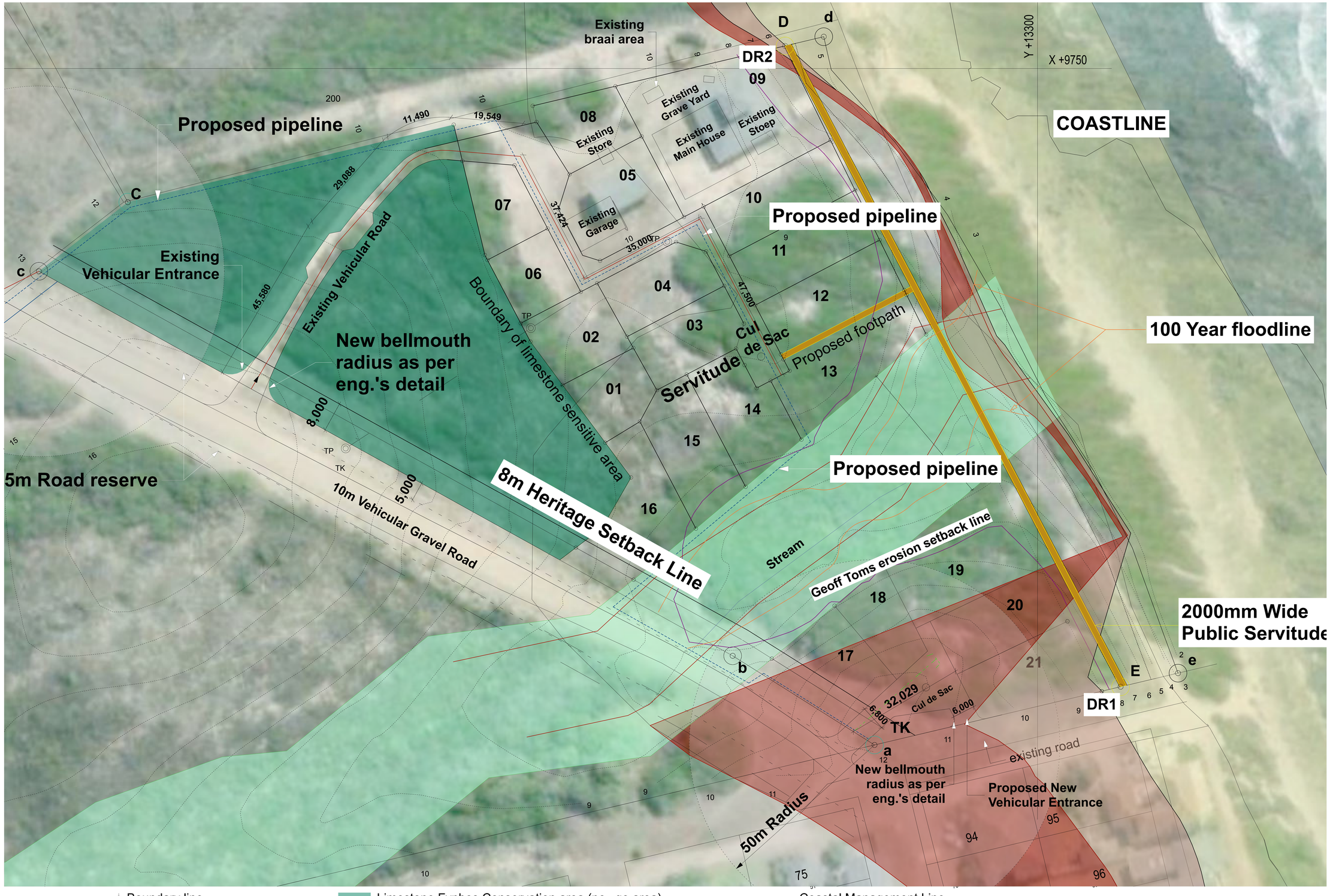
DATE CREATED:

DATE PLOT: 2023/05/19

ISSUED: 2023/05/19

DWG NO: **Diagram 29**

REVISION:



- Boundary line
- Proposed Pipeline
- Existing Borehole & Pipeline
- Limestone Fynbos Conservation area (no –go area)
- 40m Ecological corridor (no-go area)
- Coastal Management Line
- Coastal High Risk Zone
- Coastal Medium Risk Zone
- Coastal Low Risk Zone

N

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3. Only figured dimensions to be used, do not scale.
4. The contractor and sub-contractors are to check all relevant details, levels and dimensions on site and in the contract documents prior to commencement of work on site or manufacture of any components. Any queries or discrepancies are to be reported timeously to Architects, in writing.
5. Setting out positions as per architects' drawings to be certified by a registered land surveyor prior to the commencement of any works .
6. Any materials, fittings, furnishings, etc. described under a tradename, catalogue number or reference are to be either exactly as described or are to be, in the Architects sole opinion, of equal quality and specification in all respects, as those described. The Architects' approval must be obtained in writing for departure from the original description before submission of tenders, or before manufacturing and/or building in.
7. All materials are to be laid, lapped, sealed, fixed, etc. in strict accordance with the manufacturer's instructions. All sealing, cements, glues, fasteners, etc. are to be those supplied or recommended by the manufacturers' of the particular material.
8. All jobbing before and after all other trades to be performed neatly and with care, leaving all perfect.
9. Clean and/or wash all floors and surfaces upon completion. Clean out all shavings, cuttings and other rubbish before handing over.
10. Service all doors and moving parts before handing over.
11. All dimensions and levels to be checked on site prior to commencement of work. Any queries to be forwarded timeously to the architect.

SIGNATURE: DATE:

CLIENT:

ARCHITECT:

DESCRIPTION:	DATE:	REV:

TOWN PLANNER:
davesaunders planner CC
dave saunders BSoc Sci MCRP (uct)
cell : 083 289 2967 ; fax : 021 686 6482
e-mail : dave@davesaunders.co.za

JOB NO:

5005/RHA 055

PROJECT:

Cape Infanta
New Housing Development

Portion of Erf 134
Situated at Cape Infanta

DESCRIPTION

Proposed Sub-division layout

SCALES:

1:350

PURPOSE:

Information

DRAWN:	CHECKED:
MS	IG

DATE CREATED:

DATE PLOT: 2023/05/19

ISSUED: 2023/05/19

DWG NO:

Diagram 29

REVISION:

APPENDIX C – METHOD STATEMENT – EXAMPLE TEMPLATE

METHOD STATEMENT (MS)

Project title:			
Method Statement for:		**MS number:**	
Date drafted:		**Revision:**	
Description of actions required:	***WHAT*** *Brief description of the work to be undertaken*		
Frequency:	*How often required?*		
Commencement date:	***WHEN*** *Start date.*	**Expected date of completion:**	*End date.*
Location & description of work area:	***WHERE*** *Description/sketch/map of locality of work (where applicable)*		
Required materials & equipment:	***WITH WHAT*** *Detailed description of the materials & equipment to be used*		
Step-by-step plan of how the action(s) will be carried out:	***HOW*** *Detailed description of the process of work and methods*		
Storage/ disposal of materials and waste:	***HOW/WHERE*** *Detailed description of how materials and waste will be stored/ disposed.*		
Responsible party/ Contractor:	***WHO*** *is responsible for works?*		
Submitted to:		**Date of submission:**	

APPROVAL	**ECO**	**ER**	**CONTRACTOR**
Signature:			
Date:			

NB! Contractor to ensure Method Statements are submitted at least 7 business days prior to work commencing on site. It is the Contractors responsibility to submit the required MS timeously to the ER.

APPENDIX D – ENVIRONMENTAL AWARENESS MATERIAL

Environmental Management during Construction.

The why, what and how…

BUT WHY…

… should we care about the environment?

The environment provides us with everything we need to survive – food, water, fuel, air, etc. Human activity uses resources and has an impact on those resources. Managing our resource use and ensuring that our impact is minimised will ensure that these resources are not depleted.

The Constitution says that all people in South Africa have the right to a healthy environment. If you damage the environment, you are taking away that basic right of others as well as future generations – your children and grandchildren!

…environmental management if there is already conservation?

Historically, development and environmental conservation have been in conflict, because conservation was understood as the protection of resources, and development as the use, or exploitation of resources. The two competed for the same resources, but both are needed! Enter: *SUSTAINABLE DEVELOPMENT.*

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainable development thus aims to improve the quality of human life while living within our ecological means = the wise use of resources!

…environmental management of construction?

South Africa's effort to attain sustainable development is based on the concept of Integrated Environmental Management (IEM). The purpose of IEM is to resolve or lessen any negative environmental impacts and to enhance positive aspects of development.

IEM is designed to ensure that the environmental consequences of development proposals are understood and adequately considered in the planning, implementation and management of all developments.

It is intended to guide, rather than impede the development process by providing a method of gathering, analysing and utilising information about the environmental impacts of development. IEM and other principles of Environmental Management are set out in the National Environmental Management Act (No. 107 of 1998) & National Environmental Management Amendment Act (No. 62 of 2008)

BUT WHAT…

…exactly is the 'environment'? What if we're not working near rivers or fynbos or leopard toad habitat?

The environment is not only the 'conservation-worthy' such as rare plants and endangered animals. The environment is everything around you!

It is made up of living things (e.g. people, plants & animals) and non-living things (e.g. soil, water, buildings & cars). People and man-made things are also important parts of the environment.

Protection of the environment means that all living and non-living things are protected. During construction, Environmental Management Programmes (EMP's) are implemented not only to protect fynbos or leopard toads but also to protect people (both on site and off), property (houses, cars, etc.) as well as natural resources such as water, air and soil.

…do Environmental Management Programmes (EMP's) do? What does this mean for my contract?

EMPs are tools to facilitate environmental management during the construction phase of development projects and thereby avoid *unnecessary* impacts to the environment.

In the past, the functionality and efficiency of EMPs was hampered by resistance from contractors and engineers, the difficulties of costing for compliance and the lack of legal enforceability.

Now Environmental Management Programmes (EMP's) are stipulated in the Environmental Authorisations (ROD) as a condition of the approval to go ahead with the development, in other words it is *legally binding.*

When you sign a contract do work on a project with an EMP, you are legally bound to comply with that EMP!

Methods of implementing EMPs are becoming more and more stringent and issues of enforceability are being addressed. Those individuals and companies that are familiar with compliance with EMPs will be at a competitive advantage!

…do EMPs consist of?

EMPs usually contain an environmental policy statement, organisational structure detailing the responsibilities and authorities involved in the project, procedures for communication and record-keeping and environmental specifications.

EMPs are adapted to the scale and sensitivity of the construction project. They can be thick documents detailing specifications for every eventuality specifically adapted to the project, or they can be short and brief documents setting out standard environmental procedures and controls. Sometimes EMPs include extensive penalty and incentive schemes.

A WORD ON METHOD STATEMENTS:

A method statement can be requested or proposed when an activity is either not included in the EMP at all, if the EMP specifications for an activity is not deemed adequate, if an activity is required that is not allowed by the EMP, etc. In other words, when the EMP does no give enough information to manage the environmental impact of a specific activity.

A method statement is defined as a written submission by the Contractor setting out the plant, materials, labour and method proposed to carry out an activity. Method statements must provide enough detail that the environmental impact of the activity can be assessed. Method statements must therefore be submitted well in advance of the activity (usually at least 5 days but sometimes more).

Method statements are therefore an extension of the EMP, are also legally binding and are intended to ensure that the environmental implications of an activity outside of the EMP can be addressed.

Method statements usually require the approval by the engineer, the ECO/ESO/DEO, etc. before the activity can take place. If such an activity takes place without approval and result in environmental damage, the contractor is responsible for the cost of rehabilitation/clean-up/etc.

…is an ECO, ESO, DEO, etc.?

EMPs usually require the appointment of an ECO, ESO, DEO, etc. to oversee the implementation of and compliance with the EMP on behalf of the engineer or the contractor(s). Ultimate responsibility for compliance with the EMP lies with the contractor(s) and the engineer.

ESO = Environmental Site Officer – usually on site permanently or often. Can be independent consultant or from contractor/engineer.

ECO = Environmental Control Officer – usually visits site on a regular basis and audits compliance with the EMP. Usually independent consultant.

DEO = Designated Environmental Officer – usually on site permanently, usually member of contractor or engineer site staff.

Organisational structures and responsibilities differ from project to project and depend on environmental sensitivity of the project, scale of the project, etc. Increasingly nowadays, each party is required to appoint their own person responsible for environmental management on site, e.g. the engineer would have an ESO/ECO and the main contractor(s) would have an ESO/DEO etc.

It is therefore important to familiarise yourself with that part of the EMP that deals with organisation and responsibilities for each contract that you are involved in.

BUT HOW…

…do EMPs promote sustainable development?

They don't!

It is the people on site that protect the environment. The EMP, like any other plan or policy, is not worth anything if there isn't a commitment from those working on the project to compliance with the EMP.

…can I ensure my work comply with the EMP?

Environmental specifications in different EMPs can vary from vague to very detailed.

- Firstly, it is obviously important to know what those specifications are, vague or not, so READ THE DOCUMENT! Ignorance does not absolve you from your responsibility. A copy of the EMP must be kept at the site office at all times.
- It also helps to understand WHY those specifications are there – some things are obvious but others may not be. Some EMPs may have specifications that are not relevant. Don't be afraid to question the EMP; it can only increase its efficiency!
- Know where the sensitive areas on site are – watercourses, wetland areas, residential areas, etc. – and be extra vigilant when working in these areas.

Mostly environmental management of construction activities and compliance with EMPs require only common sense and with good housekeeping the battle is half won!

The enclosed environmental handout sets out the standard environmental specifications

DO'S AND DON'TS (1)

Workers & equipment must stay inside the site boundaries at all times.
Nobody may enter areas marked as No-go areas.

Why? Construction activities, equipment and people cause damage and disturbance to the area surrounding the site. As small an area as possible will be affected if all workers and equipment stay within the site boundaries. This is especially important if there are people who live around the site or natural areas around the site which should not be disturbed.

Do not swim in or drink from streams.
Do not throw oil, petrol, diesel, concrete or rubbish in streams.
Do not work in the stream without direct instruction.
Do not damage the banks or plants of streams.

Why? River water may be polluted which could make you sick.
Oil, petrol, diesel, concrete or rubbish will kill plants and animals living in the water. They may also make people who may drink the water downstream sick. Rubbish in the stream also makes it look ugly.
People and machinery working in the stream will damage it and kill plants and animals living in the stream. It may also cause erosion, which is expensive to repair.
The plants on the edge of the stream bind the soil together and prevent soil from getting washed away. Soil washed into a stream may affect people using the water downstream (e.g. for irrigation).

Protect animals on the site.
Ask your supervisor to remove animals found on site.

Why? Animals are an important part of the environment. All animals have a purpose, even snakes which catch mice and rats. Other important animals are owls, chameleons and frogs.

Do not damage or cut down any trees or plants without permission.
Do not pick flowers.

Why? Some plants are rare and may take a long time to grow back, if at all. Plants in the "no go" areas should not be damaged.
Some plants will die if their flowers are picked. Rare plants may be lost.

Put cigarette butts in a rubbish bin.
Do not smoke near gas, paints or petrol.
Do not light any fires without permission.
Know the positions of fire fighting equipment.
Report all fires.
Do not burn rubbish/ vegetation without permission.

Why? Leaving a burning cigarette butt on the ground may lead to runaway fires which are dangerous to construction workers, people living around the site, equipment, houses, plants and animals.
Smoking near flamable material is dangerous and may cause an explosion.
Lighting a fire without permission may cause a runaway fire (see above).
Reacting quickly to fires that break out will prevent them from spreading and causing damage.

DO'S AND DON'TS (2)

Work with petrol, oil & diesel only in designated areas.
Report any petrol, oil & diesel leaks or spills.
Use a drip tray under vehicles & machinery.
Empty drip trays after rain & throw away were instructed.

Why? Designated areas should have measures to protect against petrol, oil & diesel spills. Oil, petrol and diesel can drip onto the soil and soak into it. Plants will not grow and animals will not live in dirty soil. It also looks ugly to people living around the area.
Drip trays will prevent oil, petrol or diesel from soaking into the soil and killing plants and animals.
If drip trays are not emptied they may overflow and pollute the surrounding soil. If oil, petrol or diesel are put into a stream, plants and animals living in the stream will be killed. They may also make people who may drink the water downstream sick. Ask your supervisor where drip tray water may be disposed of on site.

Try to avoid producing dust – wet dry ground and stockpiles.

Why? Dust can be irritating to people and can reduce production on site. It can cause problems such as eye irritations and coughs. It also reduces visibility on and around the site, which can be dangerous to drivers and pedestrians, and can cause damage to the surrounding environment.
Soil should not be made too wet because that will cause safety problems and soil may be washed away.

Do not make loud noises around the site, especially near schools and homes.
Report or repair noisy vehicles.

Why? Loud noises are irritating to workers and people living around the site. Loud noise can also be harmful to people (especially children) and affect their hearing.
By keeping vehicles in good condition, loud noise can be prevented.

Use the toilets provided.
Report full or leaking toilets.

Why? Sewage attracts flies and other irritating pests. If the site is near a river or stream, sewage makes the water smell and people who swim in it or use it to wash their clothes will get sick. It also causes plants to grow too much which blocks the river, which may cause flooding of houses and property.
Regular emptying of toilets is hygienic and will also prevent overflows.

Make sure that you eat where there is a rubbish bin nearby.
Never eat near a river or stream.
Put packaging & leftover food into rubbish bins.

Why? Eating areas generate a lot of rubbish and litter (e.g. bottles and packets) which will pollute the site and surrounding areas. Therefore, eating must be done near bins which are placed in the eating.

Rubbish in a stream looks ugly and can be harmful to people's health. It may also kill the plants and animals living in the stream. Rubbish and food left lying around will attract pests (such as rats) which are dangerous to people and cause a health hazard. Also, rubbish left lying around is ugly and unpleasant to look at.

Do not litter–put all rubbish (especially cement bags) into the bins provided.
Ask your supervisor for a bin if there is none. Bins must be provided.
Report full bins to your supervisor.
The responsible person should empty bins regularly.

Why? Litter is ugly. It is also dangerous and unhealthy to adults, children and animals walking around the area. Not putting the lid back on the bin will cause rubbish to be blown away.
Regularly emptying bins will prevent litter and rubbish flying around the site.

Always keep to the speed limit.
Drivers - check & report leaks.
Ensure loads are secure & do not spill.

Why? Speeding is dangerous to people who live in the area, especially children. Speed kills!
Faulty vehicles are dangerous to the driver, pedestrians and other motorists. Leaks can also pollute the ground and water and smoke from vehicles can cause health problems.
This is a potential danger to other motorists. Also, do not overload vehicles.

Know all the emergency phone numbers.

Why? Prompt reaction to an accident, fire or spill will reduce the risk of serious damage to the environment and to workers.

<u>If rules are broken:</u>
- Spot fines
- Removal from site.
- Construction may be stopped.

Why? Failure to adhere to the EMP may result in spot fines being issued to the company. It is then the Site Agent's responsibility to collect these fines from guilty individuals and he may even deduct fines off your wages.
The fines are meant to act as an incentive for workers to take the EMP seriously.
A person may be removed from site if they continually disregard the specifications in the EMP.
If the EMP is not adhered to, the local Environmental Authority may stop construction.

Report any breaks, floods, fires, leaks and injuries to your supervisor.

Ask questions!

Thank you for your attention.

APPENDIX E – TEMPORARY SHUTDOWN CHECKLIST

SITE TEMPORARY SHUTDOWN CHECKLIST

In the event of a temporary site closure for any period of inactivity longer than 7 business days the Contractor is to notify the ECO. The Contractor / DEO shall check the site, ensuring that the following items are addressed and provide a brief written report on compliance to the ER and a copy sent to the ECO. This must be returned prior to the shutdown period commencing. It is the contractor's responsibility to return the required documentation complete and on time.

	ITEM TO BE ADDRESSED	COMPLETE (Yes/No)	COMMENT
Fuels / flammables / hazardous materials store			
1	Fuel stores are as low in volume as practicable.		
2	There are no leaks (vehicles, contains, bunds etc.).		
3	Fuel & hazardous materials stores and outlets are locked.		
4	Bund areas are emptied fire extinguishers are serviced and accessible.		
5	Emergency and management contact numbers are available and displayed.		
6	There are no stores or containers within the 1:50 year flood line.		
Safety			
7	Site safety checks have been carried out in accordance with the Occupational Health and Safety Act No. 85 of 1993 prior to site closure.		
8	All trenches and manholes are secured.		

9	Security personal has been briefed and has the facilities to contact and be contacted by the relevant management and emergency personnel.		

10	Night hazards such as reflectors, lighting, traffic signage, etc have been checked and are in place where required.		
11	Scaffolds and other structures vulnerable to high winds are secured.		
Erosion			
12	Dust mitigation measures as noted in the CEMP such as straw, binding agents, covering of stockpiles or similar are in place. Sand and spoil stockpiles to be stabilised or covered with shade cloth. Please note only non-potable water from a legal source may be used for dust damping. Please list dust abatement implemented or to be implemented prior to site closure.		
13	Excavated slopes and stockpiles are at stable angles and able to accommodate normal expected flows.		
14	Sand and other easily erodible materials are at the lowest volume possible on site.		
Water and pollution management			
15	Toilets to be emptied and secured. Plumbed toilets are to have no water leakages.		
16	Refuse bins are to be emptied and secured.		
17	Cement and materials store is secured.		

18	Works areas and camp site areas are clean and tidy. Litter and waste have been collected and removed from site.		

19	Plant remaining on site to have as little remaining fuel as possible and are to be checked for leaks. Suitable drip trays are to be placed and secured under all remaining plant.		
20	All other drip trays already in use are to be checked and emptied.		
Key Personnel Contact Details for Emergencies & Complaints			
21	Please provide details for at least three people that will be available at all times throughout the shutdown period to address any complaints or deal with any emergency situations that may arise.		*Name:* *Contact No.* *Name* *Contact No.* *Name* *Contact No.*

I the undersigned confirm that I have read and understood this document and that all the information provided above is true and correct.

Main Contractor: _____ . Date: _____ .
Company Name

Contractors Authorised Representative: _____ . Signature: _____ .
Name Signature

APPENDIX F – CV OF EAP

CURRICULUM VITAE of AMANDA FRITZ-WHYTE

ENVIRONMENTAL SCIENTIST & GEOLOGIST

1. PERSONAL DETAILS

Born:	17th July 1974
Nationality:	South African
Drivers License:	Code EB
Languages:	Proficient in English and Afrikaans

2. KEY COMPETENCIES

After completing a BSc Honors degree in geology and two years of mining geology experience, I was nominated onto the AngloGold Ltd Young Highflyer Program. Whilst on the program I was exposed to environmental management and was provided the opportunity to develop myself in that field of interest. I now hold a Master of Science degree in Water Resource Management and more than 23 years of environmental management experience.

During my career to date, I have accumulated experience in the following key areas:

Competencies	**Key Experience**
1. Water Management	• MSc in Water Resource Management (distinctions in two subjects) • Environmental Coordinator: Water (AngloGold Ashanti) • Water Use License Applications, General Authorizations and Existing Lawful Use verifications and registrations • Compilation of water management strategies/ plans for both the KOSH & West Wits areas • Management of wastewater treatment plant at Toyota SA Manufacturing • Wastewater management and pollution prevention (industrial) • Inter-basin pumping schemes (flood prevention) in mining (KOSH & West Wits area). • Industrial pollution control (planning, design & implementation) • Water management plan for OR Tambo airport • WSI and brine disposal authorisations

	• Water Tribunal Appeals • Existing Lawful Use determinations and V&V for various landowners (Western Cape)
2. Environmental Monitoring Programs	• Groundwater monitoring program for Toyota SA • EMP's for Coastal Disaster Rehabilitation projects and various construction projects • Maintenance Management plans (dams in Western Cape)
3. Environmental Management Systems	• Assistant in implementation of electronic EMS at AngloGold Ashanti operations • Implementation & Management of EMS for various plants at Toyota SA Manufacturing (Durban)
4. Environmental Assessments	• Risk Assessments conducted for large scale capital projects at AngloGold Ashanti • Basic Assessments for Coastal Disaster Rehabilitation projects (KZN) and construction projects (Western Cape and KZN) including Public Participation per project • S21(c) and (i) risk matrix assessments for determining impacts under the NWA • EIA for Mining Right expansion (Steyn's Quarry, Botrivier) • Risk assessment as part of Water Use License applications (Shoprite, PEPKOR, Caledon Mixed use development, Ackermans, Transnet)
5. Environmental Auditing	• Lead Auditor Toyota SA • NEMA compliance audits for mining • ECO for various construction projects • Water Use License audits (Shoprite Checkers (Pty) Ltd, Elgin Free Range Chickens & PEPKOR)
6. Geology	• BSc Honors degree (Geology, Biochemistry) • Two years underground mining geology experience • 4 years diamond evaluation and certification experience
7. Energy & Emissions	• Compilation of CO_2 inventory for Toyota SA

8. Capital Project Management	• Wastewater plant upgrade for Toyota SA
9. Training	• Training to middle management at Toyota SA Manufacturing on HSE course • Mentorship to Archaeology student Anja Huisamen (2017-2018) • Guest lecturer on Water Management Course (hosted by DWS) • Mentorship Candidate EAP

3. TERTIARY EDUCATION

3.1 Master of Science in Water Resource Management

Year/s of study: 2005 - 2006

Institution: University of Pretoria

Course Modules: Strategic Environmental Management
Water, Sanitation and Treatment
Water Quality Management
Water Conservation & Demand Management
Environmental Analysis, Assessment & Modeling
Environmental Paradigms
Environmental Governance

Thesis: ***Towards finding a solution to the KOSH inter-mine water management problems.*** (Refer to Section 4.5 for details).

3.2 Bachelor of Science Honours in Geology

Year/s of study: 1997 - 1998

Institution: University of Port Elizabeth

Subjects: Igneous petrology, Sedimentology, Structural Geology, Oceanography

Thesis: Structural geology formations on a farm near Steytlerville (Cape Fold Belt)

3.3 Bachelor of Science

Year/s of study: 1993 - 1996

Institution: University of Port Elizabeth

Major subjects: Geology, Biochemistry

Other subjects: Mathematics 1, Botany 1 & 2, Chemistry 1 & 2, Physics 1

4. EMPLOYMENT RECORD

4.1 Current

Designation: Environmental Assessment Practitioner

Period: May 2016 to current

Key responsibilities: Conduct EIA's, Basic Assessments, Setback Line applications, Water Use Authorizations, General Authorizations, S24G applications, Water Services Intermediary and Brine disposal authorizations, Mining Permit and License applications, S102 applications (including public participation requirements for all the listed processes as needed according to stipulations in NEMA). NEMA compliance audits, water audits, ECO work, social and labour plan compilations. S21(c) and (i) risk matrix assessments for determining impacts under the NWA, environmental awareness plans, EMP's, Alien invasive management plans, mining plans and Maintenance Management Plans. Public Participation is conducted as part of BAR, EIA and WULA processes. ELU and V&V determinations, Water Tribunal appeals.

4.2 Freelance/ Self-employed

Designation: Geologist/ Environmental consultant

Period: July 2011 to April 2016

Key responsibilities: Conducted all environmental work (comment on EMP's, comment on new legislation, submission to NWRMS parliamentary sub-committee, submissions to legal advisors and other NGO's) for TKAG.

Lobby Minister Anton Bredell for the establishment of the CoCT sludge to land application monitoring committee for Melkbosstrand / Philidelphia area.

Oversee BAR for Melkbosstrand High School Sports Fields and completed ECO work.

Geological work: Gemological work (evaluation and certification) of diamonds for clients. Registration process

for Diamond Regulator and Mining Right Conversion from Old Order Mining Right.

Prospecting work on site for diamond bearing gravels.

Reason for leaving: Moved back into full time formal employment sector

4.3 Enspire Environmental

Designation: Director

Period: June 2010 to July 2011

Key responsibilities: Manage all aspects of business for the KZN South Coast region: BAR's; EIA's; WULA's; S30 applications; S24G applications; waste management; auditing; ECO work, water management, preparation and submission of tender documents for large local government projects. Public Participation is conducted as part of BAR, EIA and WULA processes.

Reason for leaving: Relocated from KZN to Cape Town and resigned as Director of company

4.4 SSI Environmental

Designation: Associate

Period: March 2008 to May 2010

Key responsibilities: Develop client relations and deliver service to clients on the Kwa-Zulu Natal South Coast in the following areas:

BAR's; EIA's; WULA's; S30 applications; S24G applications; waste management; auditing; ECO work, water management, preparation and submission of tender documents for large local government projects in KZN and Nelson Mandela Metro. Green city competition coordinator on behalf of NMM.

Office manager: Business development, management of staff, budget reporting.

Compilation of water management plan and strategy for OR Tambo Airport.

Public Participation is conducted as part of BAR, EIA and WULA processes.

Reason for leaving: Had to downscale on amount of travelling due to the birth of my son.

4.5 Toyota South Africa Manufacturing (Durban)

Designation: Environmental Manager

Period: January 2006 to February 2008

Key responsibilities: Implement, maintain and audit EMS for various plants making up the Toyota SA manufacturing operations. Responsible for water management on site – effluent treatment plants, resource measurement, recycling opportunities and reduction in usage.

Implementation of anti-pollution measures on site (moving pipelines overhead, interception trenches and containment pits).

Reporting environmental performance to top management.

Budget compilation and tracking.

HSE advisor to new Warehouse Project. CMA representation on behalf of TSAM.

Reason for leaving: Head hunted by consulting firm

4.1 **AngloGold Ashanti: Environmental Management Department**

Designation: Environmental Coordinator: Water

Period: November 2001 to December 2005

Throughout this period, I was involved in the following key projects:

Project / Technical Area	**Personal Involvement**
Water management strategy addressing mine dewatering in the KOSH area This project involved developing a water management strategy to address the risk of deep-level gold mines in the Klerksdorp, Orkney, Stilfontein, Hartebeesfontein (KOSH) area flooding should neighbouring mines cease dewatering operations	• Compiled and interpreted historical data relating to fissure water quality, volumes and water balances; • Interpreted the 3D geological mining model for inter-basin water transfer; • Developed flow models; • Generated options for re-use of the fissure water; • Compiled a regional water management strategy for AGA mining area;

	• Facilitated KOSH Inter-Mine Forum meetings; • Created awareness with DWAF and DME at national and regional levels in regards the strategy and obtained their process requirements.
Water management strategy to allow for closure of the West Wits area This project involved developing a water management strategy to allow for closure of deep-level gold mines in the West Wits Area.	• Investigated pillar stabilities, fissure water sources and water balances; • Identified major environmental liabilities for AngloGold Ashanti and for the area; • Compiled a water management strategy linked to closure plans and the re-watering of underground compartments.
Water Management	• Conducted a financial evaluation on the proposed Waste Discharge Charge System (WDCS) and the local council takeover as water services provider; • Facilitated the compilation of catchment models for the Vaal River Area; • Managed the compilation of clean/dirty water assessments on all 25 AngloGold Ashanti SA business units; • Managed the compilation of a groundwater liability report covering AngloGold Ashanti SA Region; • Participated in workshops for Integrated Water Management policy for the Mining Sector on behalf of AGA; • Contributed to water management assessments for closure of Savuka Mine and Domain 3 area. • Represented the company at various fora, including Randwater; FWRDWA Licensing Sub-Committee, Kromdraai Licensing Forum; KOSH Inter-Mine Forum and WISA Mine Water Division. • Compiled water discharge licence application for West Wits Area; • Coordinated studies and funding agreement for Yellowfish genetic research projects; • Compiled the “Water management’ section of the Global reporting Initiative for AngloGold Ashanti

	SA; • Compiled environmental performance assessment reports for WUDL boreholes and extent of compliance reports for three business units.
Environmental Impacts Assessments (EIAs) EIAs were compiled for these two projects in the Vaal River Area: • Reworking of Rock Dumps (R150M) • Re-commissioning of West Pay Dam Tailings Storage Facility (R20M)	• Compiling background information for the EIAs; • Coordinating consultation meetings with key government departments; • Internal review of the draft EIA reports; • Ensuring project deadlines and budgets were met.
Emergency Preparedness Planning	• Assisted with emergency preparedness planning for tailings storage facilities in the West Wits Area.

Reason for leaving: To expand my career experience beyond the mining sector

4.2 **AngloGold Limited: Corporate Office**

Designation: Executive Assistant to Executive Officer SA Region
(Appointed on AngloGold Ashanti's Highflyer Program)

Period: August 2000 – October 2001

Key responsibilities: I was responsible for the following:

- Sourcing and compiling required information for the Executive of SA Region
- Coordinating and recording SA Exco, Management and Strategic Meetings for Executive
- Compiling the weekly Gold and Safety Report
- Compiling the Business Plan: 2002 for SA Region operations.

Reason for leaving: Completed the Highflyer Program

4.3 **AngloGold Limited: Tau Lekoa Mine**

Designation: Geologist (Manager in Training)

Period: June 1999 – August 2000

Key responsibilities: I was responsible for the following:

- Assisting the Senior Geologist with structural mapping underground, interpretation and providing an advisory service to the Mining Department.
- Managing own section in regards scheduling of work which included mapping, interpretation and advice;
- Logging of drilling core and interpretation thereof.

Reason for leaving: Selected for Highflyer Program (see above)

4.4 **AngloGold Limited: Great Noligwa Mine**

Designation: Geologist (Manager in Training)

Period: May 1998 – June 1999

Key responsibilities: I was responsible for the following:

- Assisting the Senior Geologist with structural mapping underground, interpretation and providing an advisory service to the Mining Department.
- Logging of drilling core and interpretation thereof.

Reason for leaving: Career development opportunity within the company.

5. COURSE / CONFERENCE PARTICIPATION

5.1 **Short courses completed**

Technical skills

- Waste management for Environmental Managers (PUCHO, 2002)
- Water Quality Management (Technikon Pretoria, 2002)
- Water Quality Management for Environmental Managers (PUCHO, 2002)
- Water Quality Monitoring (PUCHO, 2003)
- Introduction to GIS (PUCHO, 2001)
- MS Word, Excel, Access, PowerPoint, Projects, ArcGIS, ArcView, ArcInfo
- Air Quality Modeling (PU, 2007)
- Pump Course (SAIME, 2007)
- Windeed (2008)
- Internal Project Management SSI (Modules: General business principles; General contract principles; Risk Awareness; OHS; Service Quality) (2008)
- Biodiversity Offset training workshop (SANBI, 2018)
- Water Governance (2019)

Environmental processes

- Environmental Risk Assessment (PUCHO, 2001)
- Environmental Impact Assessment (PUCHO, 2001)
- Environmental Law (PUCHO, 2001)
- Environmental Auditing (PUCHO, 2001)
- Issue-based Risk Assessment (ATDS Learning Centre, 2000)
- New EIA Regulations (2006)

Project-management and leadership

- Business Presentation Skills (Maccauvlei Training Centre, 1999)
- Industrial Relations (Maccauvlei Training Centre, 2000)
- Finance for Non-Financial Managers (Maccauvlei Training Centre, 1999)
- Leadership for Middle Managers (Maccauvlei Training Centre, 1999)
- Middle Management (Maccauvlei Training Centre, 1999)
- Emotional Intelligence Course (AngloGold Ashanti, 2004)

Geological

- Diamond Drilling Techniques (ATDS Learning Centre, 1999)
- Rough Diamond Evaluation Course (Harry Oppenheimer Training School, 2011)

6. LIST OF PROJECTS TO DATE

Project Name	Year	Role of EAP
Proposed Riverbank Stabilization Measures to Address Flood Damage at Riverside Park, Umzinto	2009	Review of BAR, EMP, PPP for all aspects of application
KZ 212 MAL 16: Basic Assessment for the Umdoni Storm Damage remediation in Malangeni, Umdoni Local Municipality.	2009	Review of BAR, EMP, PPP for all aspects of application
KZ212Mal17&18: Malangeni Road reconstruction, stormwater controls and gabion protection at stream crossings.	2009	Review of BAR, EMP, PPP for all aspects of application
KZ 212 PR6: Storm damage repairs and upgrades at Park Rynie, Umdoni Municipality	2009	Review of BAR, EMP, PPP for all aspects of application
KZ 212 UMZ 11 and 9: Consolidated Basic Assessment for the Umdoni Storm Damage remediation in Umzinto Main Road & Alexandra Crescent, Umdoni Local Municipality.	2009	Review of BAR, EMP, PPP for all aspects of application
KZ 212PR1& KZ212PR13: Consolidated Basic	2009	Review of BAR, EMP, PPP for all aspects of application

Assessment for Stormwater control and damage repairs in Park Rynie Beachfront Parking and Lotus Park		
Basic Assessment for the 2008 Flood Disaster Project, KZ212 UMZ6 (Esperanza)	2010	Review of BAR, EMP, PPP for all aspects of application
Tidal Surge Rehabilitation work for Northern and Southern Beaches (Hibberdene Main Beach, Umzumbe Main Beach, Pumula, Banana Beach, Sunwich Port Main Beach, South Port Main beach, Umtentweni, Silver Beach, Shelley Beach, Peter Pan Beach, Glenmore and Munster, Palm Beach, Southbroom)	2008	Compilation of application, PPP, all aspects of applications
Hibiscus Coast Tidal Surge port Shepstone: Elizabeth drive Rehabilitation project	2008	Compilation of application, PPP, all aspects of applications
Tidal Surge Rehabilitation of Central Beaches located at St Michael's on Sea, Uvongo, Manaba, Margate and Ramsgate	2008	Compilation of application, PPP, all aspects of applications
Proposed residential Grieg house in Kelso	2008	Compilation of application, PPP, all aspects of application
Basic assessment for the re-development of Marlicht Holiday Resort in Margate,	2010	Compilation of application, PPP, all aspects of application

KwaZulu Natal		
Mbango Sewer Line	2008	Compilation of application, PPP, all aspects of application
Proposed Rehabilitation of Rural Roads within Hibiscus Coast Local Municipality.	2010	Review of BAR, EMP, PPP for all aspects of applications
Ugu District Municipality – Scottburgh Sewage Works Tidal Surge Repairs	2008	Review of BAR, EMP, PPP for all aspects of application
Proposed Removal of Tidal Pool in Southbroom, Hibiscus Coast Local Municipality	2010	Review of BAR, EMP, PPP for all aspects of application
Umdoni Beach Rehabilitation – Phase 2	2008	Compilation of application, PPP, all aspects of application
Agulhas Erf 854 Setback Line Application	2016	Compilation of application, PPP, all aspects of application
Basic Assessment P90 of Farm 587, Hemel en Aarde	2016-2017	Compilation of application, collation of specialist input, PPP, EMPs, all aspects of application
S102 amendment (Scoping and EIA) Steyns Quarry, Botrivier	2016-2019	Verification of S102 process with DMR; Compilation of scoping and EIA reports, collation of all specialist input, PPP, all aspects of application process (both NEMA and MPRDA processes)
Basic Assessment for On The Earth Tented Camp, Elgin	2018	Compilation of application, PPP, EMPs, all aspects of application

Basic Assessment P1 of Farm 627 Phillipskop, Stanford	2016-2017	Compilation of application, collation of specialist input, PPP, EMPs, all aspects of application
Basic Assessment P58 of Farm 406, Slanghoek	2016-2017	Compilation of application, collation of specialist input, PPP, EMPs, all aspects of application
Basic Assessment P18 of Farm 238, Stormsvlei	2018-2019	Compilation of application, collation of specialist input, PPP, EMPs, all aspects of application
Keurboomen Mine Permit application RE of P6 of Farm 191, Swellendam (Basic Assessment)	2016-2017	Compilation of application, collation of specialist input, PPP, EMPs, all aspects of application (both NEMA and MPRDA processes)
S24G authorization for Avontuur Chicken Farm, Stormsvlei	2018 to 2021	Compilation of S24G application, collation of specialist input, PPP, EMPs, all aspects of application and administration fine.
WULA/ GA/ ELU for: a) Cilmor distribution centre Shoprite b) Shoprite Constantia centre c) Shoprite GB Mall d) Shoprite Vergelegen Mall e) Shoprite Delft Mall f) Shoprite Boschenmeer Mall g) George quarry h) Botrivier sandmine	2016 to 2021	Compilation of all information for DWS; project management of specialists; justification of ELU using historical photography and water use rights; Public Participation for WULA

i) Lomond Wine Estate j) Plattekloof Farm Riversdale k) De Berg Farm Riversdale l) Groote Fontein Farm, Stilbaai m) Brown dog Farm, Franskraal n) Ocean Mushrooms Botrivier o) Elgin Free Range Farm Karwyderskraal p) Shoprite Noordhoek q) Slanghoek Mountain Resort r) PEPKOR main site Parow s) PEPKOR DC Cape Town		
WSI and Brine authorizations for Shoprite GB Mall and Constantia Mall	2018 to 2021	All aspects of project- compilation of WSI and brine disposal applications.
Water Tribunal appeals for two Shoprite sites (GB Mall and & Delft Mall)	2019 – 2021	Representing client during hearings and compilation and submission of appeal documentation.
GA for Curro Delft site	2020- 2021	Compilation and submission of all documentation to DWS.
Basic Assessment for dam expansion Dasbosch farm, Porterville	2019 to 2021	Compilation of application, collation of specialist input, PPP, EMPs, all aspects of application

Basic Assessment for dam expansion Montdry, Barrydale	2019 to 2021	Compilation of application, collation of specialist input, PPP, EMPs, all aspects of application
Setback Line Application Erf 954, L'Agulhas	2022	Compilation of application, PPP and impact assessment
Riverstone Farm Franschoek Water Due Diligence	2022	Assessment of existing lawful uses and development of water management and authorization strategy
Diepgat Farm Hemel-en Aarde Valley Water Due Diligence	2022	Assessment of existing lawful uses and development of water management and authorization strategy
Caledon Mixed use Development WULA	2022	Compilation of technical report, application process on e-wulaa
Keurboomen Mine Closure Plan	2022	Compilation of closure plan associated with identified risks and PPP – management of all aspects of closure process
Registration of General Authorizations for Baleia Wines	2022	Registration of 3 General Authorizations for various water uses on site – management of registration process on e-wulaa
Delft Mall WULA audit	2023	Audit of site against Water Use Licence and submission of findings and recommendations to DWS
GB Mall WULA audit	2023	Audit of site against Water Use Licence and submission of findings and recommendations to DWS
Riverstone ELU verification	2023	Verification and Validation of ELU water uses on site and submission to DWS
Greenacres Shoprite WULA	2023	Compilation of technical report, PPP, application process on e-wulaa
Cape Winelands Airport	2022 - 2024	Environmental Impact Assessment for

		Cape Winelands Airport project (includes compilation of application, collation of specialist input, PPP, WULA, MMP)
Water Tribunal Appeals for Dasbosch and Driebos Farms, Porterville	2023-2024	Representing client during hearings and compilation and submission of appeal documentation.
Rooiels Basic Assessment	2023-2024	Compilation of application, collation of specialist input, PPP, EMPr, all aspects of application
Ackermans DC WULA	2024	Compilation of technical report, PPP, application process on e-wulaa
Belcon Transnet WULA	2024	Compilation of technical report, PPP, application process on e-wulaa
Erin de Vigne WULA	2024	Compilation of technical report, PPP, application process on e-wulaa
De Draay WULA	2024	Compilation of technical report, PPP, application process on e-wulaa
Melkhoutrivier WULA	2024	Compilation of technical report, PPP, application process on e-wulaa

NOTE: PPP in text refers to Public Participation Process (inclusive of stakeholder meetings, advertising, compilation of IAP register and Comments and Response)

7. AFFILIATIONS AND MEMBERSHIPS:

Fellow Member WISA (Lead Climate Change Sector)
Member IAIAsa
Registered Environmental Assessment Practitioner: Number 2019/367 (EAPASA)
SACNASP Registration - Pri.Sci.Nat (118385)

APPENDIX G – ENVIRONMENTAL AUTHORIZATIONS

To be appended once obtained

APPENDIX H – HOUSE CONSTRUCTION CEMP

PROPOSED CAPE INFANTA RESIDENTIAL DEVELOPMENT ON A PORTION OF ERF 134, INFANTA

APPENDIX H: INDIVIDUAL HOUSE CEMP (draft for comment)

Prepared by: PHS Consulting

DEA&DP Reference: 16/3/3/6/7/1/E3/6/1456/25 (Pre-application Phase)

TABLE OF CONTENTS

1. BACKGROUND AND OBJECTIVE

The purpose of this Construction Environmental Management Plan (CEMP) document is to set the terms and conditions with which the Builder and Owner(s) must comply, to minimise any negative impact on the environment.

A number of documents associated with this development provide conditions to ensure that the design, construction and (later) renovation of houses on the property takes place in an orderly fashion with the constraints set to enhance the protection of the environment and the aesthetic character of the development. These documents include the Agreement of Sale and well as the CEMP.

2. RESPONSIBILITY

2.1. HOMEOWNERS ASSOCIATION

The Homeowner's Association (HOA) shall monitor and enforce compliance with this CEMP. Owners will be required to enter into contracts with the HOA and with the Builder to ensure that the terms and conditions of the CEMP are complied with and to ensure that the environment is protected for the duration of the works.

2.2. ENVIRONMENTAL SITE OFFICER

An Environmental Site Officer ("ESO") must be appointed by the HOA/Owner to monitor and control compliance with the CEMP for the duration of the house construction works. Work will not be allowed on an erf without the formal appointment of an ESO. The ESO will be responsible for undertaking the following tasks for the duration of house construction work on an erf:

- To visit the erf directly prior to the commencement of the house construction works to inspect and approve the Builder's erf drawing which indicates the position of storage shed(s), position of topsoil and excavated soil storage areas, the position of building material storage areas and the position of deliveries to the erf and position of toiled/ablution facilities.
- To hold a CEMP education session aimed at educating and raising the awareness of the Builder and their personnel and subcontractors as to the sensitivity of the Property prior to commencement of the house construction works, and to target responsible individuals as key players for environmental education, to facilitate the spread of the correct environmental attitude for the duration of the works.
- To review all elements of the works with the Builder to determine which elements require method statements, to instruct the Builder to submit these method statements and to approve such methods.
- The ESO is to visit the erf every second week for a period of at least one hour for the duration of the house construction works in order to undertake the following tasks:
    i. To review method statements and determine the most environmentally sensitive options of modus operandi for the construction related tasks, when considered necessary by the ESO.
    ii. To make on-site decisions regarding any vegetation removal or retention.
    iii. To take immediate action on site where clearly defined no-go areas are violated, or in danger of being violated, and to inform the Owner and HOA immediately of the occurrence and the action taken.
    iv. To keep a site diary of any incidents of environmental disturbance or damage, instructions or recommendations to builders and owners, and penalties recommended to the HOA.
    v. The ESO shall advise (but not instruct) the Builder on environmental matters relating to, or arising in the course of, the execution of the works on an erf.

vi. Where possible, it is advisable to use the same ESO for as many sites as possible.
vii. The ESO is empowered to order the Builder to immediately cease any element of the works which contravene the conditions of the CEMP, and/or which are required to be stopped as a matter of urgency in order to prevent serious adverse environmental damage or potential environmental damage to any of the adjacent properties or areas outside the boundaries of the erf, provided that the ESO shall without delay report on such action to the Local Authority, the HOA and the Owner.
viii. The ESO shall simultaneously refer to the HOA, the Owner and to the Local Authority any impending, apparent or alleged failure by the Builder to carry out their obligations in terms of the CEMP or to heed advice or any order given by the ESO in terms of paragraphs this clause.
ix. Instructions to the Builder will be issued only by the Owner through their system established for the project management and control of the house construction operations.
x. Any amendment or variation of the advice given by the ESO, which is proposed by the Owner when instructing the Builder, must be reported with full motivation by the Owner, to the Local Authority who approved to CEMP, and the HOA.
xi. The Owner and/or Builder will consult with the ESO with respect to any aspects of the house construction operations, which may impact on the environment.
xii. To visit the erf at the completion of house construction, ensure that all trees and other vegetation in the private open space areas on the property have not been damaged or removed, and ensure that the erf and surrounding areas have been suitably cleaned.
xiii. The ESO shall liaise with the ECO, the Owner and the HOA on a regular basis.

Refer to Figure 1 for flow diagram illustrating roles and responsibilities.

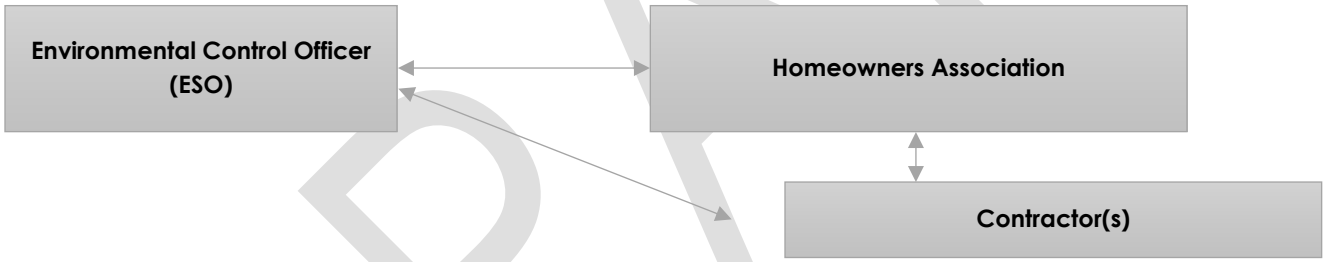

Figure 1: Flow diagram illustrating roles and responsibilities.

3. MANAGEMENT ACTIONS

3.1. QUALIFICATION OF BUILDERS

Builders must be suitably qualified and approved by the Developer or HOA. Builders are at all times responsible for their sub-contractors, employees and suppliers while on the Property.

3.2. TERMS AND CONDITIONS FOR HOUSE CONSTRUCTION

When a builder is found to be in breach of the stated rules and regulations a penalty will be levied. The extent of the penalty is detailed below the description of each condition. Where a penalty is insufficient to cover the cost of repairing the environmental damage caused by the breach, the HOA reserves the right to recover the additional costs from the Owner.

3.3. ERF DRAWINGS AND BUILDING PLAN CONTROLS

The ESO must approve the Builder's erf drawing which indicates the position of storage shed(s), position of topsoil and excavated soil storage areas, the position of building material storage areas and the position of deliveries to the erf. The Builder must ensure that the signed approved building plan is available at all times for inspection by the HOA. Any variations to the approved building plan must be submitted to HOA for signed approval and may only be implemented once the approved variation is available to the Builder.

Prior to commencing with the house construction works the Builder must –

(i) set out the foundations for inspection and approval by the HOA;
(ii) confirm the height of buildings with the HOA;
(iii) set out and confirm the form of driveway with the HOA;
(iv) provide a site drawing indicating –
    a. the position of storage shed(s);
    b. position of topsoil and excavated soil storage areas;
    c. the position of building material storage areas; and
    d. the position of deliveries
    e. and toilet/ablution facilities.

The Builder must make application to HOA for the issuing of a Plinth Certificate, to ensure that the correct overall height of the building is maintained. This certificate must be issued prior to the commencement of the construction of the superstructure. The Builder will be denied access to the Property until the above documentation is in place. The Builder will be instructed by the HOA to remove any structures that do not conform to approve plans.

3.4. ENVIRONMENTAL EDUCATION

The ESO shall hold an education session, as and when required, for all employees and subcontractors of the Builder on the terms and conditions of this CEMP. All staff and subcontractors must attend this education session prior to working on the Property. Personnel who have not attended an education session will not be allowed onto the Property.

3.5. METHOD STATEMENTS

The ESO may require method statements from the builder in which the methodology for undertaking certain elements of the works is described, and such method statements must be submitted to the ESO's approval prior to commencement of any house construction works on the erf. Work by the Builder will be stopped by the ESO until a method statement or statements have been submitted to the ESO for approval.

3.6. LIMITS OF BUILDING ACTIVITY

All activities relating to the house construction must be confined to within the erf boundaries where the works are executed. It is the responsibility of the Builder to ensure that his personnel remain within the demarcated areas of the erf on which they are working. If there are transgressions, the HOA and/or ESO will stop work by the Builder until such time as the Builder's equipment/staff has been moved to within the boundaries of the erf. The Builder will be fined R250.00 per transgression.

3.7. SITE PRESENTATION AND SPOILING OF EXCESS MATERIAL

The Builder shall keep the appearance of the erf neat and tidy at all times to the satisfaction of the ESO and the HOA. Building rubble must be removed from the erf at intervals not exceeding one week, and litter must be removed from

the erf on a daily basis, to an approved waste disposal site. No litter may be stored or mixed in amongst building rubble. Refuse drums must be supplied for the purpose of storing refuse until removed from the erf by the Builder. No material or building rubble shall be spoiled on the site.

Should a builder fail to remove building rubble or litter within the specified timeframe after receiving written notice to this effect, the rubble will be removed by an outside contractor. The costs of this outside contractor shall be paid by the HOA and reclaimed from the builder. The Builder will be denied access to the Property until such costs have been paid in full. In addition to this the Builder will be fined R1 000.00 per offence.

Should windblown litter be generated from the erf, the Builder will be fined R 250.00 per day until all refuse has been removed from the stand and the surrounding area.

3.8. CLEANING OF VEHICLES/EQUIPMENT

The washing of Builder's vehicles and equipment is not permitted on the property. The Builder will be fined R500.00 per offence.

3.9. FIRES

No fires will be allowed on any part of the Property including the erf. The Builder is to provide at least two fully operational fire extinguishers, which must be on site at all times. The Builder will be fined R1 000.00 per offence of not having the firefighting equipment on site and in working order. The Builder will in addition be held legally and financially responsible for any damage caused by a fire resulting from builder negligence.

- Contractors must ensure that open fires on the site for cooking or heating are not allowed except in designated areas.
- Contractors must ensure that construction related activities that pose a potential fire risk, such as welding etc., are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include clearing working areas and avoiding working in high wind conditions when the risk of fires is greater. In this regard special care must be taken during the high risk dry, windy summer months.
- Contractors must provide adequate firefighting equipment on-site;
- Contractors must provide fire-fighting training to selected construction staff;
- In the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate property owners, including farmers, for any damage caused to their properties and losses incurred. The contractor should also compensate the firefighting costs borne by farmers and local authorities.

3.10. SMOKING

The builder shall ensure that his employees do not smoke on the Property except in a designated smoking area within a five-metre radius of a portable fire extinguisher. The Builder will be fined R150.00 per smoking incident by any member of his team.

3.11. ABLUTION FACILITIES

Builders must make adequate provision for potable water and temporary toilets located on the erf for the use of their employees.

3.12. PROTECTION OF SENSITIVE AREAS

There is a 40m corridor demarcated around the stream. This corridor is a no-go area. The stream corridor must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils, fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the Contractor's activities. In the event of a spill, prompt action must be taken to clear the polluted or affected areas. Appropriate rehabilitation and re-vegetation measures for the riverbanks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows.

3.13. SCREENING OF BUILDING SITES

The Builder shall screen off the erf with a 1.8 metre high black shade-netting screen in the following circumstances –

(i) where there is no screening wall between the site under construction and the adjacent property
(ii) at the discretion of the HOA.

The Builder will be denied access onto the Property until such screening structures are in place.

3.14. HOURS OF WORK

Construction activities should not be permitted over weekends, specifically long weekends (such as the Easter Weekend) and the December school holidays, specifically the period 14 December to 6 January. This is to reduce the impact on those people who live in Infanta permanently and or who visit the area over weekends and holiday times. Construction activities during weekdays should be confined to the following hours – 07h30 and 17h30. This is to reduce the impact on the permanent residents of Infanta or and people who visit the area during the week.

No employees will be allowed to remain on site during private time. In addition, the Builder will be fined R500.00 per transgression.

3.15. WASHING OF CONCRETE DELIVERY VEHICLES

The washing of premixed concrete delivery vehicles must not take place within the Estate. Under no circumstances may concrete be spilled onto the road surface and the Builder will be held responsible for the repair to the road if this occurs. The Builder will be fined R500.00 per offence in addition to the costs of repairing the road.

3.16. STORAGE SHEDS/HUTS

The Builder will be allowed to erect temporary storage sheds/huts within the boundaries of the erf, to a maximum height of 2.4 metre above ground level. The position of such structures must be indicated on the site diagram, which must be approved by ESO/HOA in terms of 3.3. The Builder will be instructed to remove any structures that do not conform to this regulation.

3.17. SPEED LIMIT

For security and safety reasons the speed limit on the Property for all vehicles is 35 km per hour. The Builder shall ensure that his employees, subcontractors, and delivery vehicles adhere to this rule. The Builder will be fined an amount of R500.00 per transgression.

Continuous non-compliance will result in the Builder being expelled from the Property.

3.18. GENERAL CONTROLS

One representative of each Builder is expected to attend a weekly site meeting to discuss general issues relating to work on the property. A representative of the HOA should attend at least every third weekly site meeting. The Builder will be fined an amount of R250.00 for not attending the site co-ordination meetings.

3.19. ROADS AND ROAD VERGES

Builders must ensure that the road in front of their erf is swept clean to the satisfaction of the ESO and HOA at all times. Builders must also ensure that the kerbs and sidewalks in front of their erf are adequately protected from damage by the house construction works. All building materials must be stored on the erf. Special permission may be obtained from HOA to neatly store some material on the road verge directly in front of the erf. The Builder will be fined R150.00 per day for roads not swept.

The Builder will be held financially and legally responsible for the damage to road surfaces and kerbs caused through his house construction works.

3.20. PAYMENT OF FINES

All monies owing to HOA must be paid on the Monday following the fine. The HOA will keep separate management and accounting records for these fines and ensure that monies from fines are used to repair environmental damage only. In the event of the Builder failing to pay a fine in time the Builder will be denied access onto the Property.

3.21. SITE CLEARING AFTER CONSTRUCTION

All building material, spoil, and equipment, including fencing and temporary toilets, are to be removed from site within two days of completion of building. The ESO is to check the site and sign a site clearance form, indicating that site clearance has been satisfactorily undertaken. Final payment of the Builder will only be made once this site clearance is signed.

3.22. PROTECTION OF HERITAGE RESOURCES

If any archaeological remains (including but not limited to fossil bones and fossil shells, coins, indigenous and/or colonial ceramics, any articles of value or antiquity, stone artefacts and bone remains, structures and other built features, rock art and rock engravings) are discovered during construction they must immediately be reported to HWC and must not be disturbed further until the necessary approval has been obtained from HWC.

Should any human remains/burial or archaeological material be disturbed, exposed or uncovered during construction, these should immediately be reported to the South African Heritage Resources Agency (021 462 4502) and Heritage Western Cape (021 483 9685). The ECO and ER are also to be informed. An archaeologist will be required to remove the remains at the expense of the developer.

The Contractor may not, without a permit issued by the relevant heritage resources authority, destroy damage, excavate, alter, deface or otherwise disturb archaeological material.