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DRAFT

PRE-CONSTRUCTION, CONSTRUCTION AND POST-CONSTRUCTION PHASE

ENVIRONMENTAL MANAGEMENT PROGRAMME

FOR THE

THE PROPOSED MIXED-USE RESIDENTIAL DEVELOPMENT ON PORTIONS 7 AND 8 OF THE FARM KRANSHOEK 432, BITOU LOCAL MUNICIPALITY, GARDEN ROUTE DISTRICT MUNICIPALITY, WESTERN CAPE.

APPLICANT:	KRANS DEVELOPMENT (PTY) LTD
ENVIRONMENTAL ASSESSMENT PRACTITIONER:	SHARPLES ENVIRONMENTAL SERVICES CC RESPONSIBLE EAP: MADELEINE KNOETZE (EAPASA REG: 2021/3230) OVERSEEING EAP: BETSY DITCHAM (EAPASA REG: 2020/1480)
DFFE PROJECT REFERENCE:	16/3/3/6/7/2/D1/13/0181/24
SES REFERENCE NUMBER:	CT9/Krans/DEMPR/03/26
DATE:	17 March 2026

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APPENDIX 4 OF THE EIA REGULATIONS 2014 (AS AMENDED 2017).

This Environmental Management Programme has been drafted in accordance with Appendix 4 of the Environmental Impact Assessment Regulations 2014 (as amended 2017). The table below shows how the requirements of Appendix 4 have been included within this Environmental Management Programme.

(1) An EMPr must comply with section 24N of the Act and include— (a)details of– (i)the EAP who prepared the EMPr; and (ii)the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Appendix A
(b)a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Appendix B - E
(c)a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Appendix C
(d)a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including— (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 - 10
(f)a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to — (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 practices; (iii)comply with any applicable provisions of the Act regarding closure, where applicable; and (iv)comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable;	
(g)the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	
(h)the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	
(i)an indication of the persons who will be responsible for the implementation of the impact management actions;	
(j)the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	
(k)the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 12 -13 Appendix H
(l)a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	
(m)an environmental awareness plan describing the manner in which— (i)the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii)risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 15 Appendix C
(n)any specific information that may be required by the competent authority.	

COMPLIANCE WITH SECTION 24N OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998, AS AMENDED (ACT 107 OF 1998)

(1) The Minister, the Minister of Minerals and Energy, an MEC or identified competent authority may require the submission of an environmental management programme before considering an application for an environmental authorisation.	This Environmental Management Programme (EMPr) has been compiled in accordance with the requirements of the Environmental Impact Assessment Regulations and is currently being circulated for public review purposes.
(1A) Where environmental impact assessment has been identified as the environmental instrument to be utilised in informing an application for environmental authorisation, or where such application relates to prospecting, mining, exploration, production and related activities on a prospecting, mining, exploration or production area, the Minister, the Minister of Minerals and Energy, an MEC or identified competent authority must require the submission of an environmental management programme before considering an application for an environmental authorisation.	
(2) The environmental management programme must contain-	
(a) information on any proposed management, mitigation, protection or remedial measures that will be undertaken to address the environmental impacts that have been identified in a report contemplated in subsection 24(1A), including environmental impacts or objectives in respect of- *(i) planning and design;* *(ii) pre-construction and construction activities;* *(iii) the operation or undertaking of the activity in question;* *(iv) the rehabilitation of the environment; and* *(v) closure, if applicable;*	Sections 8, 9, 0 and 11
(b) details of- *(i) the person who prepared the environmental management programme; and* *(ii) the expertise of that person to prepare an environmental management programme;*	Section 4
(c) a detailed description of the aspects of the activity that are covered by the environmental management programme;	Section 5
(d) information identifying the persons who will be responsible for the implementation of the measures contemplated in paragraph (a);	Section 12 Appendix E
(e) information in respect of the mechanisms proposed for monitoring compliance with the environmental management programme and for reporting on the compliance;	
(f) as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and	Sections 8, 9, 0 and 11
(g) a description of the manner in which it intends to- *(i) modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;* *(ii) remedy the cause of pollution or degradation and migration of pollutants; and* *(iii) comply with any prescribed environmental management standards or practices*	Sections 8, 9, 0 and 11
(3) The environmental management programme must, where appropriate-	
(a) set out time periods within which the measures contemplated in the environmental management programme must be implemented;	Section 6 - 10
(b) contain measures regulating responsibilities for any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of prospecting or mining operations or related mining activities which may occur inside and outside the boundaries of the prospecting area or mining area in question; and	Section 12 and 13 Appendix E
(c) develop 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.*	Sections 14 and 15
(4) The Minister of Minerals and Energy may not grant an environmental authorisation, unless he or she has considered any recommendation by the Regional Mining Development and Environmental Committee	Not applicable to the project
(5) The Minister, the Minister of Minerals and Energy, an MEC or identified competent authority may call for additional information and may direct that the environmental management programme in question must be adjusted in such a way as the Minister, the Minister of Minerals and Energy or the MEC may require.	All comments obtained from Stakeholders will be incorporated into this document upon conclusion of the Public Participation Process.

(6) The Minister, the Minister of Minerals and Energy, an MEC or identified competent authority may at any time after he or she has approved an application for an environmental authorisation approve an amended environmental management programme.	Not applicable to the project at this stage
(7) The holder and any person issued with an environmental authorisation-	
(a) must at all times give effect to the general objectives of integrated environmental management laid down in section 23 (Of the NEMA);	Section 12 Appendix E
(b) must consider, investigate, assess and communicate the impact of his or her prospecting or mining on the environment;	
(c) must manage all environmental impacts- *(i) in accordance with his or her approved environmental management programme, where appropriate; and* *(ii) as an integral part of the reconnaissance, prospecting or mining, exploration or production operation, unless the Minister of Minerals and Energy directs otherwise;*	
(d) must monitor and audit compliance with the requirements of the environmental management programme;	
(e) must, as far as is reasonably practicable, rehabilitate the environment affected by the prospecting or mining operations to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and	
(f) is responsible for any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of his or her prospecting or mining operations or related mining activities which may occur inside and outside the boundaries of the prospecting or mining area to which such right or permit relates.	

1. DOCUMENT DETAILS

SES Project Ref. No:	CT09/Krans/DEMPR/03/26
Conditions of Use:	This report is the property of the sponsor, *Sharples Environmental Services cc* (*SES*), who may make allowance to publish it, in whole provided that: Approval for copy is obtained from *SES*. *SES* is acknowledged in the publication. *SES* is indemnified against and claim for damages that may result from publication of specifications, recommendations or statements that is not administered or controlled by *SES*. That approval is obtained from *SES* if this report is to be used for the purposes of sale, publicity or advertisement. *SES* accepts no responsibility for failure to follow the recommended program.
Disclaimer	**This Environmental Management Programme has been compiled in line with Appendix 4 of Environmental Impact Assessment (EIA) Regulations of 2014, as amended (GNR 326 of 2017). This EMPr has been submitted to the Competent Authority as part of the EIA process followed in terms of the EIA Regulations of 2014, as amended. Even though numerous renditions of this report exist, this report (in its final state), aims to replace any other version of this document, upon authorisation of the project by the Western Cape Department of Environmental Affairs and Development Planning (WCDEADP)* **All technical developmental information contained in this EMPr was provided by Krans Development (Pty) Ltd and SES does not take any responsibility regarding the accuracy of the information.* **This EMPr and the preliminary impacts identified is based on the expected sensitivity of the receiving environment based on the observations made by the appointed Environmental Assessment Practitioner (EAP) and the specialists qualified to make such interpretations.*

2. ABOUT THIS EMPR

This document is intended to serve as an implementing guideline to be used by *Krans Development (Pty) Ltd* during the pre-construction, construction, and post-construction phases of the proposed mixed-use development. This document provides measures that must be implemented to ensure that any environmental degradation that may be associated with the proposed development is avoided, or where such impacts cannot be avoided entirely, are minimised and mitigated appropriately.

This Environmental Management Programme (EMPr) has been prepared in accordance with Appendix 4 of the Environmental Impact Assessment (EIA) Regulations of 2014, as amended (Government Notice Regulation [GNR] 326 of 2017; GNR 517 of 2021), which stipulates the minimum requirements of an EMPr, Section 24N of the National Environmental Management Act, 1998, as amended (Act No. 107 of 1998), and with reference to the "Guidelines for Environmental Management Programmes" published by the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP, 2005).

In line with the mitigation hierarchy (see Figure 1), the overarching goal of this EMPr is to anticipate and provide measures that must be implemented to ensure that any environmental impact that may be associated with the development is avoided. Where such impacts cannot be avoided entirely, such environmental impacts must be minimised and mitigated appropriately. The mitigation hierarchy was considered during the EIAR planning process, to appropriately manage environmental impacts.

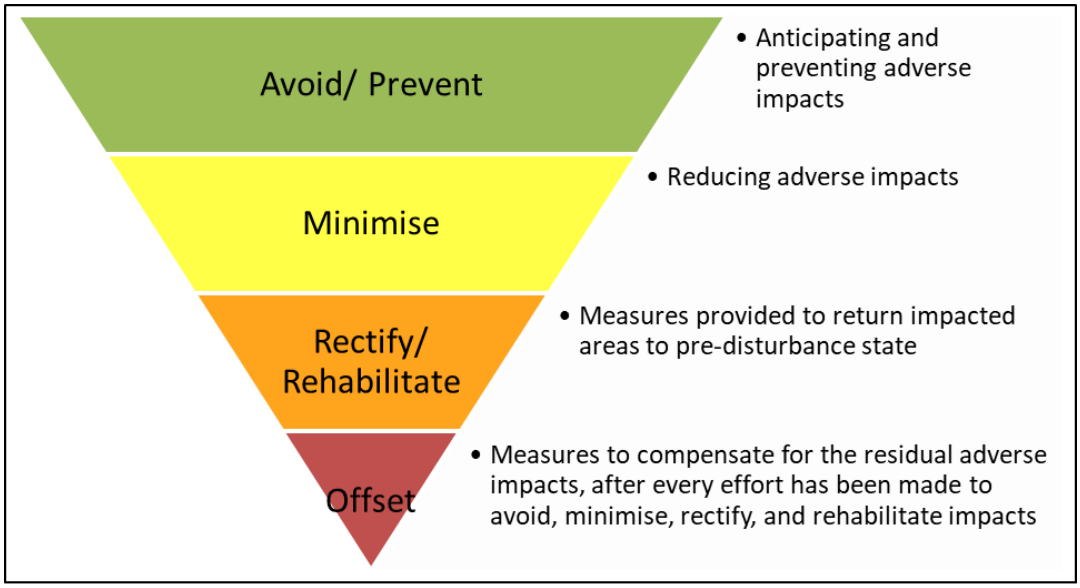


Figure 1. Mitigation hierarchy

It is important to note that not only is the EMPr designed to manage the physical establishment of the development *per se*, but also acts as a tool which can be used to manage the environmental impacts of the development.

Hierarchy level		Description in relation to the proposal
1	Avoid	The anticipated impact of the project will be cumulatively low, as the sensitive features in the landscape would be avoided.
2	Minimise impacts	The recommended mitigation measures of the various specialists reports in addition to the mitigation measures provided in the EMPr will lead to the minimisation of the impacts of the construction phase.
3	Rectify	The rehabilitation and species management measures in the EMPr are provided to return the impacted areas back to a functional state, through the implementation of a Vegetation Rehabilitation and Alien Invasive Management Plan, respectively. The Applicant will be responsible for rectifying any non-compliances with the conditions of the EA and EMPr.
4	Reduce	The environmentally sensitive areas identified by the specialists will either be avoided or managed in accordance with the recommendations of the specialists.
5	Offset	In June 2023, the Department of Forestry, Fisheries and Environment (DFFE) promulgated the National Biodiversity Offset Guidelines in terms of the National Environmental Management Act. 1998, as amended (Act No. 107 of 1992). Based on the National Biodiversity Offset Guidelines, 2023 (GN 3569 of 2023), an offset is required where the residual impacts are Medium or High. Based on the findings of the specialist assessments (specifically those relating to the ecosystems identified, as per the definition of the beforementioned guidelines), all impacts on the biodiversity component of the proposed project can be mitigated to be lower than the threshold necessitating a biodiversity offset. Hence, no offset will be required for the proposed project.

The rehabilitation, mitigation, management and monitoring measures prescribed in this EMPr must be seen as binding to the *Proponent*, and any person acting on its behalf, including but not limited to agents, contractors, employees, associates, guests or any person rendering a service to the development site.

2.1. Environmental legislative requirements of the proposed infrastructure

The EIA Regulations of 2014, as amended (GNR 326 of 2017; GNR 517 of 2021), as promulgated in terms of the National Environmental Management Act, 1998 (NEMA; Act No. 107 of 1998), gives effect to the Constitution of the Republic of South Africa by providing a framework for co-operative environmental governance and the environment. NEMA requires that an environmental authorisation (EA) be granted by a competent authority (CA) before the commencement of an activity listed in terms of the EIA Regulations of 2014, as amended.

Since this development proposal triggered listed activities in terms of the EIA Regulations of 2014, as amended, in terms of Listing Notice 1, 2 and 3 of 2014, as amended, an Environmental Impact Assessment was undertaken. This EMPr acts as a standalone document submitted with the Environmental Impact Assessment Report submitted to the Western Cape Department of Environmental Affairs and Development Planning (DEADP) for the purpose of obtaining Environmental Authorisation.

The following listed activities will be triggered in terms of the relevant Listing Notices:

Table 1. Listed Activities triggered in terms of Listed Notice 1, 2 and 3 of 2014, as amended.

Activity #	Listing Notice 1. Description of Activity as per GN No. R 327	Reason for Listing
9	*The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water –* *(i) With an internal diameter of 0.36 metres or* *With a peak throughput of 120 litres per second or more.*	The proposed development is not located in the built environment of the Bitou Local Municipality. This activity would potentially be relevant to the proposed development. The proposed development, it is likely that the proposed associated infrastructure will exceed the triggering capacities.
10	*The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes –* *(i) With an internal diameter of 0.36 metres or* *(ii) With a peak throughput of 120 litres per second or more.*	The proposed development is not located in the built environment of the Bitou Local Municipality. This activity would potentially be relevant to the proposed development. The proposed associated infrastructure will exceed the triggering capacities. Additionally, the preferred layout makes allowance for an onsite sewer pump station.
12	The development of (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 If no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.	The proposed development will see to the establishment of infrastructure within the 30 m buffer of a watercourse with an overlapping extent of approximately 537 m^2.
19	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 a watercourse.	As the proposed development will see to the construction of a sewer pipeline through the watercourse located on portion 7 of the Farm Krans Hoek 432. The total length of the interception with the watercourse and its associated buffer will be 39 m (the width of the watercourse itself at that point is 14.2 m). In order to install the pipeline, material will be moved in the watercourse, such movement will exceed the threshold of this activity.
27	*The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for –* *(i) The undertaking of a linear activity; or* *(ii) maintenance purposes undertaken in accordance with a maintenance management plan.*	It is anticipated that the development footprint will result in clearance of approximately 36 ha of indigenous vegetation (the remainder of the proposed development extent will be allocated to public and private open space). The remaining extent of the development area

		will be allocated to public and private open space.
28	*Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.*	The proposed development entails the establishment of a mixed-use development on agricultural land with an area of approximately 40.3 ha. The proposed development is located within the urban edge of the Local Municipality, however, the site does not lie within the built environment.
Activity	**Listing Notice 3. Description of Activity as per GN No. R 324**	**Reason for listing**
4	The development of a road wider than 4 metres with a reserve less than 13.5 metres (i) within areas outside urban areas (aa) Areas containing indigenous vegetation.	The two main access roads leading through the proposed development will have a width of 20 m. The combined length of the proposed main access roads will be 955 m. The internal road network will have a width of 10 m. Clearance of the areas required for the roads will require the removal of indigenous vegetation.
12	The clearance of an area of 300 square metres 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. i. Western Cape outside urban areas (i) in Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity.	The proposed development will see to the clearance of approximately 36 ha (the remaining extent of the proposed development area will be allocated to public and private open space) of indigenous vegetation that forms part of the South Outeniqua Sandstone Fynbos. This ecosystem has not been listed as a threatened ecosystem in terms of the Revised List of Ecosystem that are Threatened and in Need of Protection. The project is, however, located within a Critical Biodiversity Area as promulgated in terms of the Western Cape Biodiversity Act, 2021 (Act No. 6 of 2021).
14	The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more where such development occurs – (a) If no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse. ii. Western Cape outside urban areas (ff) in Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity.	The proposed development will see to the establishment of infrastructure within the 32 m buffer of a watercourse with an overlapping extent of approximately 537 m^2. The watercourses identified by the appointed specialist correlates with the Ecological Support Areas delineated by the Western Cape Biodiversity Spatial Plan (WCBSP, 2023).
	Listing Notice 3. Description of Activity as per GN No. R 324	**Reason for listing**
15	The **clearance of an area of 20 hectares or more of indigenous vegetation**, excluding 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.	The proposed development will see to the clearance of approximately 36 ha of indigenous vegetation (the remainder of the proposed development footprint will be allocated to public and private open space).

2.2. Important caveat to the report

In the past, some developments have had a devastating impact on the environment even though they have had EMPrs in place, while other developments have had a low impact even though no management plans have been compiled.

The Implementing Agent and the attitude of the construction team play an integral role in determining the impact a development will have on the environment. The independent Environmental Control Officer (ECO) needs to ensure that all role-players are aware of the constraints that the EMPr places on the development and the construction team and are prepared to be actively involved in

implementing these constraints. The end result relies on co-operation, mutual respect and understanding of all parties involved.

3. HOW TO USE THIS DOCUMENT

It is essential that this EMPr be carefully studied, understood, implemented, and adhered to as far as reasonably possible, throughout all phases of the proposed development. The *Holder* must retain a copy of this EMPr, and an additional copy must be kept on site at all times during the pre-construction, construction and post-construction / rehabilitation phases of the proposed upgrade project.

This EMPr must be included in all contracts compiled for engineers, contractors and subcontractors employed by the *Proponent*, as this EMPr identifies and specifies the procedures to be followed by engineers and other contractors to ensure that the adverse impacts of construction and maintenance activities are either avoided or reduced. Appointed contractors must make adequate financial provision to implement the environmental management measures specified in this document.

This EMPr must be seen as a working document, which may be amended as and when needed to accommodate changing circumstances on site or in the surrounding environment, or to accommodate requests/ conditions issued by the DEADP. Amendments to this EMPr must first be approved by the Competent Authority, in writing, before being implemented.

4. DETAILS OF THE EAP & TECHNICAL/SPECIALIST INPUT

This EMPr was compiled by Sharples Environmental Services cc (SES). SES was established in 1998 and has been actively engaged in the fields of environmental planning, assessment and management. SES advises on private, corporate and public enterprises on a variety of differing land use applications ranging from large-scale residential estates and resorts to golf courses, municipal service infrastructure installations and the planning of major arterials. Our consultants have over 20+ years of combined experience and we operate in the Southern, Eastern and Western Cape regions.

A brief description of the Environmental Assessment Practitioners (EAP) has been included below, as per Table 1, and a detailed Curriculum Vitae has been included in Appendix A.

Table 1: EAP Details.

Role:	Name:	E-Mail Address:	Qualifications:	Registration/ Memberships	YEARS OF EXPERIENCE
Responsible EAP	Ms. Madeleine Knoetze	madeleine@sescc.net	B.Sc. Environmental Sciences (Geology and Geography) (NMMU)	IAIA (SA) EAPASA (Reg nr. 2021/3230)	10+ years
Overseeing EAP	Mrs. Betsy Ditcham	betsy@sescc.net	B.Sc. Honours (Wildlife Management) (UP) B.Sc (Zoology and Ecology (UCT)	IAIA (SA) EAPASA (Reg Nr. : 1480)	16+ years

5. DESCRIPTION OF THE ACTIVITY

Krans Development (Pty) Ltd proposes to construct a mixed-use development including associated service infrastructure on Portions 7 and 8 of the Farm Krans Hoek 432 (as per Figure 2 below). **These properties fall within the municipal urban edge as per the Bitou Local Municipality Spatial Development Framework (BSDF, 2022, as approved in 2023) (Please note a revised SDF has not been adopted since the submission and acceptance of the Final Scoping Report)**.

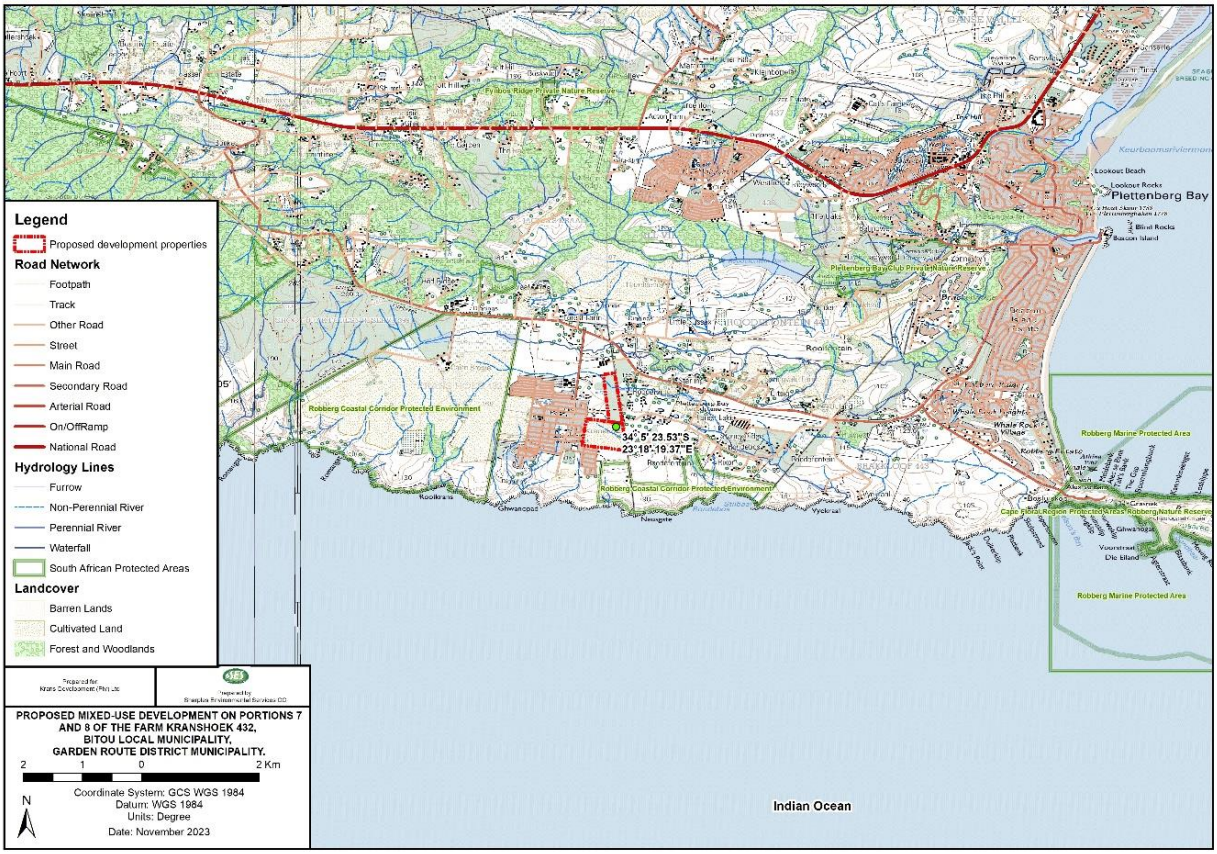


Figure 2: The proposed site for the mixed-use development (red border).

It is proposed to construct approximately 863 erven including a mix of affordable housing and business properties, schooling facilities (including creche's), places of worship, and Public & Private Open Spaces. The Open Space Zones account for > 18% of the development proposal. The following is proposed to be developed as per the **proposed preferred development layout plan**:

Table 2: Size and number of each typology proposed for the mixed-use development.

Development Proposed	% coverage	Up to Size (ha)
General Residential Zone I: Group/Town Housing	48.2 %	19.42
Community Zone 1: Place of Instruction	8.9 %	3.58
Community Zone 2: Place of Worship	1.1 %	0.44
Business Zone 3: Service Station (with Consent Uses)	1.1 %	0.43
Open Space Zone 1: Public Open Space	4.3 %	1.71
Open Space Zone 2: Private Open space	16.5 %	6.67
Utility Zone: Utility Service	0.1 %	0.04
Transport Zone 2: Public Road	4.8 %	1.94
Transport Zone 3: Private Road	15 %	6.09
TOTAL DEVELOPMENT FOOTPRINT		**±40.32 ha**

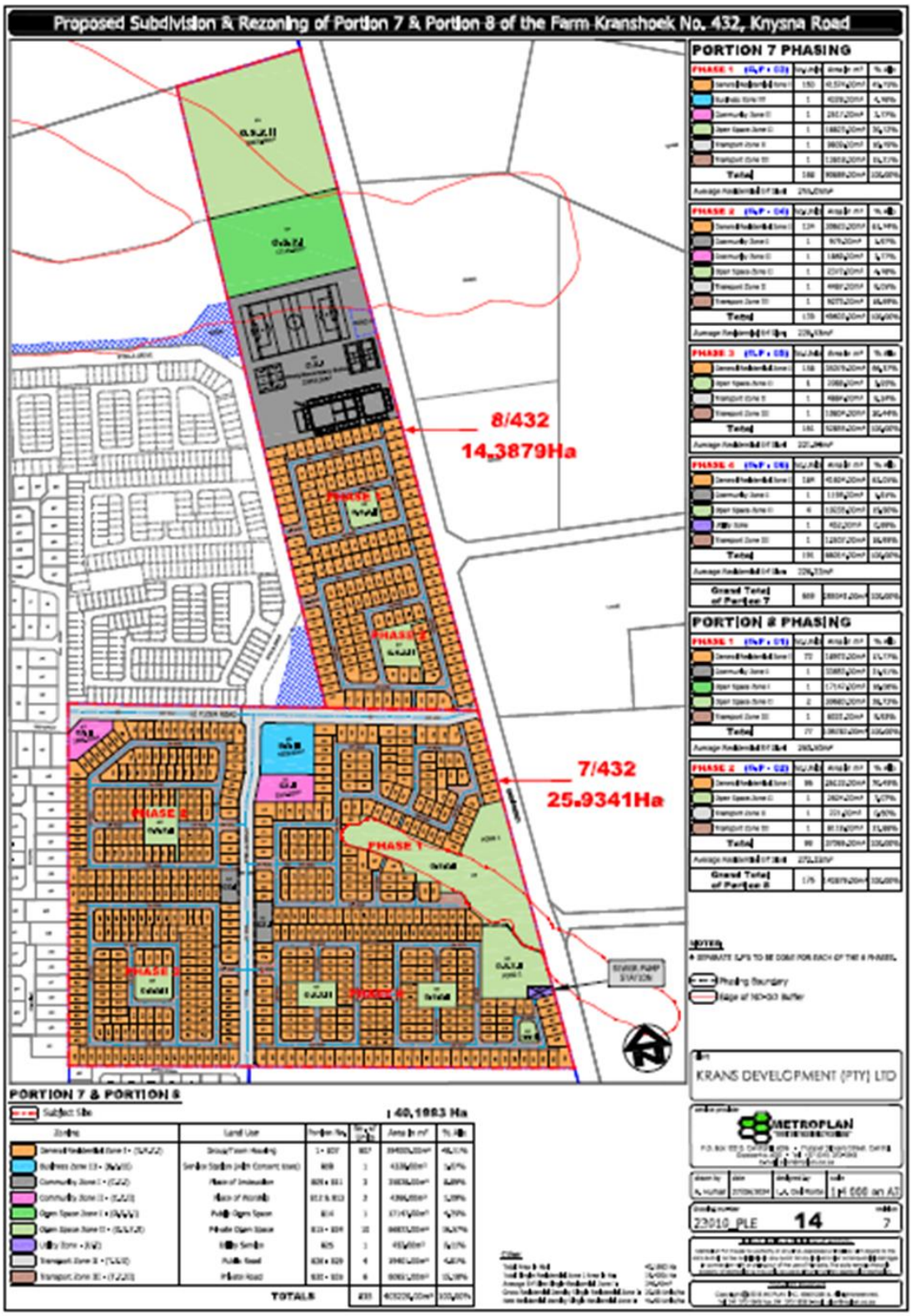


Figure 2. Proposed preferred site development plan.

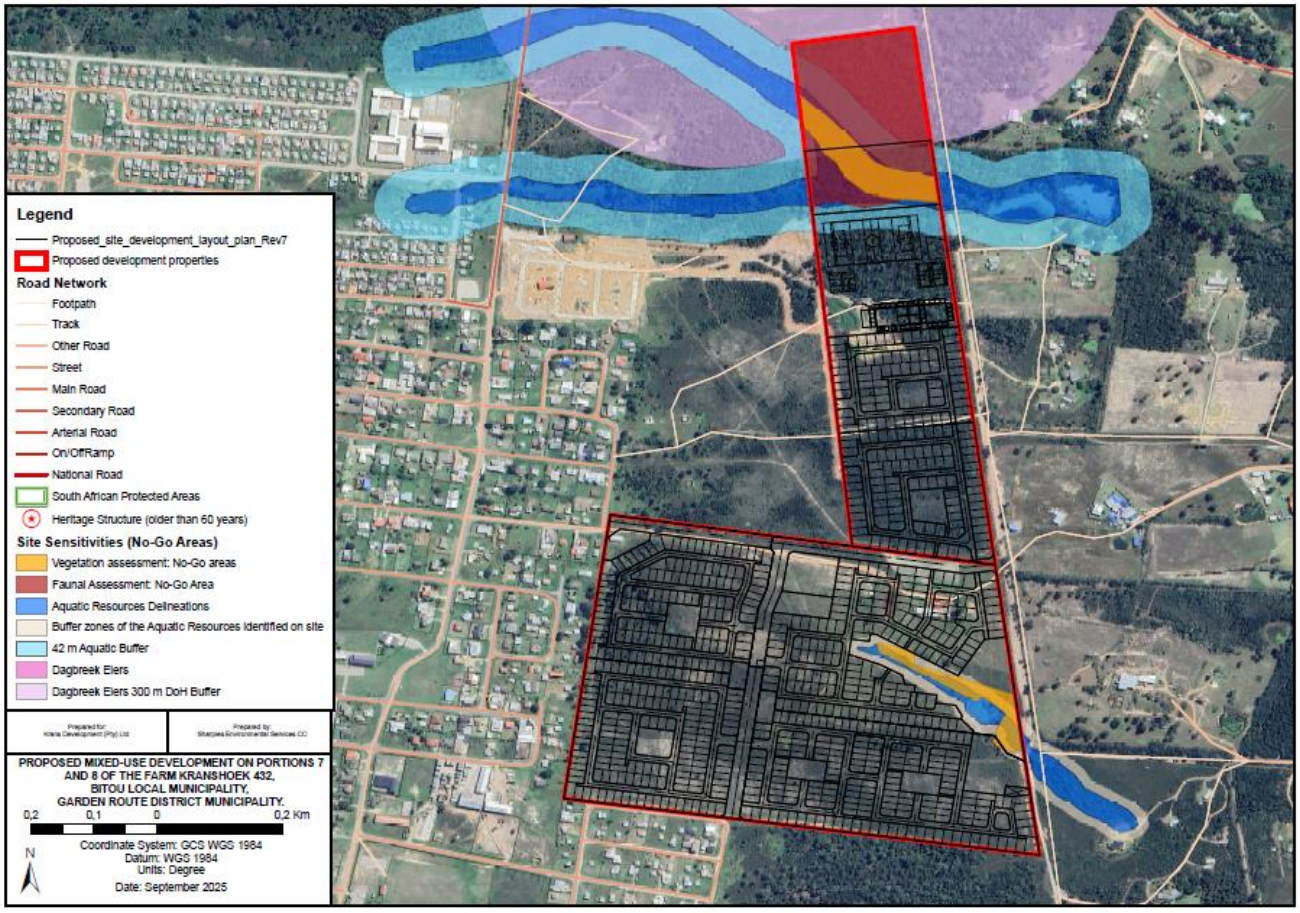
6. SUMMARY OF FINDINGS OF THE SPECIALISTS

The following sensitive features were identified by the various specialists:

- Aquatic Biodiversity Sensitivities:
  - Three Hydrogeomorphic (HGM) units were identified within the study area. The northern most HGM unit (HGM 1) corresponds to the Aquatic Ecologic Support Area (ESA) 1 identified on site, whereas the southern HGM unit corresponds with the ESA 2 (HGM 3).
  - A 42 m buffer area must be maintained along the main edge of the northern system (HGM 1 and 2) and a 15 m buffer area must be maintained along the main edge of the southern system (HGM 3).
  - Limited activities are to be permitted within the buffer areas. Specifically, within the 42m buffer area of the northern system, the specialist indicated that a sports field would be permissible, however, the areas are to be considered No-go for all other infrastructure (including stormwater outlet infrastructure).
- Terrestrial Biodiversity and Plant Species sensitive areas:
  - During the site visit, the terrestrial biodiversity specialist identified only one vegetation type of high sensitivity. This vegetation type is the aquatic areas on site.
  - In the northern most reaches of the development site (Portion 8), a stand of invasive tree species was identified. For the most part, the specialist indicated that the site is covered by degraded fynbos vegetation (in various stages of degradation) and fallow lands (as a result of recent agricultural practices).
  - No buffer areas were applied to the areas of high sensitivity and the specialist did not highlight any plant species of conservation concern.
  - The watercourse delineation (of the Aquatic Biodiversity Specialist) was adopted for the proposed development, and the Terrestrial Biodiversity specialist was afforded the opportunity to comment on the revised layout. No further comments or changes were made regarding the layout.
- Animal Species Sensitive areas:
  - The animal species specialist identified various habitat types within the proposed development site. The most notable habitat areas were the aquatic habitat in the northern reaches of Portion 8 and the stand of alien invasive species located north thereof.
  - The sensitivity of these two units were informed by the presence of subpopulation of the Vulnerable species, *Chlorotalpa duthieae* (Duthie's golden mole).
  - Subsequently, the specialist indicated that a buffer would be required around these habitats. After discussions with the specialist, it was indicated that a 30 m buffer would be sufficient. It was indicated that no buildings would be allowed to occur within the 30 m buffer. However, low impact activities would be permissible.
  - The revised layout was submitted to the specialist, and no further changes or comments were made regarding the layout.
- Heritage Sensitive areas:
  - During the site visit a building older than 60 years was identified on site. Therefore, requiring a permit in terms of the NHRA.
  - Confirmation has been received from the local community regarding the historical significance of the building and it was subsequently confirmed that the building holds no historical significance for the area.
  - A demolition permit will be applied for, and the area has been incorporated into the proposed layout.

- The revised layout was submitted to the specialist, and no further changes or comments were made regarding the layout.

- <u>Other Sensitive areas:</u>
  - Due to the presence of the poultry farm, Dagbreek Eiers, located North of Portion 8, a 300 m buffer area has been adopted around the active operational are of the establishment. All buildings have been buffered by 500 m from the establishment.
  - The Western Cape Department of Health (DoH) has been identified as an Interested and Affected Party (I&AP) of the proposed development.



<u>Figure 3. Site sensitivity overlays.</u>

7. GENERAL ENVIRONMENTAL MANAGEMENT

The following general management measures are intended to protect environmental resources from pollution and degradation during all phases of the project life cycle. These measures must be implemented as and where applicable, reasonable and practicable during the pre-construction, construction and post-construction rehabilitation and operational (maintenance) phases of the proposed development.

7.1. Code of Conduct

The purpose of the Code of Conduct (CoC) is to minimise the impact of the activities associated with the construction phase on the environment. The rules and regulations prescribed in this CoC are intended to ensure that the impacts on the environment are not prejudiced by the construction activities. Failure to adhere to, or any breach of the conditions within the CoC will result in a fine being levied against the offending or defaulting party / individual.

Labourers appointed during the construction phase must conserve the natural environment, endorsing the principles of sustainable use and minimum impact. They must also be sensitive to the impact of their operations on the environment within which they work and, in doing so, minimise any adverse impacts.

This EMPr forms an integral part of the activities during the construction phase and as such, is legally enforceable. In addition to the restrictions and controls provided for in this EMPr, the environmental controls comprise of the following:

- **Engineers**
  Unless otherwise stated by the *Holder* of the Environmental Authorisation (hereafter referred to as the *Holder*), only a registered engineer must be appointed for the construction phase of the project. The engineer must provide work or services of quality and scope, and to a level, which are commensurate with accepted standards and practices. The engineer must be impartial in decision-making, provision of advice and judgement.
- **Contractors and sub-contractors**
  Unless otherwise determined, only appropriately registered contractors must be appointed. It will be the responsibility of the *Holder* / engineer to ensure that the contractors abide by and comply with the rules and regulations of the Code of Conduct. Contractors shall be responsible for their sub-contractors and employees whilst they are on the development property at all times.
- **Rules and Regulations**
  It is of vital importance that engineers, and contractors understand and acknowledge that they are working on a site that has undergone an environmental assessment, and if authorised will require compliance with all relevant permits/licenses and this EMPr. The role players should agree to conform to all environmental controls specified in this EMPr, and any additional environmental permits/licenses, as well as any additional input by the ECO.

In addition to the EMPr, the environmental controls comprise of the following:

- **Plan Controls**
  A copy of the approved and signed project plans must be available on site during the construction phase of the proposed development. Variations of the building plans must be approved by the engineer / *Holder* prior to being implemented.

- **Site Tidiness**
  The contractor must always keep the appearance of the site neat and tidy. Building rubble must be removed from site at regular intervals, and litter must be removed from the site daily (if not, stored in appropriate receptacles). Refuse bins must be available on site which waste can be placed in. The bins must be emptied on a regular basis, as required, and the waste taken to a licenced local waste disposal facility.

- **Safety**
  The contractor must comply with the Health and Safety Act (Act No. 85 of 1993), as amended (OSHA), together with such regulations promulgated thereunder.

  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.

7.2. Site Access and Traffic Management

All construction vehicles need to adhere to traffic laws and regulations. Drivers must be sensitised to the fact that they are working in an area with a potentially high volume of foot and vehicle traffic. The speed of construction vehicles and other heavy vehicles must be strictly controlled to avoid dangerous conditions for other road users within the Kranshoek area. As far as possible, care must be taken to ensure that the local traffic flow pattern is not significantly disrupted, and vehicle operators therefore need to be educated in terms of "best-practice" operation in order to minimise unnecessary traffic congestion or dangers. These practices include, but are not limited to:

- Not unnecessarily obstructing the access point or traffic lanes used to access the site;
- Considering the load carrying capacity of road surfaces; and
- Adhering to all other prescriptive regulations regarding the use of public roads by construction vehicles.

Adequate signage that is both informative and cautionary to passing traffic must be erected to warn other road users (motorists and pedestrians) about the presence of construction vehicles, particularly at the point where construction vehicles enter/ exit the site warning them of the construction. Signage would need to be clearly visible and include, amongst others, the following:

- Identifying the working area as a construction site;
- Cautioning against relevant construction activities;
- Prohibiting access to the construction site;
- Clearly specifying possible detour routes and / or delay periods;
- Possible indications of time frames attached to the construction activities, and;
- Listings of which contractors are working on the site.

Other mitigation measures include:

- The ECO must do awareness training with the contractors and all labourers that will be working on site and must highlight the traffic related risks before construction commences.
- Where possible, construction traffic that may obstruct traffic flow on the surrounding roads must be scheduled outside of peak traffic times.
- Ensure appropriate behaviour of operators of construction vehicles.
- If needed, appropriate traffic management measures and/ or points men (traffic marshals) must be utilised to assist vehicles entering/ exiting the site.

7.3. Site Demarcation

The working areas should be clearly demarcated by appropriate means during the pre-construction or construction phases of the development, as appropriate.

- **Construction Working Area**
  Prior to the commencement of any land-clearing or construction activities, the ECO must be advised of the project programme providing an indication of when clearance and earthworks will commence.

  Prior to the commencement of any land clearance or construction activities, the outer boundary of the working area must be surveyed and demarcated by means of an appropriate method. This demarcation boundary is to ensure that land clearing and construction activities are restricted to only the area strictly required for the proposed activities, and to prevent unnecessary disturbance of soil surfaces and vegetation outside of the approved footprint.

  The demarcation should be retained and maintained for the duration of the construction period or up until the conclusion of the rehabilitation phase. If changes to the extent of the working areas are required, such changes may only be applied once the approval of the appointed ECO, Site Engineer or where applicable, the Competent Authority (DEADP) has been obtained.

- **No-Go Areas**
  As par to the proposed development, the following features and no-go areas were identified (please see the image below):

  - Aquatic Specialist – Three (3) watercourses with their respective buffers were identified, these watercourses have been excluded from the proposed development footprint, with the exception of the allowance of the sewer infrastructure as assessed by the appointed specialist. These sensitivities align with the no-go area presented by the terrestrial biodiversity specialist.

    - A 3 m working corridor shall apply in proximity to any watercourses identified by the aquatic biodiversity specialist, specifically as it pertains to sewer infrastructure proposed within the watercourse located on Portion 7 of the Farm Krans Hoek 432. All areas beyond the indicated corridors must be considered as no-go areas.

  - Animal Specialist – The area toward the north (specifically the drainage line and it's associated 30 m buffer) is considered no-go in terms of hardstand infrastructure due to the presence of Duthie's Golden Mole.

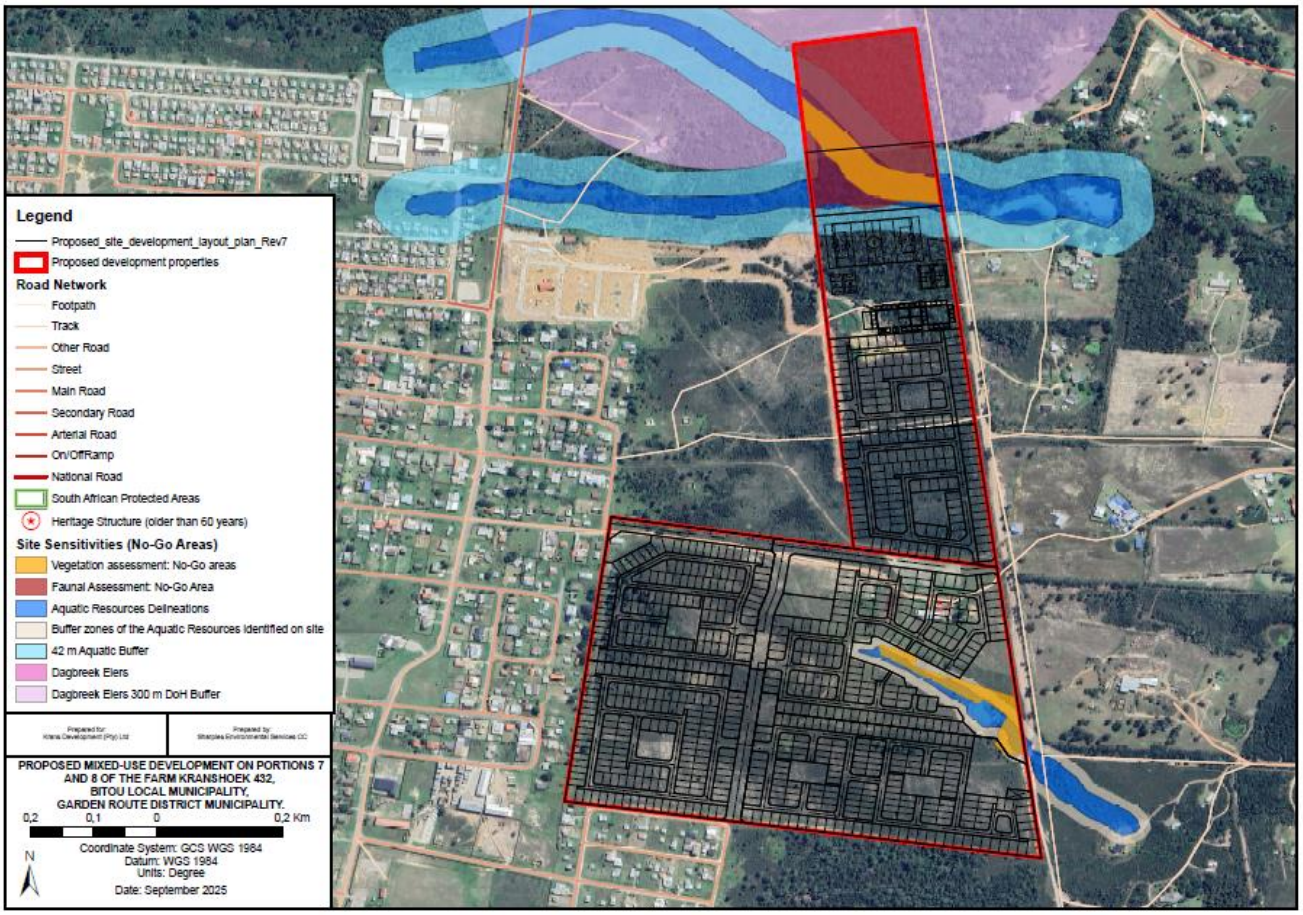


Figure 4. Site sensitivity overlays (indicating no go areas). Please note the area located towards the north must be managed in accordance with the management plan provided in Appendix M).

It is recommended that the working areas be demarcated with a suitable material that can be easily identified and noticed. The method of demarcation is to be determined by the ECO and the appointed Contractor. Danger tape flagging (pieces of danger tape tied to twine or rope) may be utilised as a short-term solution. However, the use of only danger tape is not recommended for long-term demarcation as this will easily become untidy and blown away by the wind resulting in pollution.

For the purpose of this project, all areas beyond the working areas stipulated above are considered no-go areas.

No-go areas must be considered as off-limits to all construction workers, vehicles and machinery during all phases of the development. No vegetation may be cleared beyond the working areas as stipulated above (unless in accordance with an approved alien invasive management plan and under the supervision of the ECO), and no dumping of any material (waste, topsoil, subsoil etc.) may occur in these areas. Construction workers must be informed of the no-go areas, and if necessary appropriate signage can be used to enforce the demarcation. Any interaction with no-go Areas must be consulted with between the Contractor and ECO prior to any actions.

No vegetation clearing shall take place without approval of the method statement by the Resident Engineer (ER). No vegetation clearing shall take place until the site boundaries and

"No-Go" areas are clearly demarcated. Before clearing of vegetation, the Contractor shall ensure that all litter and non-organic material is removed from the area to be cleared. Vegetation clearing of the site shall be limited as far as possible. Clearing may not extend beyond the approved proposed development footprints assessed as part of the Environmental Impact Assessment Process. If large areas are to be cleared, 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. All remaining alien invasive vegetation must be removed and disposed of at an approved landfill site.

- **Demarcation of the Site Camp**
  The area chosen for the site camp and associated facilities must be the minimum area reasonably required to accommodate the site camp facilities, and which will involve the least disturbance to the environment. It is recommended that easily accessible, transformed areas must be used for the site camp. Site selection must be done in consultation with the ECO.

7.4. Site Camp and Associated Facilities

The set up and organisation of the site camp is paramount to ensuring compliance with the requirements of the EA, if approved, and the EMPr. An environmental site file is to be created by the contractor and must be situated within the site camp throughout the construction phase and must be kept by the *Holder* following the conclusion of the construction phase. The environmental file is to include the following as a minimum requirement;

- A copy of the Environmental Authorisation.
- A copy of the Water Use Licence in terms of the National Water Act, if required, or any other relative permits (Workplans and licences).
- A copy of the approved EMPr.
- Updated waste slips (waste transporter accreditation certificate, manifest and safe disposal certificate).
- Disposal slips or cleaning slips (ablution cleaning).
- All Environmental Monitoring Reports (EMRs) and ECO instructions.
- Copies of Environmental induction register/s.
- The Protocol for Chance Palaeontological Findings.
- A Complaints Register.
- Updated method statements.
- Any and all emergency procedure/s applicable to site activities.
- An Incident Register.

Method Statements (MS) are written submissions by the Contractor to the Resident Engineer (RE) (with input from the ECO) in response to the requirements of this EMPr or to a request by the RE or ECO. A minimum requirement will consist of the listed MS's below.

The ECO and / or Competent Authority have the authority to request method statements for activities, including but not limited to:

- Establishment of site camp and stockpile area.
- Site clearing
- Cement/ concrete batching, disposal and emergency contingencies.
- Topsoil and sub-soil storage/ stockpiling.

- Storage of fuels and hazardous chemicals and emergency contingencies.
- Waste management system.
- Storm water management and control.
- Dust Mitigation
- Alien invasive plant species management.
- Fire Control & Fire Emergency Plan.
- Emergency preparedness plan / emergency response procedure.
- Post-construction rehabilitation.

Further MS's may be requested by the RE or ECO. The Contractor shall be required to prepare method statements for several specific construction activities and/or environmental management aspects as specified.

It is the Contractors responsibility to ensure that the required method statements are drafted and submitted. The Contractor shall not commence with an activity for which a method statement is required until the RE and the ECO 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 an MS be rejected this will be done so with comment. The seven-day submission period will commence once again on re-submission of the MS.

Failure to submit a MS (either required in terms of the EMPr, or as required before specific works highlighted by the ECO or RE), may result in suspension of the activity concerned until such time as a MS has been submitted and approved. An approved MS 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 MS shall be rehabilitated at the contractor's cost and to the satisfaction the ECO and RE.

The method statements shall cover relevant details with regard to:

- Construction procedures (including vegetation clearance, earthworks, works within watercourses and installation of services) 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.

The following general management measures pertaining to the set-up, operation and closure of a site camp must be applied where appropriate, reasonable and practicable:

7.4.1. Fencing & Security

The site camp area must be secured to prevent any unauthorised individuals from entering the site camp and possibly getting injured or posing a safety and/or security risk. Adequate signage must be displayed, designating the site office / camp as a restricted area accessible only to personnel appointed to the construction works of the project. If required, the boundary of site camp should be clearly demarcated and the camp access controlled through the use of a gate or other approved method. A site register is recommended to record any daily visitors and activities, for record keeping purposes.

- **Fire Fighting Equipment**

No less than 2 fire extinguishers must be present at the site camp. The extinguishers must be in a working condition and within their service period. A fire extinguisher must always be present wherever any "hot works", if any, (e.g. welding, grinding etc.) are taking place. It is recommended that all construction workers receive basic training in fire prevention and basic fire-fighting techniques and are informed of the emergency procedure to follow in the event of accidental fires. These may either be in the form of proper training or by means of Toolbox Talks facilitated by the On-site Safety Officer.

Open fires should be prohibited on site. However, it is noted that despite this, incidents may arise where fires are created after hours by security, and labour may attempt to smoke on site. In these cases, measures should be taken to ensure that activities are managed appropriately.

Should the contractor choose to, he/she may designate a smoking area within the site camp, of which the contractor is solely responsible for the management of this activity on site, and any incidents that may occur. It must contain the following features:

- Appropriate signage.
- A barrel/bucket filled to 50% capacity with sand, for disposal of used cigarettes.
- An appropriately weighted lid, that cannot be easily displaced by volatile weather conditions.
- The bin and designated area must be positioned in such a manner that it is not directly affected by heavy winds.
- This bin must be emptied as is necessary and must not be allowed to reach 75% capacity.

- **Waste Storage Area**

Sufficient bins for the temporary storage of construction related waste must be provided inside the site camp and/or at the working area and must be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. Sufficient signage and awareness must be created to ensure that these bins are properly used.

- **Hazardous Substances Storage Area, spills and leaks**

Fuels, chemicals, lubricants and other hazardous substances must be stored in a demarcated, secured, bunded and clearly sign-posted area within the site camp. Sufficient signage and awareness must be created to ensure that these bins are properly used. It must be ensured that all hazardous storage containers and storage areas comply with the relevant SABS standards to prevent leakage. Ensure that when substances are transferred, this is done on an impermeable and/or bunded surface, to contain any spillage. Spillage, should it occur, must be disposed of appropriately.

All hazardous materials or substances (e.g. petrochemicals, oils, etc.) must be stored on site only under controlled conditions. All hazardous material and substances shall be stored in a secured, designated area that has restricted entry. All storage must take place using suitable containers to the approval of the RE. Hazard signs and data sheets indicating the nature of the stored materials shall be displayed

on the storage facility or containment structure. Symbolic safety signs depicting "No Smoking", "No Naked Lights" and "Danger" are to be provided, and are to conform to the requirements of SABS 1186.

Where there may be suitable storage infrastructure (existing yards and fuel tanks etc.), all necessary safety requirements in terms of bunds, spill kits and signage must be in place. Fuel storage tanks are permitted to be temporarily established on site for construction purposes provided that the contractor ensures full compliance with the following:

- All local by-laws relating to community and fire safety must be complied with. Most local authorities require that a permit be obtained from the relevant Fire Department. This permit should be kept on file.
- The storage tank capacity may not exceed 9000 litres.
- The storage tank may not be on the premises for a period exceeding that stipulated by the local authority.
- The tanks must be removed on completion of construction or once the contractor responsible for the tanks has completed their work on site.
- A tank must be erected at least 3.5 metres from boundaries, buildings and other flammable substances or combustible materials.
- A temporary tank must have a bund wall with 110% capacity of the tank's total storage capacity.
- The fuel tank shall be steel and maintained by the fuel suppliers and/or Contractor.
- The floor and wall of the bund area shall be impervious to prevent infiltration of any spilled / leaked fuel into the soil.
- The floor of the bund shall be sloped towards an oil trap or sump to enable any spilled fuel to be removed.
- The sump must have a lock off valve that can only be opened in an emergency.

Should a mini-mobile type trailer tank or bowser be used on site, the following specifications apply:

- The tank will be maintained by the fuel suppliers and/or Contractor and is to be kept clean and leak free.
- The trailer is to be kept on site with a drip tray at all times and is to be removed from site at the end of every day unless it is kept in a bund area of 110% of the tank volume.

A hydrocarbon bioremediation product approved by the RE with input from the ECO must be stored on site and near the fuel stores for any emergencies. Once a purpose manufactured hydrocarbon spill remediation product has been used or has been used to treat contaminated materials (soil, rubble etc.) it must be disposed of, with the treated material, at a facility licensed to receive such waste.

Areas for storage of fuels and other flammable materials shall comply with standard fire safety regulations and may require the approval of a fire prevention officer. The contractor must ensure that there is adequate firefighting equipment at the fuel stores and that persons are adequately trained to use this equipment.

All empty drums and externally dirty drums shall be sealed and stored in the bunded area. If fuel is dispensed from 200 litre drums, the proper dispensing equipment shall be used, and the drum shall not be tipped in order to dispense fuel. The dispensing mechanism of the fuel storage tank shall be stored in a waterproof container or within the bund area when not in use.

The location of suitable areas for maintenance and refuelling must be identified by the RE in collaboration with the ECO. The ECO must be involved in the decision and must provide guidance from an environmental perspective prior to commencement of the proposed action.

Any significant accidental release of a hazardous substance during the construction and post-construction phase of the project must be reported to the relevant authorities, including the Western Cape Department of Environmental Affairs and Development Planning's Directorate: Pollution and Chemicals Management, in terms of Section 30(3) of the NEMA.

The contractor shall ensure that all employees are aware of the procedure to be followed for dealing with spills and leaks, which shall include notifying the RE and ECO. The Contractor shall ensure that the necessary spill response hydrocarbon remediation materials (e.g. chemcap, spill-sorb, drizzat pads, enretech, OilCap or 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 RE.

The Contractor shall submit his emergency procedure 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 cleanup of spills and any damage caused by the spill shall be for the Contractor's account.

- **Potable Water**

An adequate supply of potable water must be provided to construction workers at the site camp. It is the Contractor's duty to ensure that the labour has adequate access to potable water throughout construction phase, and to monitor weather conditions, to ensure that labour has enough drinking water on hotter days. Should enough potable water not be available on warmer days, construction activities must cease, until conditions are safe to continue. To conserve water, it is recommended that buckets of water kept within the site camp and are reserved for the use of cleaning tools and machinery.

No water may be abstracted from streams, rivers, wetlands or boreholes unless the necessary water use authorisations are in place. If water is stored on site, drinking water and multi-purposed water storage facilities shall be clearly distinguished and demarcated. No water is to be wasted on site. Any leaks must be reported and repaired immediately. All pipes, taps and associated infrastructure, where made available to the Contracting team for use, are to be maintained in good working order.

- **Ablution Facilities**

Chemical toilets must be kept at the site camp, on a level surface and secured from blowing over, and must be located in such a way so as to ensure that the toilets will not cause any form of pollution. The supplied toilet facilities must comply with the requirements of the SABS and the OSHA.

The ablution facilities must not be linked to a river system/drainage lines/the ocean in any way. Toilets must be serviced regularly and kept in an orderly state. The contractor must ensure that no spillage occurs when the toilets are cleaned, serviced or moved. The toilet facilities must be emptied on a weekly basis by an appropriately registered service provider. Proof of this weekly servicing must be obtained and filed in the Environmental File on site. The contractor shall ensure that chemical toilets are emptied before the builders' holidays and that no spillage occurs when they are emptied. All contents must be removed from the site. Under no circumstances may waste be discharged into the environment or be buried on site.

Performing ablutions outside of the provided toilet facilities is strictly prohibited and the ECO would need to regularly inspect the state of the chemical toilets to ensure compliance.

The Contractor is responsible for the erection and maintenance of adequate ablution facilities and washing areas and for enforcing the use of these facilities. Under no circumstances may the natural environment be used as a toilet or cleaning area. The Contractor shall be responsible for ensuring that all ablution facilities are maintained in a clean and sanitary condition to the satisfaction of the RE. Plumbed toilets must have no leaks or malfunctioning valves. No chemicals, oils or similar construction related materials are to be disposed of via the toilets on site. Ablution facilities (chemical toilets, etc.) must be provided at all construction camp areas where there will be a concentration of labour. Toilet paper must be provided.

- **Eating & Rest Area**

A dedicated area within which construction workers can rest and eat during breaks must be provided within the site camp. Alternatively, a designated area must be identified within the proposed development area to make allowance for these activities. This area must be agreed upon by the RE, ECO and the *Holder*. Seating, shaded areas and waste bins must be provided. If none is available, the Contractor shall provide adequate temporary shade within the construction areas to ensure that site personnel do not move off site to eat. The Contractor shall provide adequate refuse bins with lids at all eating areas to the satisfaction of the RE. The bins must be weatherproof and scavenger proof and approved by the RE. If deemed necessary by the RE, the Contractor shall demarcate designated eating areas.

No feeding of wild animals shall be permitted. Food and food products are to be stored in such away so as not to attract scavenging animals.

- **House-Keeping**

The site camp and associated site camp facilities must be kept neat and orderly at all times, in order to prevent potential safety risks and to reduce the visual impact of the site during construction.

7.5. Protection of Fauna

Construction workers are to be sensitised to the fact that they may encounter fauna during the construction period. This must be included in the environmental awareness training completed with all site personnel before any construction commences. Environmental Awareness Training must educate labour on conduct in terms of faunal management throughout construction phase, including but not limited to:

- No person/s may harm, kill, capture or keep any fauna.
- Appropriate access control must be put in place to reduce the risk of animal species gaining access to the development area.
- Where possible, avoid interactions, particularly with fauna that can inflict harm. If such fauna is identified on site contact local SPCA or other animal protection and removal services.
- No domestic animals are permitted on the sites.
- Maintain good housekeeping, so that fauna cannot hide amongst waste and material.
- Workers must be made aware of the Vulnerable, Duthie's Golden Mole, species which may be encountered on site, specifically in proximity to the sensitive areas associated with the drainage line on Portion 8 of the Farm Krans Hoek 432.

If any fauna is encountered by construction workers, the Site Environmental Officer (SEO) or ECO is to be notified. If the SEO or ECO is not on site, the site manager is to be informed. Rescued fauna must be released into a nearby area of similar habitat away from any construction. Contact details for animal rescue services and/or snake wrangler, from the local area, should be available on site, in case of an emergency.

7.6. Indigenous Vegetation Clearing and Protection.

The following measures must be implemented:

- The search and rescue and management plan for the orchid species as provided in Appendix K of this EMPr.
- It is important that clearing activities are kept to the minimum and take place in a phased manner. This allows animal species to move into safe areas and prevents alien invasive encroachment, and wind and water soil erosion of the cleared areas. Blanket clearing of vegetation must be limited to the approved development footprint.
- Any alien vegetation that is cleared must be disposed of in accordance with the Alien Invasive Management Programme and in consultation with the ECO. Chipping of alien invasives must occur immediately and must not be stored on site for more than 90-days.
- Workers are NOT allowed to collect any flora species. All flora remains the property of the landowner and must not be disturbed, upset or used without their expressed consent.

Where indigenous vegetation must be cleared for the development, the following measures must be implemented:

- An Independent Environmental Control Officer must oversee compliance with all the prescribed environmental requirements and mitigation measures listed here and will be on site regularly.
- Only the areas required to fulfil the needs of the construction activities and access to the construction site must be cleared of vegetation.
- Vegetation outside of the approved footprint must not be cleared, unless permitted in accordance with the alien invasive management plan, and under the supervision of the ECO.
- Land clearing and earthmoving activities should not be undertaken during strong winds or heavy rainfall events, where possible.
- Trees and shrubs that are directly affected by the operations may be felled or cleared but only by the expressed written permission of the ECO, and under the applicable permit obtained in terms of the Nature Conservation Ordinance (19 of 1974, amended 2000), if applicable.
- Stripped vegetation should be temporarily stored during operations and to be used later to stabilise slopes/soils. This excludes alien invasive species.
- Ensure any open spaces/bare areas are kept clear of alien plant species through the adoption of an Alien Invasive Management plan.
- No unpermitted/uncontrolled fires are permitted on site.
- To limit adverse impacts to the surrounding environment, the contractor and labourers must take great care if cement is to be mixed on site. Cement is to be mixed on thick plastic sheets or in large buckets that are bunded. Any spillage must be cleaned up immediately. Cement water must also to be contained in the above manner and allowed to dry out and then removed from site. Cement water, which is highly alkaline, poses a definite threat to the soil and seed banks, should the water disperse into surrounding areas.

7.7. Alien Invasive Species Control

Several exotic invasive and other weed species were noted on the site. Existing infestations and any further spread of these species pose a negative risk to the environment by causing direct habitat destruction, increasing the risk and intensity of wildfires, and reducing surface and sub-surface water. Alien Invasive Plants require removal according to the Conservation of Agricultural Resources Act 43 of 1983 (CARA) and the National Environmental Management: Biodiversity Act (10 of 2004; NEMBA): Alien and Invasive Species Lists (GN R598 and GN R599 of 2014).

Removal of species must take place throughout the construction and post-construction phases. This does not apply to the northern areas as deemed sensitive by the various specialists. The northern area shall be managed in line with Appendix K of this report.

7.8. Topsoil and Subsoil Management

Topsoil must be removed from any area where physical disturbance of the surface will occur, including within the footprint of the development site (working area) and possibly within the site camp, ablution area, refuelling area and temporary waste storage area. Topsoil removal and stockpiling must be undertaken only after the ECO has been consulted with. The following soil management measures must be implemented:

- Topsoil & subsoil that has been excavated must be stockpiled separately, along & adjacent to the excavation areas and must be covered.
- Topsoil stockpiles must not be covered with tarpaulin, as this may smother and decrease the virility of topsoil.
- Excavated topsoil and subsoil must be stockpiled for the duration of the active construction period and utilised for the final landscaping and rehabilitation of disturbed areas on site.
- The topsoil & subsoil storage area must be located on a level area outside of any surface drainage channels outside the riparian zone, and at a location where it can be protected from disturbance and river flow/floods during construction and where it will not interfere with construction activities.
- Topsoil and subsoil stockpiles must be adequately protected from being blown away or eroded by storm water. If necessary, shade cloth or other suitable measures must be used to stabilise and protect the stockpile from wind/water erosion.
- Handling of topsoil must be minimised as much as possible, and the location of the topsoil berm must be chosen carefully to avoid needing to relocate the topsoil berm.
- Ideally, topsoil is to be handled twice only, once to strip and stockpile, and once to replace, level, shape and scarify.
- Topsoil shall be kept separate from overburden and shall not be used for building or maintenance of roads.
- Topsoil stockpiles must not exceed 1.5 m in height and must not be compacted.
- If soil stockpiles will be stored for an extended period of time, the stockpiles must be kept clear of weeds and alien vegetation growth by regular weeding, (or application of herbicides if agreed with the ECO).
- Soil material that will not be re-utilised on site may be removed from site and taken to an appropriate site for re-use or disposal.
- Note that the topsoil must be the final layer applied to a rehabilitated/ re-landscaped site, after subsoil/ spoil material has been placed and shaped on the site.
- Material Stockpiles (including imported materials and rubble) may not exceed 2 m in height.

7.9. Integrated Waste Management Approach

It is recommended that an integrated waste management system is adopted on site. The system must be based on waste minimisation and must incorporate reduction, recycling, re-use and disposal where appropriate. Separate waste bins/skips that are weather- and animal proof must be provided for recyclable waste, general waste and hazardous waste. Recovered builder's rubble & green waste may be stockpiled on the ground within the site camp, or in separate skips until removal. These bins/skips must be emptied, and the waste taken to a registered recycling facility. The receipts from the facility must be kept on file and must be available on request.

The non-recyclable and non-reusable waste (e.g. builder's rubble, etc.) generated on site must be disposed of at a landfill site licensed in terms of the applicable legislation. The waste manifest and safe disposal certificate from the facility must be kept on file and must be available on request.

7.10. Erosion Control and Stormwater Management

Stormwater must be managed in accordance with the Municipal Stormwater Management By-law and based on Sustainable Drainage Systems (SUDS). The SUDS systems attempt to maintain or mimic the natural flow systems as well as prevent the wash-off of urban pollutants to receiving waters. Further to this, the EA *Holder* or appointed contractor must ensure that:

Where necessary, Stormwater Management Plans must be developed by the Contractor (as part of the Method Statements) for the site and should include the following:

- The management of stormwater and erosion control during construction.
- The management of stormwater and erosion control as part of post-construction.
- Temporary drainage works are implemented, where/when required, to prevent sediment-laden surface water from draining into river systems in proximity to the site. Stormwater must be prevented from entering or running off site.
- Sheet runoff from access roads and the walkways is slowed down by the strategic placement of berms.
- Diversion channels should be constructed ahead of the open cuts, and above emplacement areas and stockpiles to intercept clean runoff and divert it around disturbed areas into the natural drainage system downstream of the site.

FRAME Consulting Engineers (Pty) Ltd have been appointed to compile the Stormwater Management Plan for the development, this stormwater management plan has been included as part of the assessment of the impacts of the proposed development on the environment and has aimed to avoid the environmental sensitivities for the development (this relates specifically to the operational stormwater management).

As much indigenous vegetation must be maintained and encouraged to minimise erosion;

- All soil compacted because of construction activities as well as ongoing operational activities falling outside of project footprint areas should be ripped and profiled;
- To ensure that site is not subjected to excessive erosion and capable of drainage runoff with minimum risk of scour, their slopes should be profiled at a maximum 1:3 gradient where possible;
- Rehabilitation is necessary to control erosion and sedimentation of all eroded areas (where works took place);
- It is importation that the rehabilitation of site is planned and completed in such a way that the runoff water will not cause erosion; and

The scale and nature of the erosion and stormwater control measures implemented on site must be appropriate to the conditions on site, and sufficient to achieve the desired outcomes (soil preservation, prevention of flooding, stormwater control) to the satisfaction of the ECO and RE.

The prevention of soil erosion can be initiated by designating specific areas for stockpiling of raw materials with consultation of the ECO. No stockpiling is to occur on or near slopes or water resources and all stockpiling areas must be approved by the ECO before stockpiling occurs.

Stockpiles need to be effectively managed and maintained as they have the potential to contribute to runoff and erosion. To prevent this, the following management measures must be implemented:

- Stockpiles of earth material may not be located within any storm-water drainage pathways and must be outside of the reach of potential flood waters.
- Any erosion runnels/ gulleys/ channels that form on site must be infilled with appropriate material, compacted, rehabilitated as needed and appropriate erosion control measures put in place to prevent recurrent erosion at that site. Rehabilitation of erosion channels must be ongoing during the construction phase and not left until the end of the construction period.
- It may be necessary to implement small-scale erosion protection measures at the construction site, to prevent soil erosion. Such measures may include the use of shade netting, geo-fabric, brush-packing or similar barriers in areas susceptible to erosion and along exposed slopes. The Storm Water Management Plan must adhere to the principles of sound storm water management as well as the Municipal Stormwater Management By-law and based on Sustainable Drainage Systems (SUDS). The storm water management system must be implemented on site and must be properly maintained to ensure that contaminated run-off from the construction site is prevented from flowing into the watercourse/ocean.

Cleared areas and any other area susceptible to erosion should be provided with a suitable cover and stabilised as soon as possible via the implementation of appropriate erosion control measures. This may include use of cut-off drains, temporary drainage channels, brush-packing, mulching, planting or sodding, use of environmentally benign soil binders, use of geo-textile or other coverings. The appropriate measures should be selected by the contractor in consultation with the RE & ECO.

The Contractor shall take reasonable measures to control the erosive effects of stormwater runoff. 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, can be used as an erosion protection measure. The ploughing-in of straw offers limited protection against storm water runoff-induced erosion and can 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.

7.11. Excavations and Earthworks

Any major earthworks with bulldozers and heavy machinery must be under constant supervision. Operators must be aware of all the environmental obligations, as there is always the potential to inflict damage to the sensitive areas. Any unnecessary or excessive heavy machinery movement must be kept to a minimum i.e. only what is absolutely necessary. Areas to be excavated must be clearly demarcated. Areas which have already been excavated and entail fairly significant earthworks, must be similarly demarcated to avoid the spreading of construction activities beyond the approved working areas.

All excavated material must be stored on a flat surface away from any drainage line, sloped areas or area susceptible to erosion. The location must be decided in consultation with the ECO. Stored material must be protected from wind and water erosion, and this may entail covering the material with suitable shade cloth material or similar (if and when necessary). The shade cloth may need to be weighed

down in such a manner that any stream flow is directed away from the stockpile, reducing the risk of erosion.

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

- Topsoil must be handled as described in this EMPr.
- Excavations must take place only within the approved demarcated site.
- Excavations must follow the contour lines, where possible and/or applicable.
- Where possible, excavations should be closed overnight, over weekends, holiday periods, and during any other planned site closure periods, where feasible.
- Excavations must be temporarily demarcating shade cloth or barrier fencing to obstruct visual impacts and to prevent the harm to animals or unauthorised persons that may fall into excavations.
- The construction site will not be left in any way to deteriorate into an unacceptable state.
- Once excavations have been filled with overburden and coarse natural materials and profiled with acceptable contours (including erosion control measures), the previously stored subsoil and topsoil shall be returned to its original depth over the area.
- Rehabilitation of the site shall take place according to the Vegetation Rehabilitation Programme and must occur concurrently with the construction phase.

7.12. Visual Impact

The proposed project has the potential to cause a visual impact during the construction and post-construction periods. To minimise the potential visual impact, all working areas, storage facilities, stockpiles, waste bins, elevated tanks and the site camp should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. Waste must be managed according to this EMPr. Good housekeeping practices on site must be maintained to ensure the site is kept neat and tidy. The site camp may require visual screening via shade cloth or other suitable material. The use of reflective materials and excessive lighting should be avoided, and construction vehicles must enter and leave the site during working hours (07:00-17:00).

7.13. Noise Management.

Additional noise is expected during the construction period due to construction activities. It is important that and earth-moving activities be restricted to normal construction working hours (7:00 – 17:00) as far as possible. Work on site must be well-planned and should proceed efficiently so as to limit the duration of the disturbance. This is to be done by ensuring that all equipment is in good working condition and fitted with mufflers/exhaust silencers in necessary. Noise levels must comply with the relevant health & safety regulations and SANS codes and should be monitored by the Health & Safety Officer as necessary and appropriate, and all affected parties must be informed of the excessive noise factors.

The Contractor shall endeavour to keep noise generating activities to a minimum. The Contractor shall attempt 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. The Contractor shall be responsible for compliance with the relevant legislation with respect to noise. 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. Noise levels must comply with the SANS 100103 – 0994 (recommended noise levels).

All plant, equipment and vehicles are to have effective silencers/mufflers fitted that would otherwise cause a noise level exceeding 85dBI. Exhaust systems are to be in good repair with no holes in the

piping. Regular check-ups and adequately maintained must be undertaken to keep all equipment and vehicles in good working order to reduce noise. Excessively noisy equipment, vehicles or machinery requiring repairs are to be removed from site. No sound amplification equipment (hooters, loud music speakers, sirens etc.) is to be used on site except in emergencies.

7.14. Dust Management

Although the generation of dust is synonymous with construction sites, care needs to be taken to prevent excessive dust from impacting the surrounding environment and community. Majority of the dust causing activities will take place during the construction period. Exposed surfaces, such as stockpiles and cleared areas should be provided with a suitable cover as soon as possible or wetted down using non-potable water. Construction vehicles should maintain low speeds of 20-40km/h and must ensure that tarpaulins are used to cover any loads transported. Dust levels specified in the National Dust Control Regulations (GN 827 of November 2013) may not be exceeded, measured using reference method ASTM D1739.

A Complaints Register must be available at the site office for inspection by the ECO, in case of complaints, such as those related to dust. This should form a part of your Environmental Site File. The register shall contain all contact details of the person who made the complaint and information regarding the complaint itself as well as any follow-up undertaken, if required.

The Contractor shall submit a MS to the RE detailing how potential dust will be controlled. The contractor will consider the recommendations above while bearing in mind that these are not the only available solutions.

7.15. Site Closure and Rehabilitation

Upon completion of the construction phase, all disturbed areas, including the working area, temporary access road, and all areas utilised for the site camp and associated site camp facilities, if applicable, will require rehabilitation as follows:

- On completion of the construction activities, the site camp area must be cleared of all site camp facilities, ablution facilities, fencing, signage, waste and surplus material.
- All areas within the working area and site camp that have become devoid of vegetation or where soils have been compacted due to construction activities must be scarified or ripped to improve filtration and reduce run-off.
- All demarcation fencing, including all droppers, wires, netting and barrier tape must be removed from site and taken to an appropriate site for re-use or disposal.
- Surfaces must be checked for waste products from activities such as concreting or asphalting and cleared in a manner approved by the ECO. Any soil contaminated with hydrocarbons (oil, fuel, etc) or other hazardous substance must be collected and disposed of as hazardous waste at a licenced disposal facility.
- All construction waste is to be removed from the site and disposed of at an appropriate facility. Burying or burning of waste or rubble on site is strictly prohibited.
- Topsoil removed and stockpiled before construction, must be replaced by spreading it evenly over the areas from which it was removed. This topsoil (and the seedbank it contains) will facilitate the re-vegetation of the site.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the RE may require that the soil be analysed and any deleterious effects on the soil arising from the activity, be corrected and the area be seeded with a vegetation seed mix to his or her satisfaction. This *must* be done in consultation with the ECO.

- Disturbed areas, especially areas where excavations have taken place, must be shaped as appropriate (original topography must be restored where possible), and covered with a layer of stockpiled topsoil as soon as possible.
- Any topsoil, subsoil or other excavated material that cannot be utilised during site rehabilitation must be removed from the site and disposed of at an appropriate disposal site.
- The disturbed, newly rehabilitated surfaces (particularly steeper slopes and areas recently covered with topsoil) must be protected from wind & water erosion using mulch, brush packing or other appropriate erosion protection measures. Brush-packing/mulching is done by covering the exposed surface with organic plant material such as branches, plant cuttings and leafy material. Ideally the vegetation removed from site at the start of the construction must be utilised. Brush-packing/mulching plays a valuable role in erosion control, while also promoting re-vegetation of the site by retaining moisture in the soil, introducing seeds and/or trapping wind-blown seeds and providing organic material (compost) to promote new plant growth.
- Final landscaping and rehabilitation of the site must be done to the satisfaction of the ECO and must adhere to all conditions/requirements of the Environmental Authorisation.

7.16. Temporary Site Closure (Contractor's break)

It is the obligation of the Contractors to uphold and manage the anticipated impacts of vacancy of the site during this time. Therefore, the following management measures toward ensuring minimum impacts must be implemented prior to any temporary site closures during the construction phase:

- Any contaminated soil must be collected and disposed of as hazardous waste.
- All construction waste, litter and rubble must be removed from the site and re-used elsewhere, or recycled/disposed of at an appropriate facility. Burying or burning of waste or rubble on site is prohibited.
- Temporary access routes must be closed and measures put in place to prevent future use of the access road by any person.
- Preventative dust pollution mitigation measures must be implemented to control dust during the festive break (when the site is vacant).
- All construction areas/facilities must be secured, e.g. Where scaffolding is left on site, it must be ensured that no plastics, danger tape or other wastes are allowed to blow off; portable toilets must be secured etc.
- All construction barriers must be neat and secure.
- Stockpiles of topsoil, spoil material and other material that may generate dust must be protected from wind erosion (e.g. covered with netting, tarpaulin or other appropriate measures. Note that topsoil should not be covered with tarpaulin as this may kill the seedbank).
- Drip trays must be placed beneath all construction vehicles, if kept on site during the construction break. Drip trays must be placed under generators (if used on site) water pumps and any other machinery on site that utilises fuel/ lubricant.
- Where feasible, fuel tanks should be elevated so that leaks are easily detected.
- Contractors must ensure that their site camp and working areas are clear of alien invasive and weed species prior to the construction break.

8. ENVIRONMENTAL IMPACT MANAGEMENT: PLANNING AND DESIGN PHASE

No direct environmental impacts are associated with the planning and design phase. However, poor planning or inappropriate design decisions in this phase may result in environmental impacts arising during subsequent phases of the project.

Planning and design activities must therefore take into account the environmental constraints and opportunities identified during the Environmental Impact Assessment process, in order to avoid or minimise the potential future impacts of the development. Proper planning is also essential to ensure that adequate provision is made to implement the environmental requirements of this EMPr, and to ensure that the development is compliant with additional conditions which may be included in the Environmental Authorisation.

The environmental management objectives (goals) during this phase are to:

- Appoint an Independent Environmental Control Officer.
- Compile and adopt a suitable and acceptable Stormwater Management Plan.
- Update the EMPr (if necessary).

These environmental management objectives, as well as the management actions that must be implemented in order to achieve the desired objective and avoid/minimise potential impacts are discussed in more detail below.

8.1. Objective 1: Appointment of an Environmental Control Officer and Environmental Auditor

Impact Management Objective: ***To appoint a suitably qualified and experienced environmental control officer, environmental auditor.***			
Potential impact to avoid	Failure to appoint an ECO, and should it be required in terms of the Environmental Authorisation, an Environmental Auditor, and Environmental Auditor will result in non-compliance with the requirements of the EMPr.		
Impact Management Outcome	The requirements of the EMPr are implemented and monitored during all phases of the project, which will promote sound environmental management on site.		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
Environmental Auditor & Control Officer: • Should it be required in terms of the Environmental Authorisation (EA), a suitable qualified and experienced Environmental Auditor must be appointed as per the applicable timeframes. • A suitably qualified and experienced Environmental Control Officer (ECO) must be appointed before any activities commence on site. • The appointed ECO must adhere to the requirements stated in Section 11 of this EMPr. • The appointed ECO must be advised of the construction start date, at least **two** weeks in advance, prior to the commencement of any construction activities on site, so that the ECO can perform a pre-commencement inspection, ensure any pre-construction conditions of the environmental authorisation are completed, and plan for environmental awareness training of construction workers (see Section 14 for Environmental Awareness Plan and Appendix I for Environmental Awareness Training Booklet).		Krans Development (Pty) Ltd	During design phase
Performance Indicator	• A qualified ECO (should it be required in terms of the EA) is appointed prior to the commencement of any construction activities (including pre-construction set-up activities) on site. • A qualified auditor is appointed in line with the required auditing timeframes.		

8.2. Objective 2: Legislative compliance

Impact Management Objective: ***Legislative compliance***		
Potential impact to avoid	Commencement of activities without all relevant permits/permissions/licences/approvals including registered servitudes, permits to remove specific vegetation, etc. as well as commencing without implementation of specialist recommendations, and compliance with EMPr pre-construction activities, can result in penalties, time delays and excessive costs. All stemming from poor planning.	
Impact Management Outcome	All permits, permissions, licences, approvals, and specialist input are acquired, and the project is compliant with the respective conditions.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period

General
• Ensure all relevant permits/licenses/approvals are in place and are valid prior to commencing with works. These include, but are not limited to:
  o Environmental Authorisation;
  o Permits to be Obtained from Cape Nature for the clearance of Indigenous vegetation, if applicable; and
  o Water Use Authorisation
• Ensure that the Contractor has accepted the approved EMPr and Environmental Authorisation (and any other relevant permits/licenses/authorisations), as a part of their Tender Document, to ensure that they are fully aware of their responsibilities in terms of the implementation of these documents.
• Ensure that the Contractor has provided method statements for activities intended to be undertaken, and these are checked and approved by the ECO as well as the Engineer.
• Inform the ECO of planned works ahead, so as to ensure inductions are undertaken timeously.
• Involve ECO in selection of site camp location.
• Ensure that a site layout plan is received, this plan must indicate the total clearance areas, site camp.
• Ensure that the construction programme is pre-planned.
• The management measures listed in Section 6.18 must be implemented during temporary site closures and, depending on the construction period, the necessary provisions must be made to ensure the measures can be implemented accordingly.
 	
Climate Change Considerations:
• Final designs must include:
  - Green building materials must be integrated into the development as much as possible.
  - Apply soft engineering techniques, where possible.
  - Take into consideration floodline/drainage areas that can be exacerbated during flooding/storm surge events.
  - Incorporate thermal efficiency into designs and use climate-resilient technologies.
	Krans Development (Pty) Ltd	During design phase

- Water saving technologies/techniques (jo-jo tanks for rainwater collection) and energy saving technologies/techniques (solar geezers/solar panels on roofs, potentially in for light poles, etc. and utilizing energy saving bulbs where possible). - An appropriate stormwater management plan must be compiled and approved. - Ensure materials are sourced locally, and consider Life Cycle of all materials utilized, when selecting materials.		
Performance Indicator	The project does not incur delays, excessive costs and penalties due to unobtained permits and non-compliance with required permits, permissions, licences, and approvals.	

9. ENVIRONMENTAL IMPACT MANAGEMENT: PRE-CONSTRUCTION PHASE

Proper set-up during the pre-construction phase can set the foundation for good environmental management during the active construction phase to follow and can avoid potential impacts from arising at a later date.

The Impact Management Objectives for this phase of the project relate to:

- Identification and Demarcation of no-go areas and working areas.
- Establishment of site camp and associated site facilities.
- Pre-construction ECO visit.

9.1. Objective 1: Identify & demarcate no-go and working areas

Impact Management Objective: ***Demarcation of no-go and working areas.***		
Potential impact to avoid	• Insensitive location of working areas and site facilities may result in environmental impacts during the construction phase. • Failure to accurately demarcate working areas may result in works exceeding the approved assessed footprint, resulting in non-compliance and potential penalties and delays.	
Impact Management Outcome	• Future construction activities will be restricted to within the designated areas & all areas indicated as no-go areas, will be protected from disturbance. • Excavating into potentially fossil-bearing deposits during the pre-construction phase might damage some fossils	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
General: • Inform the ECO of planned works ahead, so as to ensure inductions are undertaken timeously. • Involve the ECO in selection of site camp location. • Ensure all labour and sub-contractors undergo environmental inductions. • Ensure that search and recue of plant species (orchids) be undertaken prior to the commencement of activities on site. The relocation of the orchids must be done in line with the management plan included as part of Appendix K of this EMPr. • Environmental Awareness and Training – Ensure all labour are informed and plant operators are aware of risks, issues, dos and don'ts within the project areas. • Ensure the relevant ECO is present and consulted for demarcation of the sensitive areas within the project footprint • Demarcate the working corridor with temporary fencing (e.g. poles and shade cloth) to obstruct visual impacts; • The temporary demarcations must be retained and maintained on a daily basis for the duration of the construction period in any one area. • Contain disturbance to the demarcated construction area at any one time. • Areas outside the proposed development footprint described in the EMPr must be considered no-go areas. **Road users:** • A detailed construction phase Traffic Management Plan must be compiled by the appointed contractor and submitted for approval to the RE and the ECO.	Environmental Control Officer (ECO), Contractor, Krans Development (Pty) Ltd	Pre-construction phase (prior to arrival of construction equipment, machinery, or workers on site)

Performance Indicator	No-go areas, working areas and areas for site camp facilities have been identified and appropriately demarcated to the satisfaction of the ECO, before construction activities commences on site. No fossils have been disturbed.

9.2. Objective 2: Establish Environmentally Sensitive Site Camp & Site Facilities

Impact Management Objective: ***To set up and equip the site camp and associated site facilities in a manner that will promote good environmental management.***		
Potential impact to avoid	• Failure to properly demarcate and set up site facilities may result in disorganised construction activities and unnecessary disturbance to the site. • Failure to provide the necessary site facilities and/or failure to equip these facilities with the necessary equipment/materials may impede good environmental management & compromise ability to respond to emergencies.	
Impact Management Outcome	Site camp facilities do not impact significantly on environment. The equipment required to implement the provisions of the EMPr are provided on site.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
General: • The site camp and associated site facilities must be set-up and managed in accordance with the general environmental management measures specified in Section 6.4 of this EMPr. • The site camp must be strategically set up in a manner that will promote good environmental management during construction/ demolition, and to respond to potential emergencies (including fires, spillage of hazardous substances etc.) that may arise. • The site camp, storage facilities, stockpiles, waste bins, and any other temporary structures on site must be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. • Frequent stormwater outlets must be maintained (if necessary), to prevent erosion at discharge points. • A sweep of the proposed development footprint must be done prior to the site establishment in order to ensure that no animals are hurt during site clearance activities. • A sweep of faunal species must be done by the Contractor, prior to the clearance of vegetation in any one area. • 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 on compliance to the ER and ECO prior to the temporary shutdown date ○	Contractor / Krans Development (Pty) Ltd / ECO	Pre-construction phase (prior to start of construction activities)
Performance Indicator	Appropriate, well organised, and properly equipped site facilities are available on site prior to commencement of construction activities. The location and set up of the facilities don't impact on the natural resources.	

9.3. Objective 3: Pre-Construction ECO and Environmental Site Officer (ESO) Inspection and Due Diligence

It is essential that the appointed ECO and ESO be advised of the intended construction start date before construction activities commence on site, in order for the ECO to conduct an initial site inspection to assess the pre-commencement condition of the site. The ECO can also advise on the appropriate siting and demarcation of the site facilities, and the identification and demarcation of the no-go areas. The ECO may also conduct the first round of environmental awareness training at this stage, if any construction workers/sub-contractors are present on site.

Impact Management Objective: ***Environmental Control Officer and Environmental Site Officer to conduct an inspection prior to the commencement of construction activities on site.***		
Potential impact to avoid	• Failure to appoint ECO or to notify ECO of commencement prior to commencement may result in non-compliance with the EA. • If a pre-commencement ECO inspection is not performed, the Construction Contractor may be held liable for environmental degradation that took place prior to the Contractor commencing work on site.	
Impact Management Outcome	• Good environmental management is promoted and enforced by the ECO during the full pre-construction and construction phases. • Site facilities are appropriately located on site. • Construction workers receive environmental awareness training before commencing work on site.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• The appointed ECO must be advised of the construction start date, before any activities commence on site so that the ECO can perform a pre-commencement inspection and plan for environmental awareness training (see Section 14 and Appendix I), of construction workers. • The ECO must ensure all relevant items are in place in terms of Section 7 and 8 of this EMPr, where necessary, and all relevant pre-construction requirements have been complied with in terms of the EA. • Ensure the project timeframe has taken the relevant requirements of the EA and EMPr, into account. • The ECO must take photographs of the site prior to the establishment of ALL facilities (including the site camp), for record purposes. • The ECO is to ensure that the Contractor has the Environmental File in place on site, with all the relevant content, and emergency numbers for the relevant authorities are available. • The ECO is to consult with the Contractor regarding relevant dates for environmental inductions (with regard to new labour). • If it is recommended that an SEO is appointed.	Contractor/ ECO	Start of construction phase
Performance Indicator	A pre-commencement site inspection is conducted by the appointed ECO before construction activities commence on site.	

10. ENVIRONMENTAL IMPACT MANAGEMENT: CONSTRUCTION PHASE

A number of potential environmental impacts may arise during the construction phase of the development. These impacts have been identified and assessed during the Environmental Impact Assessment process. Environmental Management objectives and actions that will prevent the identified potential impacts from arising – or where avoidance is not possible, that will minimise and mitigate the impacts – are provided in this section.

The environmental management actions and mitigation measures prescribed in this section must be implemented throughout the construction phase and must be implemented in conjunction with the general management measures specified in Section 6 of this EMPr, as well as any other conditions which may be stated in the Environmental Authorisation. The Environmental Control Officer must monitor and enforce the implementation of the relevant environmental management measures and may provide guidance on the implementation of these environmental management measures as and when required.

The environmental management objectives (goals) for the Construction phase are:

- Erosion, Earthworks and Land clearance
- Loss of vegetation and disruption to ecological processes
- Disturbance and displacement of faunal habitat and faunal species of conservation concern
- Management of the loss and impacts on the freshwater resources
- Management of socio-economic impacts
- Groundwater, surface water and soil contamination control
- Traffic impacts Control
- Air Quality Impact Control
- Noise and Visual Impact Control

The environmental management actions that must be implemented in order to achieve the desired objectives and avoid/minimise potential impacts are discussed in more detail in the sections below.

10.1. Objective 1: Erosion, Earthworks and Land Clearance

Impact Management Objective: ***Erosion, Earthworks and Land Clearance***		
Potential impact(s) to avoid	Susceptibility of some areas to erosion because of construction related disturbances due to the clearance of vegetation cover and soil disturbance may result in some areas being susceptible to soil erosion, during heavy rainfall events, after completion of the activity. Stockpiled soils and materials can be displaced in heavy rainfall and windy conditions, resulting in sediment dispersal. Likely loss of heritage material findings, such as the discovery of fossil deposits, during excavation and trenching.	
Impact Management Outcome	Manage Erosion, Earthworks and Land Clearance	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
General: • Monitoring for and removal of weeds, invasive aliens and other non-desirable vegetation must take place regularly, as once alien, or weedy seedlings are established, their control will become more difficult. • Be mindful of rainfall events, and plan construction works during dry season. • Ensure programme of works includes rehabilitation after each section has been backfilled, to avoid bare surfaces remaining exposed for extended periods of time. • Ensure all works on site, remain within the proposed development area identified in this EMPr (this includes stockpiling, if necessary, on site). **Stockpiling:** • Ensure stockpiles do not exceed 2m in height. • Prohibit stockpiling of material close to slopes. • Separate topsoil and subsoils during excavations. • When backfilling, ensure subsoils are backfilled first, and top-soil thereafter. • If topsoil is of poor-quality purchase new topsoil to ensure rehabilitation will be successful. • Remove alien invasives/weeds established on stockpiled soils prior to re-instatement. • Continue with weed management throughout construction, in line with the EMPr. **Excavations & Exposed surfaces:** • Please refer to Section 7 of the EMPr. **Alien invasive management:** • Please refer to Section 7.7 of the EMPr.	Contractor/ECO	Construction phase

Erosion Management • Please refer to Section 7.10 **Soil Aspects:** • Sufficient topsoil must be stored for later use during decommissioning, particularly from outcrop areas. • Topsoil shall be removed from all areas where physical disturbance of the surface will occur. • All available topsoil shall be removed after consultation with the botanist and horticulturalist prior to commencement of any operations. • The removed topsoil shall be stored on high ground within the site footprint. • Topsoil shall be kept separate from overburden and shall not be used for building or maintenance of roads. • The stockpiled topsoil shall be protected from being blown away or being eroded. The application of a suitable grass seed/runner mix will facilitate this and reduce the minimise weeds. **Stormwater and Erosion Control** • Stormwater Management Plans must be developed in accordance with Section 7.11 of the EMPr. **Specialist recommendations:** • A stormwater management plan must be developed in the preconstruction phase, detailing the stormwater structures and management interventions that must be installed to manage the increase of surface water flows directly into any natural systems. The stormwater management infrastructure must be designed to ensure the runoff from the development is not contaminated before entering the surrounding area. The volume and velocity of water must be reduced through discharging the surface flow at multiple locations surrounding the development. Effective stormwater management must include effective stabilisation of exposed soil. • Sedimentation must be minimised with appropriate measures. Any construction causing bare slopes and surfaces to be exposed to the elements must include measures to protect against erosion using covers, silt fences, sandbags, earthen berms etc. • All stockpiles must be protected and located in flat areas where run-off will be minimised and sediment recoverable • Construction must have contingency plans for high rainfall events during construction. Even in the operational phase, measures to contain impacts caused during high rainfall events must be planned for and available for use. • The buffer area must be maintained through alien invasive plant species removal (which is the landowner's responsibility regardless of mitigation associated with this project) and the establishment of indigenous vegetation cover to filter run-off before it enters the aquatic habitat. • Stormwater infrastructure must be inspected at least once every year (before the onset of rains) to ensure that it is working efficiently. Any evidence of erosion from this stormwater system must be rehabilitated and the volume/velocity of the water reduced through further structures and/or energy dissipaters **Palaeontology and Heritage Specialists recommendations:** • Implement Chance Finds Procedure such that isolated fossils can be collected during development and safeguarded for future research.		
Performance Indicator	No soil and / or groundwater contamination incidences and potential fossil find disturbed	

10.2. Objective 2: Loss of vegetation and disruption to ecological processes

***Impact Management Objective:* Reduce the impacts caused by land disturbance and impacts on surrounding indigenous vegetation.**		
Potential impact(s) to avoid	Prevention of vegetation loss immediately outside the development site/ no-go areas	
Impact Management Outcome	The disturbance of indigenous vegetation and faunal species is minimised.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
General: • Demarcate the construction site boundaries upon site establishment and limit all activities to inside these boundaries. • The species and ecological corridor management plan (Appendix M) must be implemented on site prior to the commencement of construction activities. **Clearance of vegetation:** • Limit the footprint area of the construction activity to the immediate site. • Designate areas outside the approved project footprint as highlighted in Section 6.3 of this EMPr. as No-Go areas. • Contractors must drive on existing access roads as far as possible to prevent formation of unnecessary tracks for access roads. • Prohibit temporary storage of building material or soil within areas of natural vegetation falling outside of the construction footprint. • Remove all alien and weed species encountered within areas disturbed by construction activities. Removal of species should take place throughout the construction and operational phases of the development. • Rehabilitate the development footprint and areas disturbed during construction with species indigenous to the vegetation type during the decommissioning phase of the development. • Blanket clearing of vegetation must be limited to the development footprint, and the area to be cleared must be demarcated before any clearing commences. • No clearing outside of footprint to take place. • Such measures include a survey of the route before commencement in order to microsite the route to avoid large or important fynbos species and may require hand excavation in certain areas to reduce the footprint so as not to significantly disturbance. • Topsoil must be striped and stockpiled separately during site preparation and replaced on completion where revegetation will take place. • Any site camps and laydown areas requiring clearing must be located within already disturbed areas. • Blanket clearing of vegetation must be limited to the approved development footprint, and the area to be cleared must be demarcated before any clearing and grubbing commences. • No clearing outside of development and infrastructure footprint area to take place. • Open Space to be incorporated in final plan to include ecological corridors.	Contractor/ Krans Development (Pty) Ltd	Construction phase

• Topsoil must be striped and stockpiled separately during site preparation and replaced on completion where revegetation will take place. • Any site camps and laydown areas requiring clearing must be located within already disturbed areas away from watercourses. • A search and rescue plan must be implemented prior to the commencement of the construction phase of the proposed development. Should species of conservation concern be found within the site boundaries at this time, an experienced botanist must be appointed to identified practicable rescue operations aimed toward the success of the species as appropriate. • Respective permits to be obtained beforehand. • Removed topsoil should be used in rehabilitation of transformed areas that are within the open space areas. **Fires** • The Contractor must ensure that an emergency preparedness plan is in place in order to fight accidental fires or veld fires, should they occur. The adjacent landowners/users/managers should also be informed or otherwise involved. • Enclosed areas for food preparation should be provided and the Contractor must strictly prohibit the use of open fires for cooking and heating purposes. • The use of branches of trees and shrubs for fire-making must be strictly prohibited. • The Contractor should take all reasonable and active steps to avoid increasing the risk of fire through their activities on-site. No fires may be lit except at places approved by the ECO. • The Contractor must ensure that the basic fire-fighting equipment is to the satisfaction of the Local Emergency Services. • The Contractor must supply all living quarters, site offices, kitchen areas, workshop areas, materials, stores and any other relevant areas with tested and approved fire-fighting equipment. • Fires and "hot work" must be restricted to demarcated areas. **Soil Aspects** • Sufficient topsoil must be stored for later use during decommissioning, particularly from outcrop areas. • Topsoil shall be removed from all areas where physical disturbance of the surface will occur. • All available topsoil shall be removed after consultation with the botanist and horticulturalist prior to commencement of any operations. • The removed topsoil shall be stored on high ground within the footprint of the proposed development footprint. • Topsoils shall be kept separate from overburden and shall not be used for building or maintenance of roads. • The stockpiled topsoil shall be protected from being blown away or being eroded. The application of a suitable grass seed/runner mix will facilitate this and reduce the minimise weeds.		
Performance Indicator	Construction team limit disturbance to the surrounding vegetation.	

10.3. Objective 3: Disturbance and displacement of Faunal habitat and faunal species of conservation concern

Impact Management Objective: ***Reduce the impacts caused by land disturbance and impacts on the faunal habitat and faunal species of conservation concern***			
Potential impact(s) to avoid	• Permanent loss of faunal habitat cover due to construction activities. • Disturbance and displacement of faunal species, their processes.		
Impact Management Outcome	The disturbance of faunal habitat and faunal species is minimised.		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
General: • The species and ecological corridor management plan (Appendix M) must be implemented on site prior to the commencement of construction activities. • Ensure contact numbers for emergency assistance is available. • Reptiles such as lizards are less mobile compared to mammals, and some mortalities could arise. • Should vegetation regrowth be significant prior to the commencement of the construction phase of the proposed development, it is recommended that a faunal search and rescue be conducted before construction commences, although experience has shown that there could still be some mortalities as these species are mobile and may thus move onto site once construction is underway. • A reptile handler should be on call for such circumstances. • No animals are to be harmed or killed during the course of operations. • It is important that clearing activities are kept to the minimum and take place in a phased manner. This allows animal species to move into safe areas and prevents wind and water erosion of the cleared areas. • Workers are NOT allowed to collect any flora or snare any faunal species. All flora and fauna remain the property of the landowner and must not be disturbed, upset or used without their expressed consent. • Trees and shrubs that are directly affected by the operations may be felled or cleared but only by the expressed written permission of the ECO. • Should animals wander onto site, the animals must be captured and released into the adjoining nature reserve grounds. • The site is to be always kept clean and tidy so as to not attract the animals to the site. • Open Space to be incorporated in final plan to include ecological corridors. • A search and rescue plan must be implemented prior to the commencement of the construction phase of the proposed development. Should species of conservation concern be found within the site boundaries at this time, an experienced botanist must be appointed to identified practicable rescue operations aimed toward the success of the species as appropriate. • Respective permits to be obtained beforehand.		Contractor	Construction phase

Specialist recommendations: • The Non-indigenous forest and Non-perennial stream / Wetland habitats (all habitats which are retrieved as "High" SEI) be excluded from any development planning (i.e., avoidance mitigation). Currently, these "No-Go" areas constitute the northern part of Portion 8. • Footprints must be kept at a minimum so as not to impinge on adjacent habitats in the landscape. • Every effort should be made to save and relocate any mammal, reptile, amphibian, bird, or invertebrate that cannot flee of its own accord, encountered during site preparation (i.e., to avoid and minimise the direct mortality of faunal species). These animals should be relocated to a suitable habitat area immediately outside the project footprint (in the adjoining natural habitats), but under no circumstance to an area further away. • It is recommended that pollution of the development footprint, as well as any areas adjacent to the footprint, be monitored and avoided during the construction phase. • Blanket clearing of vegetation must be limited to the approved development footprint, and the area to be cleared must be demarcated before any clearing commences.		
Performance Indicator	Construction team limit disturbance to the surrounding vegetation and faunal species.	

10.4. Objective 4: Loss of Agricultural Resources

<u>Impact Management Objective:</u> Reduce the impacts caused by land disturbance and impacts on the Agricultural Resources		
Potential impact(s) to avoid	• Loss of Agricultural Resources beyond the boundaries of the proposed development footprint.	
Impact Management Outcome	Minimisation of the impacts of the proposed development on the agricultural resources.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
<u>General</u>: • No activities are allowed beyond the boundaries of the approved development area. • No workers may be permitted to enter into areas beyond the demarcated boundaries of the construction footprint.	Contractor	Construction phase
Performance Indicator	Construction team limit disturbance to the agricultural resources within proximity to the proposed development area.	

10.5. Objective 5: Impacts on Freshwater resources

Impact Management Objective: ***Reduce the impacts caused by land disturbance and impacts on the Freshwater Resources***			
Potential impact(s) to avoid	• Damage to instream and riparian habitats of identified water resource as a direct result of construction activities. • Pollution of identified water resources as a direct result of contaminated runoff from construction areas. • Soil and Groundwater Contamination as a result of infiltration of construction-related pollutants. • Disturbance to aquatic and terrestrial fauna within the identified water resources as a result of construction activities.		
Impact Management Outcome	Minimisation of the impacts of the proposed development on the freshwater resources.		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
General: • Suitable measures must be implemented in areas that are susceptible to erosion. Areas must be rehabilitated, and a suitable cover crop planted once construction is completed. • Topsoil must be stripped and stockpiled separately and replaced on completion. • Be mindful of weather conditions that may cause runoff. • Utilize silt fences, if necessary, at demarcated working corridor fence line, to capture runoff. • If feasible, chemical toilets must be kept at the site camp. Chemical toilets must be placed on a level surface and secured from blowing over. • Toilets may not be linked to the storm water drainage system in any way. • Chemical toilets must be regularly emptied, and the waste disposed of at an appropriately registered waste water disposal/ treatment site. Care must be taken to prevent spillages when moving or servicing chemical toilets. • It must be ensured that all hazardous storage containers and storage areas comply with the relevant SANS codes to prevent leakage and contamination of surface and groundwater. • No fires should be permitted. • All construction vehicles must be regularly inspected for leaks. Refuelling must take place on a sealed surface area to prevent the ingress of hydrocarbons into the topsoil. • In the event of a vehicle breakdown, maintenance of vehicles must take place with care and the recollection of spillage should be practised near the surface area to prevent the ingress of hydrocarbons into the topsoil. • All spills should they occur should be immediately cleaned up and treated accordingly. • Sheet runoff from access roads should be slowed down by the strategic placement of silt traps in accordance with the approved Environmental Management Plan (EMP). • As far as feasibly possible, all construction activities within the watercoursesshould occur during the dry summer months (December – February). **Specialist recommendations:** • A construction method statement must be compiled and available on site. It must consider the buffer zone and include methods to avoid unnecessary disturbance and prevent material being washed downslope into the wetlands.		Contractor	Construction phase

• Any contractor found working within No-Go areas must be fined as per fining schedule/system setup for the project • It is the contractor's responsibility to continuously monitor the area for newly established alien species during the contract and establishment period, which if present must be removed. Removal of these species shall be undertaken in a way which prevents any damage to the remaining indigenous species and inhibits the re-infestation of the cleaned areas. Any use of herbicides in removing alien plant species is required to be investigated by the ECO before use. • Where vegetation has been cleared in the buffer and open ground in the riparian area has resulted (i.e. where indigenous vegetation has been replaced by dense alien plant infestations), it is recommended that cover components be reinstated appropriately. Only indigenous species are to be considered. • It is recommended that the wetland be fenced to prevent or at least discourage encroachment by humans and livestock. • The local authority should prevent illegal dumping in this area by providing suitable waste disposal facilities where waste can be recycled and disposed of in a controlled manner. • Engage with the community to explain the reasons why the buffer and the water resources are protected. This could be targeted at learners to prevent the dumping of solid waste and other activities that threaten the watercourses and buffer zones. • The community could be involved in the monitoring. • Placement of signage near the boundary of the buffer zone should also be considered to help mark the boundary and educate the community about the purpose and value of protecting buffer zones. Information can include a description and visual of alien invasive plant species. • A stormwater management plan must be developed in the preconstruction phase, detailing the stormwater structures and management interventions that must be installed to manage the changes to surface water flows. • When developing a stormwater management plan for the site, it will be critical that due consideration is given to the collection and treatment of stormwater prior to discharge into the natural environment. It is therefore recommended that the stormwater management plan be developed with appropriate ecological input and be developed based on Sustainable Drainage Systems (SUDS). The SUDS systems attempt to maintain or mimic the natural flow systems as well as prevent the wash-off of urban pollutants to receiving waters. • Soft infrastructure must be considered where practical. For example, permeable surfaces can be done via permeable concrete block pavers (such as Amorflex), brick pavers, stone chip, and gravel and may contribute to slowing surface flows (especially if maintained). Baffles in the stormwater conduits are effective. Stormwater managed by the development could be discharged into porous channels / swales ('infiltration channels or basins') running near parallel or parallel to contours within and along the edge of the development. This will provide for some filtration and removal of urban pollutants (e.g. oils and hydrocarbons), provide some attenuation by increasing the time runoff takes to reach low points, and reduce the energy of storm water flows within the stormwater system through increased roughness when compared with pipes and concrete V-drains. • The stormwater management infrastructure must be designed to ensure the runoff from the development is not highly contaminated or concentrated before entering the surrounding area. Any stormwater retention ponds or berms must be located outside of the buffer area. • The adoption of the 42m aquatic buffer zone between the development infrastructure and HGM1. • The volume and velocity of water must be reduced through discharging the surface flow at multiple locations surrounding the development.		

• Effective stormwater management must include effective stabilisation (gabions and Reno mattresses) of exposed soil. Contingency plans must be in place for high rainfall events which may occur during construction. • If flower/plant beds are to be established adjacent to hard surfaces, then these should be designed to receive storm water from hardened surfaces and should be planted with robust indigenous species that to contribute to storm water management objectives. • Storm water should be harvested onsite from roofed surfaces thus reducing the quantity (volume) of water received by downstream water resources.		
Performance Indicator	Construction team limit disturbance to the freshwater resources within proximity to the proposed development area.	

10.6. Objective 6: Impacts of Pollution on the environmental resources

Impact Management Objective: ***Reduce the impacts caused by pollution sources***		
Potential impact(s) to avoid	• Poor housekeeping could potentially lead to groundwater, freshwater and soil contamination.	
Impact Management Outcome	Minimisation of the impacts of the proposed development on the biophysical environment.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• **Pollution Management – Hazardous Substances** o Vehicles and machinery must be in good working order and must be regularly inspected for leaks. o If a vehicle or machinery is leaking pollutants it must, as soon as possible, be taken to an appropriate location for repair. The ECO has the authority to request that any vehicle or piece of equipment that is contaminating the environment be removed from the site until it has been satisfactorily repaired. o Repairs to vehicles/ machinery may take place on site, within a designated maintenance area at the site camp. Drip trays, tarpaulin or other impermeable layer must be laid down prior to undertaking repairs. o Refuelling of vehicles/ machinery may only take place at the site camp or vehicle maintenance yard. Where refuelling must occur, drip trays should be utilised to catch potential spills/ drips. o Drip trays must be utilised during decanting of hazardous substances and when refilling chemical/ fuel storage tanks. o Drip trays must be placed under generators (if used on site) water pumps and any other machinery on site that utilises fuel/ lubricant, or where there is risk of leakage/spillage. o Any hazardous substances (materials, fuels, other chemicals etc.) that may be required on site must be stored according to the manufacturers' product-storage requirements, which may include a covered, waterproof bunded housing structure. o Material Safety Data Sheets (MSDSs) must be readily available on site for all chemicals and hazardous substances to be used on site. Where possible and available, MSDSs should additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases.	Contractor	Construction phase

○ Hazardous chemicals and fuels should be stored on bunded, impermeable surfaces with sufficient capacity to hold at least 110% of the capacity of the storage tanks. ○ Where feasible, fuel tanks should be elevated so that leaks are easily detected. ○ A spill kit to neutralise/treat spills of fuel/ oil/ lubricants must be available on site, and workers must be educated on how to utilise the spill kit. ○ Soil contaminated by hazardous substances must be excavated and disposed of as hazardous waste. ○ If cement is to be mixed, ensure this is done on a bunded impermeable surface, and transferred so that there is no interaction with natural ground. ○ No contaminated soil may be utilized during backfilling. • **<u>Pollution Management – Cement handling</u>** ○ Cement batching must take place on an impermeable surface large enough to retain any slurry or cement water run-off. If necessary, plastic/ bidem lined detention ponds (or similar) should be constructed to catch the run-off from batching areas. Once the water content of the cement water/ slurry has evaporated the dried cement should be scraped out of the detention pond and disposed of at an appropriate disposal facility authorised to deal with such waste ○ Cement batching must take place on already transformed areas within the footprint of the facility. ○ Unused cement bags must be stored in such a way that they will be protected from rain. Empty cement bags must not be left lying on the ground and must be disposed of in the appropriate waste bin. ○ Washing of excess cement/concrete into the ground is not allowed. All excess concrete/ cement must be removed from site and disposed of at an appropriate location. • **<u>General Waste Management</u>** ○ Dedicated waste bins or skips must be provided on site and kept in a demarcated area on an impermeable surfaces. ○ Separate waste bins/skips must be provided for recyclable waste, general waste and hazardous waste. Recovered builder's rubble & green waste may be stockpiled on the ground within the site camp, or in separate skips until removal. ○ Waste must be placed in the appropriate waste bins/skips/ stockpiles. ○ Hazardous waste bins must be kept on an impermeable bunded surface capable of holding at least 110% of the volume of the bins. ○ Skips/ bins must be provided with secure lids or covering that will prevent scavenging and windblown waste or dust. ○ Waste bins/skips must be regularly emptied and must not be allowed to overflow. ○ Construction workers must be instructed not to litter and to place all waste in the appropriate waste bins provided on site. ○ The Contractor must ensure that all workers on site are familiar with the correct waste disposal procedures to be followed. ○ Waste generated on site must be classified and managed in accordance with the National Environmental Management: Waste Act – Waste Classification and Management Regulations (GN No. R. 634 of August 2013).		

○ Disposal of waste to landfill must be undertaken in accordance with the National Environmental Management: Waste Act – National Norms and Standard for the Assessment of Waste for Landfill Disposal (GN No. R. 635 of August 2013). ○ All waste, hazardous as well as general, which result from the proposed activities must be disposed of appropriately at a licensed Waste Disposal Facility (WDF).		
Performance Indicator	Housekeeping is in order in all working areas forming part of the proposed development.	

10.7. Objective 7: Impact on Socio-Economic Environment

***Impact Management Objective:* To create employment opportunities with potential for skills transfer, for members of the local community.**		
Potential impact(s) to be promoted.	• A number of temporary job opportunities for skilled and unskilled labour will be created during the construction phase of the development. • Potential transfer of skills from more experienced workers to less experienced workers. • Increase in business for local businesses within the construction industry.	
Impact Management Outcome	• Social benefits from the employment opportunities created during the construction phase. • Increased revenue for local businesses during the construction phase.	
IMPACT MANAGEMENT ACTIONS		
Promotion measure	Responsible party	Time period
General mitigations: • All mitigation measures proposed under the visual impacts above must be implemented on site. • All mitigation measures proposed under the traffic impacts above must be implemented on site. • An independent Community Liaison Officer (CLO) must be appointed by the Contractor/Developer to ensure that employment of local labour is fair. • The CLO must engage with the Ward Councillor prior to and during the construction works regarding the employment of local labourers. • If applicable, the CLO must engage with any business forums and/or community groups regarding the opportunities available on site. • Where applicable, Local SMME's should be approached and afforded with the opportunity to provide services to the construction works, • Where possible, local labourers must be used on site (should the skill sets allow for it). • If applicable, local labourers must be trained and provided with the possibility to obtain or improve skillsets which would be transferrable to future employment opportunities. **Safety and Security** • There must be a 24/7 security team on the proposed development site during the construction phase of the project.	Krans Development (Pty) Ltd / Contractor	Construction phase

• No local workers may access the proposed development area outside of the designated clock in times. • An attendance register must be available on site at all times. • All labourers must sign the attendance register upon entrance and exit of the workday. • Workers must be encouraged to wear distinguishable clothing in order for surrounding landowners to clearly identify workers associated with the proposed development site. • From the onset of the project, a notice must be placed at all entrances to the site that no 'Off the Street' opportunities are available.		
Performance Indicator	A substantial proportion of the construction team is from the local community, with preference given to historically disadvantaged individuals and, where appropriate, unskilled labourers. Skills transfer from experienced to less experienced workers is actively encouraged on site.	

10.8. Objective 8: Impact on Traffic regime in the area

Impact Management Objective: ***To minimise the impact of traffic disruptions to the local community and commuters of the N2-Highway.***		
Potential impact(s) to be promoted.	• Poor traffic management to disrupt the road network in the residential area associated with the Riversdale residential area.	
Impact Management Outcome	• Minimal traffic management complaints by the local community.	
IMPACT MANAGEMENT ACTIONS		
Promotion measure	Responsible party	Time period
General mitigations: • A traffic management plan must be compiled by the Contractor for the construction phase of the proposed development. • This management plan must be submitted to the Municipality for approval prior to the commencement of works. • Construction vehicles must remain on designated routes and only access points into the site, as permitted by the Contractor, may be used. • All construction vehicles must be in good working condition.	Krans Development (Pty) Ltd / Contractor	Construction phase
Performance Indicator	Minimal Traffic related incidents and negative feedback pertaining to the construction works associated with the proposed development.	

10.9. Objective 9: Air Quality Control

Impact Management Objective: ***Minimise the effect on air quality from dust and emissions complaints.***			
Potential impact(s) to be avoided.	• Generated dust from exposed soil, and ground disturbance. • Construction vehicles emitting exhaust fumes		
Impact Management Outcome	• Minimise the incidence of dust. • Minimised emission related complaints.		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
General: • Dust suppression methods, such as wetting with non-potable such water or laying must be used during the construction phase of the proposed development. • Stockpiles and spoil heaps must be covered to prevent fugitive dust. • All construction vehicles must be appropriately maintained to minimise exhaust Emissions. • All mitigation measures described in the EMPr relating to dust and vehicle emissions must be adhered to (Section 7.12 and 7.14 of the EMPr. • All spills or accidents involving such materials are to be recorded by the Contractor. • A phased vegetation clearance procedure must be encouraged. • During high wind conditions, the RE will evaluate the situation and make recommendations as to whether dust damping measures are adequate, or weather working will cease altogether until the wind speed drops to an acceptable level. • Exposed soil and material stockpiles shall be protected against wind erosion and the location of stockpiles shall take into consideration the prevailing wind directions and locations of sensitive receptors.		Contractor	Construction phase
Performance Indicator	No air quality complaints, good visibility and no fume complaints.		

10.10. Objective 10: Noise and Visual Impact Control

Impact Management Objective: ***Minimised noise complaints***			
Potential impact(s) to be avoided.	• Noise from construction vehicles and machinery. • Impacts on the Visual and Cultural Landscape		
Impact Management Outcome	• Avoid excessive noise and visual impacts due to construction activities		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
Noise • All construction vehicles must be fitted with silencers to avoid excessive noise. • All construction vehicles must be equipped with muffled reverse sirens (which are to the standard of the Occupational Health & Safety Act (Act 85 of 1993)). • No constructions activities are permitted between 17:00 and 7:00 unless previously agreed upon between the Contacting team and the Municipality. • Construction workers are to remain within the designated site boundary at all time. • Eating areas are to be located away from any residential units/homesteads and tourists' attractions within proximity to the current working areas. • All equipment to be adequately maintained and kept in good working order to reduce noise. • All employees must be given the necessary ear protection gear. • Noise levels must comply with the SANS 100103 – 0994 (recommended noise levels), as well as the Western Cape Noise Control Regulations (Provincial Notice 200/2013) of 20 June 2013. • All mitigation measures relating to noise control as described in the EMPr must be adhered to. **Visual** • A clean site policy must be adopted at all time during the construction phase. • Where possible, storage and disposal of waste must take place in a sustainable manner, where clearly marked recycle bins must be provided to workers at the site camp. • The visual impact experienced during the construction phase would be relatively short term and be mitigated by good housekeeping and regular removal of rubble on the site. • An approved EMPr must be adhered to in order to minimize the visual impacts of construction phase activities. • No stockpiles may exceed 2m in height.		Contractor/ ECO	Construction phase
Performance Indicator	No noise or visual impact complaints.		

11. ENVIRONMENTAL IMPACT MANAGEMENT: POST CONSTRUCTION REHABILITATION PHASE & OPERATIONAL PHASE

After all construction activities have ceased, the sites must be cleared of all construction related equipment, materials, facilities and waste. In addition, all disturbed surfaces – including disturbed areas around the structures and all areas utilised for site facilities – must be stabilised, rehabilitated and provided with a suitable cover. All temporary access roads constructed must be rehabilitated and access must be restricted from the public.

The environmental management objectives (goals) for this phase are:

- Alien invasive species clearance and site management
- Minimise impacts on Freshwater resources
- Visual Impact management

11.1. Objective 1: Alien invasive species clearance, rehabilitation and site management

***Impact Management Objective:* Alien invasive species controlled and reduced**		
Potential impact(s) to be avoided	• The spread of alien invasive species to other areas. • Increased fire risk • Potential loss to biodiversity • Environmental degradation from the change of vegetation structure and soil chemistry.	
Impact Management Outcome	Limited infestation and establishment of alien invasive species population and limit fire risks	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
General • An Emergency Response Plan must be in place for the site, this must clearly describe emergency procedures and include emergency contact numbers. • The corridor management plan included as Appendix M must be implanted on site. Alien invasive vegetation management • Spread of alien invasive vegetation associated with the soil disturbance caused by construction must be managed appropriately(Appendix G). • Following the conclusion of the installation activities in any one area, any disturbed areas must be rehabilitated by the Contractor, with suitable indigenous flora as soon as possible. The onus will rest on the EA Holder to ensure the prolonged success of the rehabilitation measures. • Removal of weedy or invasive plant material is to be done by hand and in accordance with applicable and recognised methods. No machinery may be used. • Areas that have been cleared must be considered for replanting with the locally indigenous species. Clearing must take place before invasive alien plants flower and set seed. All cleared material is to be removed from site to a suitable refuse facility. • If herbicides are to be used, only registered herbicides are to be used. • All equipment must be suited to the task at hand and be in good working order.	Developer / Krans Development (Pty) Ltd / Contractor	• Operational phase

• Herbicide application must be done in such a way as to prevent over-spray and spray drift. Herbicide application should not be undertaken during windy conditions. • No water may be collected from any natural sources for mixing of herbicide or cleaning of equipment. • Alien invasive vegetation management around the site is to take place in accordance with the Alien Vegetation Management Programme provided in the Environmental Management Programme (Appendix G). **Fires:** • Operational Fire extinguishers must be present on site. • During construction and post-construction activities no uncontrolled fires are allowed. • Ensure emergency numbers are readily available with a working phone on site. **Faunal specialist** • The Non-indigenous forest and Non-perennial stream / Wetland habitats (all habitats which are retrieved as "High" SEI) be excluded from any development planning (i.e., avoidance mitigation). Currently, these "No-Go" areas constitute the northern part of Portion 8. • Construction / Rehabilitation team only: Footprints must be kept at a minimum so as not to impinge on adjacent habitats in the landscape. • Every effort should be made to save and relocate any mammal, reptile, amphibian, bird, or invertebrate that cannot flee of its own accord, encountered during site preparation (i.e., to avoid and minimise the direct mortality of faunal species). These animals should be relocated to a suitable habitat area immediately outside the project footprint (in the adjoining natural habitats), but under no circumstance to an area further away. • Construction / Rehabilitation team only: It is recommended that pollution of the development footprint, as well as any areas adjacent to the footprint, be monitored and avoided during the construction phase. • Open Space to be incorporated in final plan to include ecological corridors and riparian zones. • Open Space rehabilitation and removal of invasives should commence before site clearing commences.		
Performance Indicator	Limited alien species, protected indigenous vegetation, limit fire risks.	

11.2. Objective 2: Impacts on Freshwater resources

Impact Management Objective: ***Reduce the impacts caused by land disturbance and impacts on the Freshwater Resources***		
Potential impact(s) to avoid	• Damage to instream and riparian habitats of identified water resource as a direct result of construction activities. • Pollution of identified water resources as a direct result of contaminated runoff from construction areas. • Soil and Groundwater Contamination as a result of infiltration of construction-related pollutants. • Disturbance to aquatic and terrestrial fauna within the identified water resources as a result of construction activities.	
Impact Management Outcome	Minimisation of the impacts of the proposed development on the freshwater resources.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period

Specialist mitigation measures: • A construction method statement must be compiled and available on site. It must consider the buffer zone and include methods to avoid unnecessary disturbance and prevent material being washed downslope into the wetlands. • Any contractor found working within No-Go areas must be fined as per fining schedule/system setup for the project • It is the contractor's responsibility to continuously monitor the area for newly established alien species during the contract and establishment period, which if present must be removed. Removal of these species shall be undertaken in a way which prevents any damage to the remaining indigenous species and inhibits the re-infestation of the cleaned areas. Any use of herbicides in removing alien plant species is required to be investigated by the ECO before use. • Where vegetation has been cleared in the buffer and open ground in the riparian area has resulted (i.e. where indigenous vegetation has been replaced by dense alien plant infestations), it is recommended that cover components be reinstated appropriately. Only indigenous species are to be considered. • It is recommended that the wetland be fenced to prevent or at least discourage encroachment by humans and livestock. • The local authority should prevent illegal dumping in this area by providing suitable waste disposal facilities where waste can be recycled and disposed of in a controlled manner. • Engage with the community to explain the reasons why the buffer and the water resources are protected. This could be targeted at learners to prevent the dumping of solid waste and other activities that threaten the watercourses and buffer zones. • The community could be involved in the monitoring. • Placement of signage near the boundary of the buffer zone should also be considered to help mark the boundary and educate the community about the purpose and value of protecting buffer zones. Information can include a description and visual of alien invasive plant species. • A stormwater management plan developed in the preconstruction phase must be implemented. • The stormwater management infrastructure must be designed to ensure the runoff from the development is not highly contaminated or concentrated before entering the surrounding area. Any stormwater retention ponds or berms must be located outside of the buffer area. • The adoption of the 42m aquatic buffer zone between the development infrastructure and HGM1. • The volume and velocity of water must be reduced through discharging the surface flow at multiple locations surrounding the development. • Effective stormwater management must include effective stabilisation (gabions and Reno mattresses) of exposed soil. Contingency plans must be in place for high rainfall events which may occur during construction. • If flower/plant beds are to be established adjacent to hard surfaces, then these should be designed to receive storm water from hardened surfaces and should be planted with robust indigenous species that to contribute to storm water management objectives. • Storm water should be harvested onsite from roofed surfaces thus reducing the quantity (volume) of water received by downstream water resources as surface flow • The project will need to comply with all regulations of the National Water Act (Act 36 of 1998), including the protection of downstream users, and minimise any potential ecological impacts upon water resources.	Contractor	Construction phase

Performance Indicator	Construction team limit disturbance to the freshwater resources within proximity to the proposed development area.

11.3. Objective 3: Visual impact

***Impact Management Objective:* Visual Impact**		
Potential impact(s) to be avoided.	Unsightly views of the clearance activities associated with the project due to delayed revegetation and rehabilitation.	
Impact Management Outcome	• No unnecessary disturbance to the view.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
General: • Rehabilitate the area where the clearance and installation activities may have impacted. • Follow the rehabilitation plan and ensure that all alien invasives are cleared and indigenous cover is successful. • Re-vegetation and landscaping with plant species indigenous to the surrounding indigenous cover must be undertaken, where possible. • The Applicant must ensure that the vegetation is reinstated and monitor vegetation growth to ensure regrowth until its fully established.	Developer / Krans Development (Pty) Ltd	Operational phase
Performance Indicator	• Minimal visual impact as a result of the presence of the proposed development.	

12. MONITORING COMPLIANCE, ROLES AND RESPONSIBILITIES

This EMPr, once approved by the competent authority (DEADP), must be seen as binding to the *Holder*, and any person acting on the *Holder's* behalf, including but not limited to agents, employees, associates, contractors and service providers.

The *Holder* and all other persons who may be directly involved in the development are also bound by their general Duty of Care, as stated in Section 28 of the National Environmental Management Act, 1998:

> ***Duty of Care:***
> *"Every person who causes, has caused, or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm cannot reasonably be avoided or stopped, to minimize and rectify such pollution or degradation of the environment"*

12.1. Environmental Authorisation (EA) *Holder* / Proponent

It is the EA *Holder's* responsibility to ensure that all agents/contractors/subconsultants appointed to provide services towards the fulfilment of the proposed activities, are fully aware of the EMPr, Environmental Authorisation and any other relevant licenses/permits, which must be considered prior to actioning any activity on site. The EA *Holder* may choose to hold the Contractor responsible for any fines incurred as a result of non-compliant activities during implementation, however this must be done through the agent and by legal procedure. The EA *Holder* must ensure that:

- Financial allowances are incorporated into the Bill of Quantities, to accommodate for the requirements of the licenses and EMPr.
- An appropriately experienced/qualified Environmental Control Officer (ECO) is appointed to monitor compliance, prior to commencement of site establishment activities.
- Should the granted EA stipulate the need for the appointment of an Environmental Auditor, ensure an appropriated experienced/qualified Environmental Auditor is appointed to audit compliance, prior to commencement of site establishment activities.

The *Holder* is ultimately responsible for ensuring that the environmental management measures specified in this EMPr, as well as any other conditions specified by the competent authority, are implemented and adhered to during the construction and post-construction phase (maintenance activities) of the proposed development.

The *Holder* or delegated party is responsible for monitoring and maintenance during the post-construction phase. The *Holder* must ensure that all appointed service providers, contractors and maintenance workers are capable of complying with all statutory requirements of this EMPr and the conditions of the Environmental Authorisation. The *Holder* is responsible for ensuring that this EMPr and the conditions of the Environmental Authorisation are implemented and adhered to during construction.

The *Holder* or appointed consultant is responsible for identifying emergency situations that may arise during operational and maintenance activities and must formulate appropriate emergency response procedures for these emergency scenarios.

During the post-construction and maintenance phase of the project the following maintenance measures are to be implemented in order to ensure the functioning of the infrastructure when needed:

- A monitoring register is to be upheld by the EA *Holder* indicating when the checks to the vegetation was undertaken. Where rehabilitation was deemed insufficient, and appropriately qualified specialist must be approached to provide further revegetation measures.

12.2. Contractor

It is the Contractors responsibility to be aware of the requirements of the EMPr, Environmental Authorisation and any other relevant permits/licences and ensure that all labour, appointed sub-contractors/consultants are also made aware of these documents. The Contractor is required to ensure that as per EMPr, EA conditions, and other permits or licences:

- Time allowances/considerations are given to accommodate all relevant activities, when compiling the project programme of works.
- Financial allowances are made to meet all relevant requirements.
- All activities are implemented in an environmentally conscience manner, in line with the EMPr.
- Produce method statements for approval by the ECO and Site Engineer, prior to implementing activities.

The "Construction Contractor" is the entity responsible for undertaking the physical construction of the residential development. The construction contractor is responsible for ensuring that all environmental management measures specified in this EMPr and in the EA are implemented during the pre-construction, construction and post-construction rehabilitation phases, unless agreed otherwise with the Holder. The contractor will be responsible for all costs incurred, in relation to any non-compliances which may occur during implementation of construction activities/rehabilitation activities. The contractor must therefore make adequate financial provision for the implementation of all prescribed measures, in accordance with the Bill of Quantities and the EMPr.

It is strongly recommended that the Construction Contractor appoint an Environmental Site Officer (ESO), who will act as the Contractor's representative to enforce compliance with the conditions of this EMPr, throughout all phases of construction.

In addition to the above, the Construction Contractor is responsible for the following:

- Identify emergency situations that may arise as a result of construction activities and formulate appropriate emergency response procedures.
- Ensure that all construction workers, including sub-consultants and service providers, undergo environmental awareness training prior to commencing work on site, or as soon as possible thereafter.
- Compile the required method statements, which must be to the satisfaction of the ECO, before commencing with the activity to be governed by the method statement.
- Respond to concerns or issues identified by the ECO, as relates to environmental management, and implement the appropriate management or remediation measures, at the Contractor's own expense (unless agreed otherwise).
- Any damage to the surrounding environment (site camp location and outskirts of working corridor) must be noted by the contractor with photo evidence. Any damage identified throughout the operational phase of the proposed extension will be the contractor's responsibility to repair.
- Should third parties be called to the site to perform clean up and rehabilitation procedures, the Construction Contractor will be responsible for all associated costs.

Note that failure to comply with the requirements and conditions of this EMPr and the Environmental Authorisation may result in fines or other penalties being levied against the Construction Contractor by the Competent Authority.

- **Construction Phase Record Keeping**

A copy of the approved EMPr, the Environmental Authorisation and any relevant construction method statements must be kept on site at all times during pre-construction, construction and rehabilitation activities. The ECO Reports must be retained by the *Holder* for a period of at least 5 years and must be provided to the Competent Authority upon request.

The set up and organisation of the site camp is paramount to ensuring compliance. An environmental file is to be created by the contractor and be situated within the site camp throughout the construction phase and with the applicant thereafter. The environmental file is to include the following;

- A copy of the Environmental Authorisation
- A copy of Water Use Licence or any other relative permits
- A copy of the approved EMPr
- Updated Waste slips
- Disposal slips or cleaning slips (ablution cleaning)
- All EMR's (Environmental Monitoring Reports) and ECO instructions
- Copies of Environmental induction register/s
- The Protocol for chance Palaeontological Findings
- A complaints register
- Updated method statements
- Any and all emergency procedure/s applicable to site activities
- An Incident Register

- **Method Statements**

The Competent Authority and/or the ECO may require the *Holder* or Construction Contractor to submit Method Statements for one or more construction-related activity, or any aspect of the management of the site, before the activity is undertaken or during the performance of the activity, if the activity is causing or may cause significant environmental damage, or pose a health and safety risk.

Method Statements need not be complex and lengthy, but must clearly state **how**, **when** and **where** the activity concerned will be undertaken, and must specify **who** will be responsible for undertaking each component of that activity. Method Statements must be prepared by the Construction Contractor and submitted to the ECO for approval before undertaking the activity concerned.

12.3. ECO Monitoring

The appointed ECO is responsible for undertaking regular site visits to monitor and report on the implementation of the EMPr and adherence to the conditions of the Environmental Authorisation during the pre-construction, construction and post-construction rehabilitation phases. The ECO is not required to monitor the site during the operational (maintenance) phase of the development.

Frequency of ECO visits:

- The ECO must conduct **weekly** site visits during the bulk clearing and civils construction phase phase, in addition to the start-up and closure inspections. The site visits to be reduced to monthly for top structures
- The ECO must conduct a site visit 3 months after practical completion of the construction period.
- The ECO has the discretion to undertake additional visits if he / she feels this is justified due to the actions of the contractors, and to make *ad hoc* visits in order to ensure compliance.

Monitoring Reports:

- Must be produced **monthly** and submitted to the Competent Authority, Engineer, Proponent and Contractor.

- **Competency of the ECO**

The ECO must be independent of the Environmental Auditor, Holder, Engineer, Construction Contractor and their service providers. The appointed ECO must be suitably qualified and experienced and must be able to demonstrate that he / she is of sufficient competency to undertake the required task. The ECO must preferably be a resident in close proximity to the development area to ensure quick response if required. The ECO must work in close co-operation with the Construction Contractor, resident engineer or ESO (where applicable) and all contractors in order to identify potential problems before they occur, and provide suitable guidance as to how the identified problems (environmental impacts) can be avoided.

- **Duties of the ECO**

The duties of the ECO include, but are not limited to:

- Conduct a pre-construction site inspection to ascertain the pre-commencement condition of the site (i.e. the status quo);
    - Conduct environmental awareness training, which must include;
    - A brief description of the surrounding environment
    - Importance of the EMPr
    - Roles and responsibilities
    - Identified environmental risks
    - Mitigation measures to be implemented
    - No-go areas
    - Emergency procedures (Hydrocarbon spill)

- Undertake regular site visits to monitor compliance with all mitigation, monitoring and management measures contained in the EMPr and the Environmental Authorisation, during the pre-construction, construction and rehabilitation phases of the development;

- Evaluate the achievement of the performance indicators associated with each impact management objective specified in this EMPr;
- Liaise with site contractors, engineers and other members of the development team with regard to the requirements of the EMPr; Provide guidance as and when required regarding the implementation of the environmental management measures contained in the EMPr and EA, so as to assist the Holder and contractor in remaining compliant with these measures;
- Assist in finding environmentally acceptable solutions to construction problems;
- Examine method statements, where required;
- Recommend additional environmental protection measures, should this be necessary;
- Furnish contractors with verbal warnings in case of contravention of the EMPr;
- Recommend that the competent authority furnish errant contractors with predetermined fines, when verbal and / or written warnings are ignored;
- Ensure satisfactory rehabilitation of disturbed areas on site, after construction is complete;
- Keep detailed records of all site activities that may pertain to the environment, and produce monthly compliance-monitoring reports (ECO Reports) for submission to the Holder, and the Competent Authority at regular intervals during the construction phase;
- Submit a final post-construction inspection report, within 6 months of completion of the construction phase. The audit report must detail the rehabilitation measures undertaken,

describe all major incidents or issues of non-compliance and any issues or aspects that require attention or follow-up.
- All ECO Reports and Inspection Reports must be submitted to the Holder and Competent Authority.

- **Authority of the ECO**

The ECO has the authority to recommend to the decision-making authorities that they suspend all works (or part thereof) occurring on site, should any action being undertaken on site not comply with the environmental requirements, and where such actions pose a serious threat to any element of the surrounding environment.

The ECO has the authority to issue instructions to the Construction Contractor and/or Holder, regarding measures that must be implemented on site in order to ensure compliance with the EMPr and Environmental Authorisation, and/or to prevent environmental degradation or pollution from occurring.

The ECO has the authority to issue verbal and written warnings to contractors. Should verbal and written instructions and/or warnings be ignored, the ECO has the authority to request the Competent Authority to issue pre-determined fines or other penalties.

The ECO has the authority to report incidents of non-compliance to the Competent Authority at any time.

- **ECO Inspections - Written Records**

The following record-keeping during the pre-construction, construction and rehabilitation phases of the development is recommended:
- The ECO must complete an ECO Checklist after each ECO site visit.
- The ECO must compile an ECO monitoring report and submit this to the *Holder*, the Contractor and the Competent Authority (the latter only if required by the Competent Authority). The monthly reports must be a summary of the ECO inspections from the preceding month, and must highlight the key concerns/ issues on site, instances of non- compliance with the EA and EMPr, all instructions issued to the contractor, actions taken and aspects that still require attention.
- All ECO reports and ECO instructions must be retained on file at least for the duration of the construction period (retaining reports for a period of at least 5 years is recommended, in the event that the Competent Authority must request information).
- A record (minutes) of construction site meetings, liaison site meetings between the ECO and resident engineer or contractor, monitoring reports, ECO instructions and ECO observations must be clearly documented and filed on a master file off-site for safe keeping.
- It is recommended that a site register (incident register) be kept on site at the site office for the recording of any environmental incidents (e.g. fires, spills etc.), observations which are contrary to the stipulations within the EMPr, and any other contravention deemed necessary for the attention of the resident engineer. Actions taken to remedy the incidents must also be recorded.
- A complaints register must be kept on site in which complaints by any member of the public must be logged.

The ECO must compile a final post-construction audit report, within 3 months of completion of each construction phase. The audit report must detail the rehabilitation measures undertaken, describe all major incidents or issues of non-compliance and any issues or aspects that require attention or follow-up.

12.4. ESO Monitoring

Due to the nature of this development, an Environmental Site Officer (ESO) must be appointed. The site officer will be responsible for implementing and monitoring the site activities daily. This individual must be appointed by the Main Contractor. The ESO will be responsible for actively managing activities on-site. The ESO must:

- Have a site diary wherein they report all environmental incidents daily;
- Ensure that all environmental filing relevant to the project is up to date;
- Ensure that the working areas, site camp facilities, access roads and no-go areas are properly demarcated;
- Ensure that proper topsoil management practices are adhered to on site;
- Ensure that proper waste management & pollution prevention strategies are practised on site;
- Keep proper Incident reports on record of all incidents, including all remediation action-documents. These reports and documents must be made available to the ECO, Site Contractor, Site Engineer and the DEADP when required;
- Be present and give report on all incidents at all site meetings for the project.

12.5. Auditing by Environmental Auditor

In accordance with the requirements of the Environmental Impact Assessment Regulations, 2014 (as amended), the Holder of the Environmental Authorisation must, for the period that the Environmental Authorisation is valid, appoint a suitably qualified independent (external) person to conduct an environmental audit to audit compliance with the conditions of the Environmental Authorisation and the EMPr. As per Section 34 of the EIA Regulations (GN R326 of 2017), the duty of an Environmental Auditor is to be in dependent and is responsible for:

- Ensuring compliance with the conditions of the environmental authorisation and the EMPr; and
- Submit an environmental audit report to the relevant competent authority, which provides verifiable findings, in a structured and systematic manner, as per Appendix 7 of GN R326.
- Any amendments to the EMPr, which must be recorded in Appendix F.

The Holder is responsible for appointing, managing and remunerating the appointed auditor. The auditor may **not** be the appointed ECO.

The appointed auditor is to be provided with the completed EMR's and Checklists, as well as any other crucial information that may be relevant or requested (incident report, waybills etc) in order to effectively report on the level of compliance with the conditions of the environmental authorisation and the EMPr. The appointed auditor must undertake environmental audits during prior to the commencement of each phase, at the following stages;

- **6 months after the commencement of construction activities;**
- **Annually for the remainder of the construction phase;**
- **Upon completion of construction phase; and**
- **3 months after the practical completion of construction.**

Following each audit, the environmental auditor must submit an audit report to the Competent Authority (in this instance the DEADP) Environmental auditing and environmental audit reports must adhere to the requirements of the amended 2014 Environmental Impact Assessment Regulations, in particular Section 34 (*Auditing of Compliance with Environmental Authorisation, Environmental Management Programme*) and Appendix 7 (*Objective and Content of Environmental Audit Report*)

The audit report must provide verifiable findings on the level of compliance with the provisions/ conditions of the Environmental Authorisation and the EMPr and must also comment on the ability of the measures contained in this EMPr to sufficiently avoid, manage and mitigate environmental impacts.
Where the findings of the audit report indicate that the impact management measures stated in the EMPr are insufficient to adequately address environmental impacts, recommendations as to how the EMPr must be amended so as to address the identified shortcomings must be made and submitted to the competent authority together with the audit report.

12.6. Responsibilities of the Home Owners Association (HOA)

Upon completion of the construction phase (or if a phased construction methodology is followed, upon completion of any one construction phase and resident occupancy is taken). The HOA will be responsible for implementing the operational aspects of the EMPr.

13. PENALTIES, CLAIMS AND DAMAGES

The contractor will be responsible for all costs incurred in the rehabilitation of the site and for ensuring that all procedures required to rehabilitate the site are implemented. If third parties are called to the site to perform clean up and rehabilitation procedures, the contractor will be responsible for all costs. The competent authority may impose penalties on the *Holder* or any of the contractors if conditions contained in this EMPr are contravened. This would be based on an agreement or contract between the *Holder* and the contractor.

Penalties could be imposed in terms of Chapter 11 of the Western Cape Bill on Planning and Development as published in the Extraordinary Provincial Gazette No 5183, 3 October 1997, and would be applicable for any action which leads to damage to the natural environment. Please note that the payment of any fines in terms of the contract shall not absolve the offender from being liable from prosecution in terms of any law.

In cases where severe environmental damage occurs, the competent authority law enforcement division may take legal action against the responsible parties. The reasons for this could include, among others:

- Not implementing the conditions of the EMPr;
- Spillage that results in environmental damage;
- Incorrect handling and storage of construction materials and chemicals;
- Sensitive areas that are not clearly demarcated;
- Performing ablutions in areas other than facilities provided for such actions; and
- Occurrence of unattended and out of control fire.

The Contractor shall comply with the environmental specifications and requirements on an ongoing basis and any failure on his part to do so will entitle the ECO to issue the contractor with penalty / fine as described in the following section.

The following offences, level of severity and value of the financial fines have been drafted according to the sensitivities on the proposed site, the mitigation measures proposed, and the construction methods proposed. It must be noted that the level of severity is at the discretion of the ECO and any offences or fines will be recorded in the ECO's monitoring report. The fineable offences are not limited to the table below, additional offences may be applied by the ECO with prior agreement with the EA *Holder*.

The following fine structure shall apply:

Table 3: Fines and offences

Finable Transgression	Min Fine	Max Fine
Failure to notify the ECO of the commencement of construction or pre-construction activities, prior to the commencement of such activities.	R1 000	R2 000
Failure to comply with the provisions relating to the demarcation of the working area, site camp and associated facilities, and the maintenance of the demarcated boundaries.	R1 000	R5 000
Failure to comply with the provisions relating to the demarcation of all "no-go" areas, and the maintenance of the demarcated boundaries.	R2 000	R5 000
Failure to provide secured ablution facilities (1:30 ratio) on site.	R500	R15 000
Failure to comply with the provisions relating to the clearance of vegetation on site.	R2 000	R5 000
Clearance of indigenous vegetation (regardless of the density of alien vegetation present) outside of the demarcated boundaries of the working area and site camp.	R2 500	R15 000
Failure to apply herbicide to alien vegetation when required to do so.	R500	R2 000
Failure to adhere to designated access routes and/or the driving of vehicles through undeveloped vegetation outside of the demarcated working area or site camp.	R1 000	R5 000
Movement of vehicles and/or construction workers in no-go areas;	R1 000	R10 000
Parking or storage of vehicles, machinery, tools and other materials or equipment related to the Contractors operations, within designated "no-go" areas.	R1 000	R10 000
Parking or storage of vehicles, machinery, tools and other materials or equipment related to the Contractors operations, outside of the areas demarcated for such parking/storage.	R500	R5 000
Failure to comply with the provisions relating to the management of topsoil and subsoil.	R1 000	R5 000
Excessive excavation of material in areas not depicted for such purpose / activity on the approved design plans.	R2 500	R10 000
Failure to comply with the provisions relating to waste management on site i.e. recycling of wastes.	R500	R5 000
Failure to comply with the provisions relating to the storage, use and management of hazardous substances and fuels on site and/or the spillage of hydrocarbons or hazardous substances on site leading to environmental damage.	R1 000	R10 000
Mixing cement or concrete on bare ground and/or failure to comply with any other provision regarding cement/ concrete batching.	R1 000	R5 000
Failure to provide adequate fire-fighting equipment (in working order) on site at all times and/or failure to comply with the provisions relating to fire prevention and/or the occurrence of unattended or out of control fires.	R500	R5 000
Refueling of vehicles, machinery or equipment outside of the designated refueling area.	R500	R2 000
Maintenance of vehicles, machinery or equipment outside of the designated maintenance yard, except in emergencies.	R500	R2 000
Failure to undertake refueling or repairs over a drip tray or other impermeable bunded surface to collect spilled hydrocarbons (fuels, lubricants, oils etc.) and other hazardous substances; failure to provide drip trays under fuel burning equipment (including pumps and generators) where there is a risk of hydrocarbon leakage.	R500	R2 000
Failure to produce a required method statement/s to the engineer's and ECO's satisfaction prior to undertaking the activity concerned and/or failure to adhere to an approved method statement.	R1 000	R5 000

The above does not absolve the transgressor from being prosecuted in terms of the ***National Environmental Management Act (Act 107 of 1998)*** which may result in further penalties and other actions by State Departments.

14. EMERGENCY PREPAREDNESS

14.1. Emergency response procedures

The potential environmental risks that may arise as a result of construction activities, or during the maintenance of the structures must be identified, and appropriate emergency response procedures must be compiled for each emergency scenario. Potential environmental emergencies that require an emergency response include, but are not limited to, unplanned fires, sewage spills, spills of hazardous chemicals, snake bites etc.

The construction contractor Is responsible for identifying potential significant environmental risks that may arise as a result of pre-construction, construction and rehabilitation activities, and the contractor must formulate emergency response procedures for these potential incidents.

The ECO, contractor and the EA *Holder* are responsible for ensuring that all construction workers appointed to the project are aware of the emergency procedures and are properly trained on how to identify and respond to an emergency incident during construction.

Please note that this EMPr only applies to the labourers, contractors, site managers, and engineers appointed, unless specified otherwise, to fulfil the requirements of the proposed development.

An emergency procedure must clearly indicate who will take charge during an emergency, and the roles and responsibilities of workers and authorities during an emergency.

The construction contractor is responsible for ensuring that the requirements of the Occupational Health & Safety Act (Act 85 of 1993) (OHS Act) are adhered to during the construction phase. The *Holder* is responsible for ensuring compliance with the OHS Act during the undertaking of operational and maintenance activities.

All workers on site during the construction and operational phase must be properly educated about possible emergency incidents that may arise, how to avoid such incidents and how to respond in the event of an incident. "Refresher" training sessions on emergency procedures must be held if needed.

All workers must ideally be given basic fire-awareness training, as well as be advised on basic firefighting and safety techniques. Fire-fighting equipment must be available on-site during construction and operational activities.

All workers must be trained on how to respond in the event of a spill of a hazardous substance (fuel, chemicals etc.), if hazardous substances are to be used on site.

A spill kit for containing and/or neutralising spills of hazardous substances (e.g. hydrocarbons) must be available on site at all times, when hazardous substances are present.

Any incidents of pollution or spillage of hazardous materials during construction must be reported to the ECO as soon as possible. The ECO must then (depending on the nature of the spill) notify the relevant authorities, if needed. During the operational phase of the development, the EA *Holder* is responsible for notifying the relevant authorities of any pollution incidents that arise.

A first aid kit must be available on site at all times.

Emergency contact numbers (including the fire department, police and ambulance) must be prominently displayed on site at all times and regularly updated.

All emergency incidents must be recorded in a site incident log. The cause of the incident, the measures taken in response to the incident and the efficacy of those measures must also be recorded. This information must be used to inform future emergency preparedness planning, and to avoid prevent similar incidents from arising again.

14.2. Emergency preparedness

The following measures must be implemented, as appropriate, to ensure effective responses to emergencies:

- All workers on site during the construction and operational phase must be properly educated about possible emergency incidents that may arise, how to avoid such incidents and how to respond in the event of an incident. "Refresher" training sessions on emergency procedures must be held if needed.
- All workers must ideally be given basic fire-awareness training, as well as be advised on basic firefighting and safety techniques. Fire-fighting equipment must be available on-site during construction and maintenance activities.
- All workers must be trained on how to respond in the event of a spill of a hazardous substance (fuel, chemicals etc.), if hazardous substances are to be used on site.
- A spill kit for containing and/or neutralising spills of hazardous substances (e.g. hydrocarbons) must be available on site at all times, when hazardous substances are present.
- Any incidents of pollution or spillage of hazardous materials during construction must be reported to the ECO as soon as possible. The ECO must then (depending on the nature of the spill) notify the relevant authorities, if needed. During the operational phase of the development, the *Holder* is responsible for notifying the relevant authorities of any pollution incidents that arise as a result of maintenance activities.
- A first aid kit must be available on site at all times.
- Emergency contact numbers (including the fire department, police and ambulance) must be prominently displayed on site at all times and regularly updated.
- All emergency incidents must be recorded in a site incident log. The cause of the incident, the measures taken in response to the incident and the efficacy of those measures must also be recorded. This information must be used to inform future emergency preparedness planning, and to avoid prevent similar incidents from arising again.

15. ENVIRONMENTAL AWARENESS PLAN

Environmental Awareness Training must be conducted prior to the commencement of construction activities. It is the *Holder's* responsibility to familiarise himself/herself with the content and requirements of this EMPr. The *Holder* is also responsible to ensure that the contractor and all labourers working on site during the construction phase are familiar with the content of this EMPr.

The following actions must be taken to ensure that all relevant parties are aware of their environmental role and duties:

- This EMPr must be kept on site at all times.
- The provisions of this EMPr and the conditions of the Environmental Authorisation must be explained in detail to all staff during Awareness Training.

- Training booklets will be handed out to all labourers and must be explained to them.
- Weekly checks to be done by the *Holder's* environmental representative who must be on site at all times.
- The ECO to conduct frequent site visits.
- Monthly monitoring reports to be compiled by the ECO. These reports will be circulated to all parties involved (including the *Holder*, contractor and the competent authority where required).

The Construction Contractor must make allowance for all construction site staff, including all subcontractors that will be working at the site, to attend environmental awareness training sessions (undertaken by the ECO) before commencing any work on site. During this training, the ECO will explain the EMPr, and the conditions contained therein. Attention will be given to the construction process and how the EMPr fits into this process. Other items relating to sound environmental management which must be discussed and explained during the environmental awareness training sessions include:

- The demarcated "no-go" areas.
- General dos and don'ts of the site.
- Making of fires.
- Waste management, use of waste receptacles and littering.
- Use of the toilets provided.
- Use and control of construction materials and equipment etc.
- Control, maintenance and refuelling of vehicles.
- Methods for cleaning up any spillage.
- Access and road safety.
- Emergency procedures (e.g. in case of fire, spillage etc.).
- Explanation of the importance of complying with the EMPr.
- Discussion of the potential environmental impacts of construction activities.
- The benefits of improved personal 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.
- General "best practice" principles, with regards to the protection of environmental resources.

Environmental awareness training and education must be ongoing throughout the construction phase and must be undertaken regularly if deemed necessary (especially if it becomes apparent that there are repeat contraventions of the conditions of the EMPr), or as new workers come to site. Translators must be utilised where needed.

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 A – CURRICULUM VITAES OF EAPS

APPENDIX B – LAYOUT PLAN

APPENDIX C – MAP OF ENVIRONMENTAL SENSITIVITIES

APPENDIX D - SCREENING TOOL

APPENDIX E - PROTOCOL FOR CHANCE FOSSIL FINDS

<table>
<tr><td></td><td></td></tr>
<tr><td>Responsible Heritage Resources Agency</td><td>HERITAGE WESTERN CAPE (Contact details: Protea Assurance Building, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 086-142 142. Fax: 021-483 9842. Email: hwc@pgwc.gov.za)</td></tr>
<tr><td>ECO protocol</td><td>1. Once alerted to fossil occurrence(s): alert site foreman, stop work in area immediately (N.B. safety first!), safeguard site with security tape / fence / sandbags if necessary.</td></tr>
<tr><td colspan="2">2. Record key data while fossil remains are still in situ:

Accurate geographic location – describe and mark on site map / 1: 50 000 map / satellite image / aerial photo

Context – describe position of fossils within stratigraphy (rock layering), depth below surface

Photograph fossil(s) in situ with scale, from different angles, including images showing context (e.g. rock layering)</td></tr>
<tr><td>3. If feasible to leave fossils in situ:

Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation

Ensure fossil site remains safeguarded until clearance is given by the Heritage Resources Agency for work to resume</td><td>3. If not feasible to leave fossils in situ (emergency procedure only):

Carefully remove fossils, as far as possible still enclosed within the original sedimentary matrix (e.g. entire block of fossiliferous rock)

Photograph fossils against a plain, level background, with scale

Carefully wrap fossils in several layers of newspaper / tissue paper / plastic bags

Safeguard fossils together with locality and collection data (including collector and date) in a box in a safe place for examination by a palaeontologist

Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation</td></tr>
<tr><td colspan="2">4. If required by Heritage Resources Agency for the removal and processing of uncovered fossils, ensure that a suitably-qualified specialist palaeontologist is appointed as soon as possible by the developer.</td></tr>
</table>

APPENDIX F - EMPR REVIEW AND AMENDMENT REGISTER

EMPR REVIEW AND AMENDMENT REGISTER

Review Date	Description of Review and/or Amendment	Signature

APPENDIX G - ALIEN INVASIVE MANAGEMENT PROGRAMME

Invasive alien plants have a significant negative impact on the environment by causing direct habitat destruction, increasing the risk and intensity of wildfires, and reducing surface and sub-surface water. Landowners are under legal obligation to control alien plants occurring on their properties. Alien Invasive Plants require removal according to the Conservation of Agricultural Resources Act 43 of 1983 (CARA) and the National Environmental Management: Biodiversity Act (10 of 2004; NEMBA): Alien and Invasive Species Lists (GN R598 and GN R599 of 2014).

Category 1a and 1b listed invasive species must be controlled and eradicated. Category 2 plants may only be grown if a permit is obtained, and the property owner ensures that the invasive species do not spread beyond his or her property. The growing of Category 3 species is subject to various exemptions and prohibitions. Some invasive plants are categorised differently in different provinces. For example: the Spanish Broom plant is categorised as a category 1b (harmful) invasive plant in Eastern Cape and Western Cape, but it is a category 3 (less harmful) invasive plant in the other seven provinces.

Alien control programmes are long-term management projects and a clearing plan, which includes follow up actions for rehabilitation of the cleared area, is essential. This will save time, money and significant effort. Collective management and planning with neighbours allow for more cost-effective clearing and maintenance considering aliens seeds as easily dispersed across boundaries by wind or water courses. All clearing actions should be monitored and documented to keep track of which areas are due for follow-up clearing. Alien grasses are among the worst invaders in lowland ecosystems adjacent to farms but are often the most difficult to detect and control.

Several exotic invasive and other weed species were noted within the site, ranging from a few scattered individuals to dense infestations. The dense localised infestations of these tree species have a noticeable and definite impact to the habitat present and are a significant source of degradation. A weed management programme, as part of the construction contract including an after-care period will be required, until such time as natural vegetation has become adequately re-established. A two year after-care period is recommended and must be implemented by the HOA through the use of an appointed alien invasive management company.

Invasive alien and weed species within the demarcated working areas must be removed in accordance with the regulations contained in the National Environmental Management: Biodiversity Act (NEM:BA, Act 10 of 2004), the Invasive Species Regulations (October 2014), the Conservation of Agricultural Resources Act (CARA, Act 43 of 1983) and the Duty of Care principle contained in NEMA, Section 28. Removal of species should take place throughout the construction, operational, and maintenance phases, in accordance with the following:

- In consultation with the ECO, the Contractor must control the establishment of alien invasive species along the working corridor on an ongoing basis during construction and follow-up clearance to be conducted for a 3-year period.
- The Contractor is responsible for the removal of alien species within all areas disturbed during construction activities. Disturbed areas include (but are not limited to) access roads, construction camps, site areas and temporary storage areas.
- In consultation with relevant authorities, the Engineer may order the removal of alien plants (when necessary) within the confines of the site are to be included.
- In consultation with the ECO, any alien vegetation (including brushwood and seed-bearing material) that is cleared must be disposed of at an appropriately registered waste disposal facility.
- Removal of alien vegetation are to be done according to the Working for Water Guidelines.
- The following control measures may be used to ensure that the introduction and spread of alien invasive vegetation is minimised:
- Seedlings and saplings can be removed through hand pulling and hoeing, treated with herbicide through a foliar spray or basal stem treatments.
- Mature trees can be felled, or ring barked or treated with herbicide by means of frilling or cut stump treatment.
- Herbicide should not be applied in wet or windy conditions.
- Care should be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used;
- Footprint areas should be kept as small as possible when removing alien plant species; and
- After clearing is completed, an appropriate cover crop may be applied as provided in Rehabilitation Programme, should natural re-establishment of indigenous vegetation not take place in a timely manner.

APPENDIX H - REHABILITATION PROGRAMME

DRAFT REHABILITATION PROGRAMME

Rehabilitation Objective
The overall objective of the rehabilitation plan is to minimize adverse environmental impacts associated with the activity whilst maximizing the future utilization of the site. Significant aspects to be borne in mind in this regard is, revegetation of undeveloped footprint and stability and environmental risk. Additional broad rehabilitation strategies / objectives include the following:

- All infrastructure, equipment, plant and other items used during the construction period will be removed from the site.
- Waste material of any description, including scrap, rubble and tyres, will be removed entirely from the site and disposed of at a recognised landfill facility. It will not be permitted to be buried or burned on site.
- Final rehabilitation shall be completed within a period specified by the DEADP and/or Cape Nature, if stipulated.
- Final landscaping and rehabilitation of the site must be done to the satisfaction of the ECO and must adhere to all conditions/ requirements of the Environmental Authorisation.

Topsoil and Subsoil Replacement
Topsoil and subsoil will be stripped and stockpiled separately and only used in rehabilitation work towards the end of the operation. This is in contract to the gravel activity where rehabilitation and topsoil replacement was earmarked at the completion of each phase.

Stripped overburden will be backfilled into the worked-out areas where needed. Stripped topsoil will be spread over the re-profiled areas to an adequate depth to encourage plant regrowth. The vegetative cover will be stripped with the thin topsoil layer to provide organic matter to the relayed material and to ensure that the seed store contained in the topsoil is not diminished. Reseeding may be required should the stockpiles stand for too long and be considered barren from a seed bank point of view. Stockpiles should ideally be stored for no longer than a year.

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

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

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

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

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

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

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

Monitoring and Reporting
Adequate management, maintenance and monitoring of rehabilitation success will be carried out annually for at least 2 years by the EA Holder to ensure successful rehabilitation of the property until a closure certificate is obtained.

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

APPENDIX J: ENVIRONMENTAL AWARENESS BOOKLET

APPENDIX K: SPECIES RELOCATION AND MANAGEMENT PROGRAMME

In accordance with the requirements of the respective specialists, the following faunal and floral components of concern were raised:

- Unidentified Orchid Specie (Not determined)s; and
- Duthies Golden Mole (*Chlorotalpa duthieae*) (Vulnerable)
- It should be noted that the population of the Golden Moles were identified within the confines of the alien invasive forest located on Portion 8 of the Farm Krans Hoek 432. Which, must be managed in accordance with the Conservation of Agricultural Resources Act.

This species relocation and management plan has been compiled in light of all three of the components. As per the Corridor management plan compiled by Ruan Siebert (Species and Search and Rescue Specialist) and Dr. Jacobus Visser (Animal Species Specialist), with Jamie Pote (Terrestrial Biodiversity and Plant Species Specialist) taking cognisance and making further recommendations thereto, the following management procedures are recommended towards the management of the orchid species, the alien invasive forest and the population of Dutjie's Golden Moles within the proposed development site.

The following is described by the Terrestrial Biodiversity Specialist:
Typically, Duthie's Golden Mole is a forest dwelling species, the site is typically outside of its preferred habitat, however it is likely that the alien tree invasion has created artificial suitable habitat. Refer to separate faunal assessment for a more detailed assessment of faunal species, including the Golden Mole. Since the area where this species occurs is densely invaded with declared alien invasive trees, which require removal in terms of CARA/NEMBA, permits may be required to retain the exotic tree species.

The objectives of this management plan are to care for Kranshoek farm No.432 ecosystem corridor by means of providing a ecological corridor with the following conservation objectives in mind:

In order of priority:

- Fencing the conservation area to prevent negative impacts from livestock grazing, illegal dumping, fire risks, general pollution and vagrants.
- Controlling alien invasive plant species.
- Reintroduce orchid species from the Kranshoek plant search and rescue.
- Plant localised indigenous trees to replace the Eucalyptus population in order to secure a long term habitat for the Duthie's Golden Moles

The limitations associated with this corridor management strategy is that managing this area is to conduct the alien invasive plant control in a manner that does not disturb the population of Duthie's Golden Moles. The limitations to exotic plant clearing include no use of heavy machinery and no fire in this site. It is important to consider that the work done in this area should be sensitive towards the conservation area and aim towards enhancing biodiversity in this area.

Recommended Methods for Exotic Clearing:
Exotic clearing is to be conducted in the whole 4ha environmental corridor and we would recommend implementing this action in different phases.

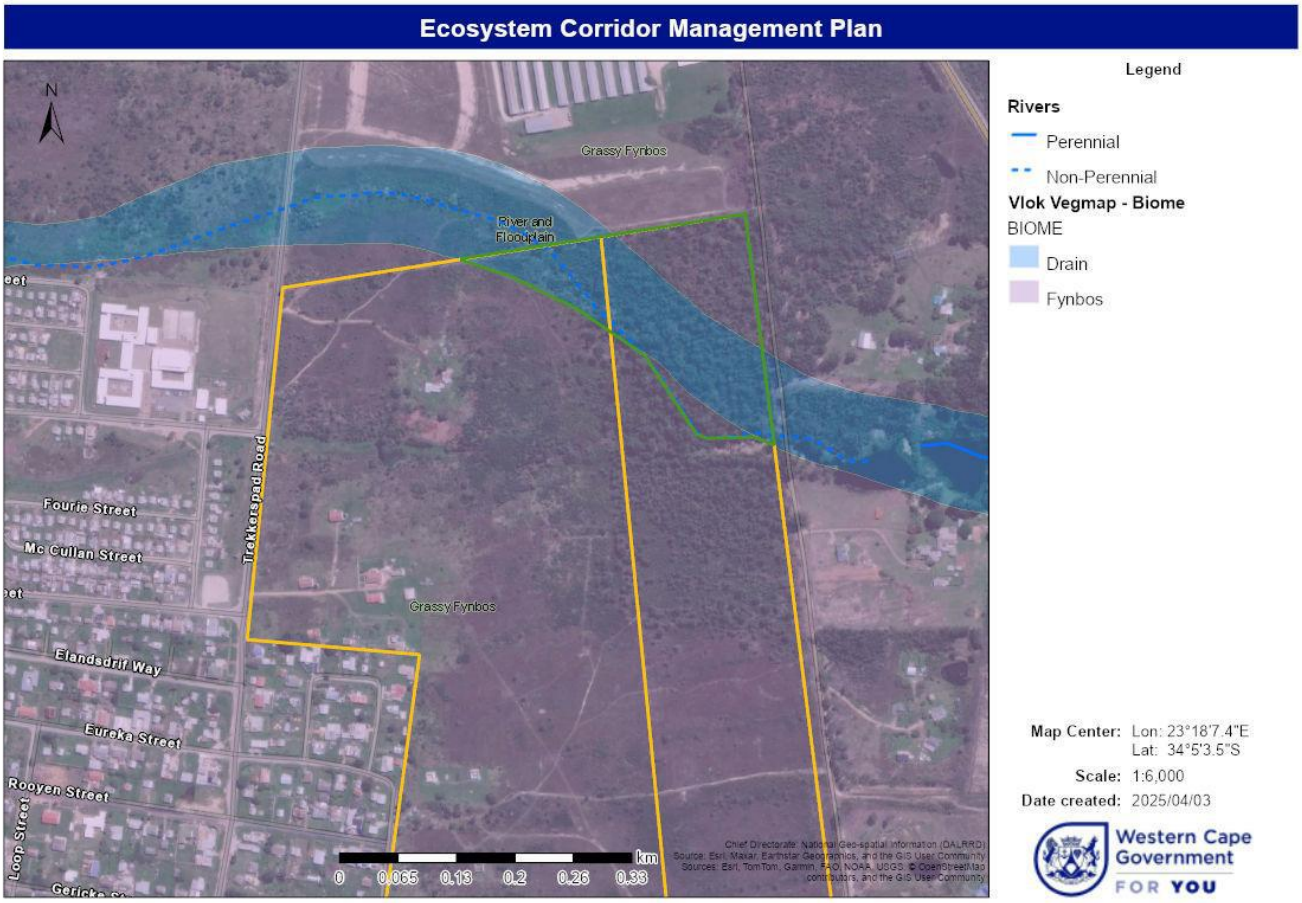


Figure 2: Conservation area in need of alien invasive plant control

It is recommended that the alien invasive plant control is done by mainly using a method known as ringbarking conducted by experienced manual labour. This is the least destructive manner of removing the unwanted exotic species and it also does not require the use of herbicide which is a great positive as there is also a freshwater stream in this area that needs to be worked around with sensitivity. All small trees can be tackled with tools known as tree poppers which remove the tree root and all.

Medium sized trees that are able to be felled with chainsaws could be cut into manageable sized biomass and processed into wood for the Kranshoek community and branches to be chipped adjacent to the reserve area.

Alien invasive plant species present include:
Acacia cyclops, Eucalyptus, Hakea, Pinus radiata.

It is recommend that the exotic clearing be conducted by a team of experienced workers from the Kranshoek community. Garden Roots Project would be interested in overseeing this process by doing an initial introduction of the methodology to the chosen contractor and follow up with bi-weekly site visits to oversee the progress.

The following schedule is recommended by the various specialists:

Year 1: It would be good to start with removing all young aliens with tree poppers and aim for a 50% reduction in medium and large alien invasive species in the first phase in order to allow local vegetation to fill those gaps in vegetation. Clear cutting all the alien invasives in one phase would lead to an aggressive regrowth from the aliens so it is important to do this systematically and work with the local vegetation to fill the gaps formed from a phased clearing approach.

Year 2: Follow up on any young alien invasives that sprout up after the 50% reduction and continue with a further reduction of alien invasive species and biomass removal.

Year 3: Final work to be done on exotic clearing and get the conservation area to the desired state of predominantly local indigenous species.

Reintroduction of Search & Rescue Species: Once the fence is up and the alien invasive species control phase 1 is complete the site would be due for a visit from Garden Roots & Cape Nature to do a vegetation survey and assess whether it would be wise to introduce the orchid species to this allocated conservation area.