ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

FOR KUSILE TRUCK STOP ON PART OF PORTION 83 (A PORTION OF PORTION 20) OF THE FARM EENZAAMHEID 534 JR

FOR PUBLIC REVIEW

Applicant:

Chapmans View Properties (Pty) Ltd

July 2018

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GLOSSARY

Environmental Management Programme (EMPr)

The EMPr is an action plan that deals with the measures required to mitigate and manage impacts and needs to detail mitigation measures and roles and responsibilities (GN 654, 29 June 2010). This EMPr will be included as Appendix 9 of the BAR and submitted to MDARDLEA for Environmental Authorisation (EA). Upon approval, this document will be used for site environmental compliance during the construction- and operation phase of the project.

Environment

In terms of the National Environmental Management Act [NEMA], (1998) Act No. 107 of 1998 as amended, 'environment' is defined as the *environment in which humans exist* and that is made up of

(i) Land, water and atmosphere of the earth;

(ii) Micro-organisms, plant and animal life;

(iii) Any part of combination of (i) and (ii) and the interrelationships among and between them;

(iv) Physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

Rehabilitation

Rehabilitation is defined as the return of a disturbed area to a state which approximates the state, as far as possible, which it was before disruption. Rehabilitation should aim to accelerate the natural succession processes so that the plant community develops in the desired way (Henning, van Eden, Pienaar, 2009).

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ABBREVIATIONS

(That may have been used or referenced in the document)

BAR	-	Basic Assessment Report
DWS	-	Department of Water and Sanitation
EA	-	Environmental Authorisation
EAP	-	Environmental Assessment Practitioner
ECO	-	Environmental Control Officer
EMPr	-	Environmental Management Programme
MDARDLEA	-	Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs
SDS	-	Safety Data Sheets
NEMA	-	National Environmental Management Act, 1998
NWA	-	National Water Act, 1998
OHSA	-	Occupational Health and Safety Act, 1993
PPE	-	Personal Protective Equipment
REG	-	Regulation
SABS	-	South African Bureau of Standards
SANS	-	South African National Standards
SAHRA	-	South African Heritage Resources Agency
SEA	-	Strategic Environmental Assessment
SUDS	-	Sustainable Urban Drainage Systems
WSUDS	-	Water Sensitive Urban Design
WUL	-	Water Use License

LIST OF APPENDICES

Specialist Reports

- Ecological Habitat Assessment Report;
- Wetland Assessment Report; and
- Heritage Impact Assessment Report.

Note: Appendices to be attached to the EMPr for distribution once construction commences. For the purposes of review and authorisation by MDARDLEA, appendices have been attached to the BAR, under the relevant sections.

1. Introduction

1.1. Project Background and Description

Chapmans View Properties (Pty) Ltd is proposing to develop a residential township on Portion 83 of the Farm Eenzaamheid 534 JR (hereinafter referred to as 'the study site') within the Emalahleni Local Municipality, Mpumalanga Province.

The proposed configuration of the proposed development encompasses the following:

The proposed development involves the construction and operation of a Diesel and Petroleum outlet facility with ancillary uses and the proposed installation of underground diesel and petroleum tanks. A minimum of three tanks and a maximum of 5 tanks of variable sizes (23 000 litres minimum and 80 0000 litres maximum) for the storage of fuel with a minimum of 80 cubic metres, but not exceeding 500 cubic metres, will be installed.

Related infrastructure includes a convenience store/shop, restrooms, restaurant, recreational area, truck stop and offices.

The sewage and waste water will be treated with a Lilliput treatment system.

The water supply design criteria for the development site is to provide 0,4 kl / day / 100m2 developed space. As the development would be limited to a 1 hectare stand with a Floor Area Ratio (FAR) of 0.7, the maximum developed space would be 7 000m2, resulting in a water demand of 28 kl / day. Water will be supplied through the existing borehole located on site; refer to Appendix A for the borehole position. The water will be treated to the required standards for domestic use and pumped to a 60 cubic metre storage tank located at an elevation high enough to provide sufficient pressure to the development site for domestic and fire requirements.

Initially, during phase 1, electricity to the development will be provided by two 10MWA Generators to supply 220V for the infrastructure and in phase 2, power supply will be from a new three phase 6.6kV overhead powerline, to 380V to 220V to be sourced from Eskom, from the existing 6.6kV overhead powerline, running east of the study area.

Access to site will be provided from the newly constructed R686, Lone Rock Road, also providing access to the Kusile power station.

A Basic Assessment application are required for the proposed residential development as this development triggers the following activities under the EIA Regulations, 2014 [as amended in 2017]:

Listing Notice 1 (GN R 983 of 4 December 2014) [as amended]:

Activity 14: The applicant proposes to develop and operate facilities and infrastructure for the storage and handling of dangerous goods including petroleum and diesel with a combined capacity of 500 cubic metres. The construction of a Diesel and Petroleum outlet facility with ancillary uses and the proposed installation of diesel and petroleum tanks. Tanks of variable sizes (23 000 litres minimum and 80 000 litres maximum) for the storage of fuel with a minimum of 80 cubic meters, but not exceeding 500 cubic meters will be installed. Other related infrastructure such as, a convenience store/shop, restrooms, restaurant, recreational area, truck stop, offices will be constructed and will form part of the application.

Activity 27: The study area is approximately 2.5 Ha in extent and contains disturbed, but natural vegetation. An area of larger than 1 hectare, but less than 20 hectares of indigenous vegetation will be cleared for the activity.

Activity 28: The study area is larger than 1 hectare in extent, occurs outside an urban area and has been used for agricultural purposes after 1 April 1998.

In terms of Heritage Resources, Prism EMS have also applied for a Heritage License under the **National Heritage Resources Act [NHRA], 1999 (Act no. 25 of 1999):**

- For Heritage Impact Assessments as required in Section 38(8) of the NHRA.

1.2. Project Location

The proposed development is planned to be located on Portion 83 of the Farm Eenzaamheid 534 JR at Balmoral within the Emalahleni Local and Nkangala District Municipalities, Mpumalanga Province. The study area is located immediately south of the R686 (Lone Rock Road), approximately 2 km south of the N4 Highway.

The Surveyor General 21-digit diagram number for the affected property is provided in Table 1.

Table 1: Surveyor General Diagram Number

Farm	Surveyor General Diagram number
534	T0JR00000000053400083

Table 2: Coordinates of the Study Area

	Latitude (S):	Longitude (E):
Proposal and Alternatives	25°53'18.85"S S25.888570	28°57'28.09"E E28.957800

Refer to Figure 1 for a visual indication of the study area's location in relation to major roads and towns.

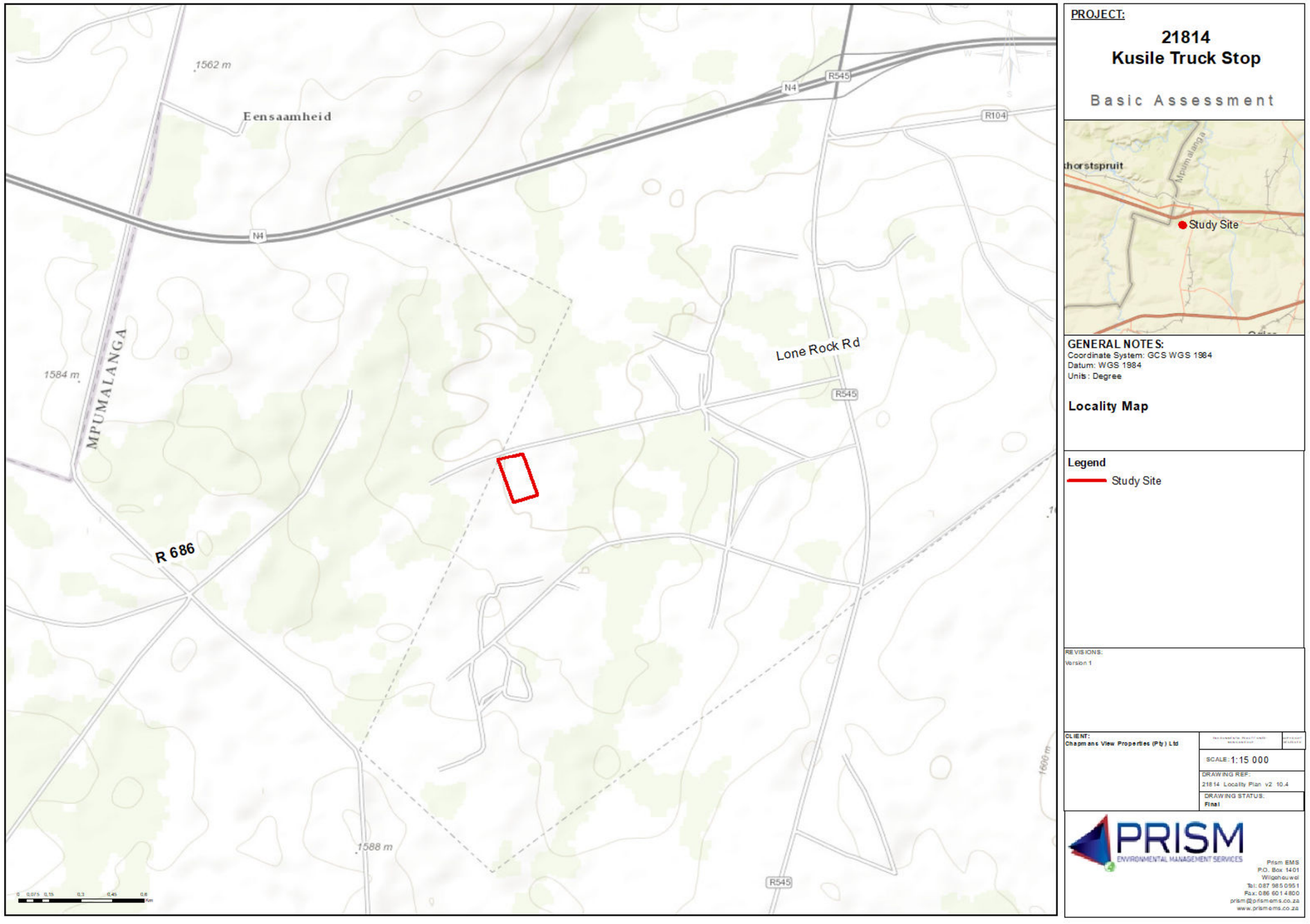

Figure 1: Locality map indicating the proposed development

1.3. Details of the Applicant

The applicant is the entity that will assume responsibilities as the holder of the environmental authorisation, if granted. Details of the applicant are contained in **Table 3**.

Table 3: Details of the Applicant and Landowner

Applicant:	Chapmans View Properties (Pty) Ltd
Landowner:	Chapmans View Properties (Pty) Ltd
Responsible Person:	Mr D. Zeelie
Designation:	Director

1.4. Applicable Documents

The following documents should be read in conjunction with this EMPr, as same is applicable to the project:

- The Basic Assessment Report (BAR);
- Specialist reports that informed the Environmental Impact Assessment (EIA); and
- The Environmental Authorisation pertaining to the project, issued by the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA) *(pending)*.

1.5. EMPr Administration

Copies of this EMPr must be kept at the site office at all times. Copies thereof must be distributed to all senior contract personnel. All senior personnel involved in the construction and operation of the new development and must familiarise themselves with the content of the EMPr.

A detailed induction protocol, incorporating the conditions of the EMPr and associated Environmental Authorisation, must be developed and all contractors and future permanent staff must be subjected to stringent training on these environmental (bio-physical and socio-economic) requirements and responsibilities.

It should also be noted that the EMPr will be updated if / when the Environmental Authorisation is released, and should it contain additional mitigating measures.

2. EMPR Requirements and Report Structure

The contents of this EMPr has been compiled according to the prescribed minimum legal requirements contained in Appendix 4 of the EIA Regulations, 2014. Refer to Table 4. Additional sections have been added to the report for purposes of best environmental practice.

Table 4: Contents of EMPr

Chapter Number	Chapter Name	Requirements included in Appendix 4 of 2014 EIA Regulations
1.	Introduction	-
1.1.	Project Background and Description	- (b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description.
2.	EMPr Requirements and Report Outline	-
3.	Details of EAP	(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;
4.	Legal Framework	-
5.	General Roles and Responsibilities	- (i) an indication of the persons who will be responsible for the implementation of the impact management actions
6.	Penalties	-
7.	Reporting	(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); (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); (l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;

Chapter Number	Chapter Name	Requirements included in Appendix 4 of 2014 EIA Regulations
8.	EMPr	(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 any areas that should be avoided, including buffers;
		(d) a description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all 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;
		(e) a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d)
		(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
		(f) a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to -

Chapter Number	Chapter Name	Requirements included in Appendix 4 of 2014 EIA Regulations
		(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 provisions for rehabilitation, where applicable;

3. Details of the EAP

In terms of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998), an independent Environmental Assessment Practitioner (EAP) is responsible for the coordination of environmental studies and to present the findings of all studies and information in a Basic Assessment Report and Environmental Impact Assessment Report, which is subject to a review process by all stakeholders.

Prism Environmental Management Services (Prism EMS) has been appointed as the independent environmental consultant to conduct the Basic Assessment process for the proposed Development, in terms of the NEMA, as amended and the Environmental Impact Assessment Regulations, 2017 (as amended on 7 April 2017).

Prism is a multi-disciplinary Environmental Management consultancy, established in 2005. With a vision encompassing a holistic understanding of integrated environmental management in marriage with sustainability, the company prides itself on excellent service and value-added solutions to a range of clients / Applicants. The Prism EMS team has extensive experience in environmental impact assessment and management. The team has conducted a diverse range of impact assessments for a wide range of projects throughout South-Africa.

Prism is independent and has no vested interest in the outcome of the environmental authorization applications.

The Principle Environmental Assessment Practitioner (EAP) responsible for this project is **De Wet Botha**. De Wet holds a Master's Degree in Environmental Management from the University of Johannesburg (UJ) (former RAU). He has more than **15 years'** experience consulting in the environmental field. De Wet is a founder member of EAPASA and a member of IAIAsa and Gauteng Wetland Forum. His key focus is on strategic environmental assessment and advice, management and coordination of Environmental Impact Assessments (EIAs) and projects. The integration of environmental specialist studies into EIAs and Environmental Management Plans (EMPs) also forms part of his role. He has extensive knowledge and experience in the aquatic field, in specific wetland assessments, as well as associated Water Use Licenses (WULs). He is currently working on several Environmental Impact Assessment (EIA)'s and acts in an advisory role on major projects. He also forms part of the specialist aquatic team.

Prism EMS was appointment by the developers to attend to the required applications for environmental authorisation from the various and relevant government departments.

This Environmental Management Programme (EMPr) forms part of the submission documents in support of the Basic Assessment application and will be used for Environmental Auditing purposes throughout the construction phase of the project.

4. Legal Framework

The following environmental legislation was identified as being relevant to this project:

- National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998), amended;
- Environmental Impact Assessment Regulations, 2014 and amendments to the Listing Notices GN R 324, 325, 326 and 327 of 7 April 2017;
- National Heritage Resources Act (NHRA), 1999 (Act No. 25 of 1999); and
- National Water Act (NWA), 1998 (Act No. 36 of 1998).

Other legislation, which has been considered in the assessment of the proposed project is:

- National Environmental Management: Biodiversity Act (NEM:BA), 2004 (Act No. 10 of 2004);
- National Environmental Management: Air Quality Act (NEM:AQA), 2004 (Act No. 39 of 2004);
- Conservation of Agricultural Resources Act (CARA), 1983 (Act No. 43 of 1983); and
- Hazardous Substances Act (HAS), 1973 (Act No. 15 of 1973);

5. General Roles and Responsibilities

Although various parties are involved in the project, the most important, from an environmental responsibility perspective are the following:

- Regulatory Authorities:
- Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA)
- Applicant:
    - The Developer (Chapmans View Properties (Pty) Ltd;
    - Project Manager (Contractor).

- Independent Consultants:
    - The Environmental Control Officer (ECO); and
    - Sub-contractor(s).

5.1. Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA)

Due to the location and nature of the activity, MDARDLEA the designated authority tasked with assessing and considering the Environmental Authorisation (EA), as well as comment and possible approval of the EMPr.

Upon the granting of the EA, the Developer/Applicant will be responsible to appoint an ECO. It will be the responsibility of this ECO to assess environmental compliance of construction activities. Audit reports compiled by the ECO, as well as external audits done by an independent ECO, shall be submitted to the Department for their information and record purposes.

5.2. The Developer / Applicant

As contained in the relevant South African environmental legislation (NEMA, 1998) the Applicant / Employer is responsible and liable for the potential impact of the activities that are undertaken and is responsible for managing these impacts. The Applicant, as the employer, holds the overall environmental responsibility to ensure that the implementation of the EMPr complies with all relevant legislation, and conditions as stipulated by the EMPr.

5.3. Project Manager

The Developer / Applicant must identify a Project Manager who has overall responsibility for managing the Project Contractors and for ensuring that the environmental management requirements are met. During the construction phase, the Project Manager could be appointed as the Developer's / Applicant's construction manager; during the operations phase this role might be fulfilled by the operations manager. All decisions regarding environmental procedures and protocol must be approved by the Project Manager, who also has the authority to stop any construction activity in contravention of the EMPr.

The project manager:

- will be responsible to ensure the developer's and the contractor's responsibilities are executed on site, in terms of the relevant legislation and in compliance with the EA and EMPr.
- must appoint a suitably qualified ECO for the construction phase of the project.
- is responsible for ensuring all contractors receive a copy of this document and understand its contents.
- must be familiar with the requirements, mitigating measures and stipulations as per the relevant compliance documents.
- has the right to enforce penalties as per Section 6.
- Is responsible for any on-site decisions in respect of environmental management.
- Will be responsible for the following responsibilities, *inter alia*:
    - Ensuring that all required authorisations and permits have been obtained.
    - Reviewing and approving method statements compiled by the Contractor.
    - Assisting the Contractor in finding environmentally sensible solutions to problems, with input from the ECO where necessary.
    - Instruct the removal of persons and / or equipment not complying with the EMPr and facilitate correction of issues of non-compliance to ensure rectification.

5.4. Environmental Control Officer (ECO)

The ECO must be competent in the field of environmental management and hold at least one related qualification pertaining to interpretation and implementation of South African environmental laws, conservation or environmental management. The appointment of an ECO will remain with the developer at the start of the construction phase.

The ECO will be appointed by the developer and will undertake monthly compliance audits against the requirements of the EMPr and Environmental Authorisation.

The ECO will:

- be conversant with the requirements, stipulated mitigating measures as per the relevant compliance documents, the EMPr.
- be responsible for implementation and, through the project manager, enforcement of the conditions of this EMPr and the Environmental Specifications included herein, throughout the construction phase of the project.
- ensure that all contractors, sub-contractors and employees are fully aware of their environmental responsibilities. This will take the form of an initial environmental awareness training programme in which requirements of this document will be explained.
- monitor site activities on a regular basis to ensure that there is minimal environmental impact due to construction activities.
- Ensure regular communication between the Project Manager and the Construction Manager on site should be maintained.
- determination and enforcement of environmental “no-go” areas in consultation with site management staff and related to haul and access roads on and off-site, site storage and accommodation areas.
- ensure that a ‘hotline’ exists for reporting incidents and resolving any problems speedily.
- will have access to the site and all activities occurring thereon, with due regard for all safety requirements. The ECO shall furthermore have unrestricted authority to order restriction or control measures over any activity which is contradictory to the EMPr, the Environmental Authorisation and the mitigating measures as included in Specialist Studies, through the appropriate site management structures.
- update the EMPr as necessary and inform the relevant parties of the changes.
- conduct a final or close-out environmental audit.
- on a regular, *ad hoc*, basis will inspect the site where construction might be in progress and / or where rehabilitation of an area might have commenced.

5.5. Contractor(s)

The contractor(s) in this case refers to any sub-contractor onsite, including the building contractor(s) and various sub-contractors appointed within each phase or section of the construction of the proposed residential development. All contractor(s) employed by the developer in respect of any aspect of the construction of the proposed development, will be bound by all and any agreement between the developer and the contractor, to ensure compliance with the

Environmental Authorisation (EA), mitigating measures included in the Specialist Studies, as well as this EMPr.

The contractor will:

- take full responsibility for each of his / her employees.
- be familiar with the contents of the EMPr and the specifications contained herein;
- comply with the Environmental Specifications contained in the EMPr and subsequent revisions.
- confirm to legislative requirements for the construction works, and ensure that appropriate permissions and permits have been obtained before commencing activities;
- prepare Method Statements, programme of activities and drawings / plans for submission to the ECO when requested.
- undertake daily site inspections to monitor environmental performance and compliance with the Environmental Specifications.
- notify the ECO immediately in the event of any accident or infringements of the Environmental Specifications and ensure appropriate remedial action is taken;
- notify the ECO in advance of any activity he has reason to believe may have significant adverse environmental impacts, with specific reference to blasting, so that mitigatory measures may be implemented timeously.
- use the formats presented in this EMPr to report to the PM as to the compliance with this document.

6. Penalties

In order to ensure that there is adequate motivation for the contractor to comply with the conditions set out in the EMPr, the following applies with regards to penalties:

- Tolerance with respect to environmental matters applies during construction as well as day-to-day operations required in completing the work.
- The Contractor will comply with the environmental requirements on an ongoing basis, and any failure on their part to do so will entitle the Project Manager, in consultation with the Environmental Manager and ECO, to certify the imposition of a fine subject to the details set out in the EMPr.
- The Project Manager, Environmental Manager and any other specific personnel as designated by the Project Manager may alter the Schedule of Fines for this specific project.
- Fines may be issued per incident at the discretion of the Site Manager. Such fines will be issued in addition to any remedial costs incurred as a result of non-compliance with the

requirements of the EMPr and documents supporting thereof. Fines may be omitted from construction guarantees as supplied by the contractor.

- The Site Manager and ECO will be the judge as to what constitutes a transgression in terms of the above clause. Further, note that in the event that transgressions continue to an unacceptable level the applicant may cancel the contract.
- Where the Contractor inflicts non-repairable damage upon the environment or fails to comply with any of the environmental requirements, he will be liable to pay a penalty fine over and above any other contractual consequence. This may also lead into a Rectification Application in terms of Section 24G of the NEMA, which could lead to certain fines and / or prosecution.
- The Contractor is deemed NOT to have complied with this specification if:-
    - Within the boundaries of the site, site extensions and access roads there is evidence of contravention of the requirements of the EMPr.
    - Environmental damage ensues due to negligence.
    - The Contractor fails to respond adequately to complaints from the public.
    - Legal action is instituted against the developer in terms of Environmental laws due to any action / activities undertaken by the Contractor.
- Payment of any fines in terms of the contract will not absolve the offender from being liable from prosecution in terms of any law.
- A record of penalties will be maintained within the procurement department and may influence later commissions awarded to the contractor.
- The following, *inter alia*, represents a list of offences that could result in penalties:
    - Silt fences not installed as per EMPr where silt enters the environment unchecked and / or soil erosion is uncontrolled.
    - Insufficient sedimentation ponds which allows silt to enter the environment unchecked.
    - Inadequate and poor dust control.
    - Illegal activities.
    - On-going, repeated non-conformances.
    - Damage to no-go areas, specifically and most importantly, topsoil and the riparian buffer-zones.
    - Failure to provide adequate waste disposal certificates.

7. Reporting

7.1. Lines of Communication (Reporting)

Open and clear lines of communication shall be established and maintained between the contractor and any further parties to be appointed by the applicant (e.g. Independent ECO, etc.).

7.2. Compliance Monitoring

The contractor is to ensure that employees and all sub-contractors onsite are familiar with the requirements of the EMPr and conditions stipulated in the relevant environmental authorisations (i.e. NEMA EA) issued for the project. Therefore, the contractor should implement a management system reviewing compliance to these.

The applicant must appoint an internal, permanent ECO on site who will be monitoring the site and submitting monthly monitoring reports to the applicant.

Monitoring reports are to be sent to the relevant authorities by the Applicant/Developer or the appointed independent ECO, as per the specific requirements set in the project's environmental authorisations.

7.3. Communication with Authorities

Only the Applicant / Developer and the appointed independent ECO are to liaise with Authorities, except if the contractor must report Occupational Health and Safety incidents / accidents to the Department of Labour.

7.4. Particular Incidents

7.4.1. Incidents Reporting

The contractor is to conduct incident investigations immediately after occurrence. If an incident is identified as being a major incident, the contractor is to inform the applicant without delay.

The contractor is to ensure all employees are made aware on the relevant incident reporting procedures. The contractor must ensure that all relevant appointments are in place. An Incident Register must be kept on site and up to date at all times.

7.4.2. Legal Non-Compliance

Any legal non-compliance which may have a significant detrimental impact on the environment must be reported by the Developer / Applicant to the relevant Authority within 24 hours, unless otherwise stipulated.

7.4.3. Non-Compliance with Conditions

Any legal non-compliance that may have a significant detrimental impact on the environment with conditions stipulated in any Authorisation / License / Permit, to be reported by the applicant to the relevant Authority within 24 hours, unless otherwise stipulated.

7.5. Compliance Monitoring

Compliance monitoring will be done against, *inter alia*:

- Conditions of the EA;
- The EMPr;
- Specialist Reports;
    - Ecological Habitat Assessment
    - Wetland Assessment
    - Heritage Assessment
- Applicable Environmental Legislation:
    - National Environmental Management Act, 1998 (Act No. 107 of 1998);
    - National Heritage Resources Development Act, 1999 (Act No. 25 of 1999);
    - National Water Act, 1998 (Act No. 36 of 1998);
    - Occupational Health and Safety Act, 1993 (Act No. 85 of 1993); and
    - National Road Traffic Act, 1996 (Act No. 93 of 1996)
- Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)
    - Regulation 1031; and
- Procedures and policies prescribed and amended from time to time by the applicant.

The responsibilities in terms of **Environmental Compliance Monitoring** are as follows:

- The Developer / Applicant will be responsible for the appointment of a suitably qualified independent Environmental Control Officer (ECO) for the construction phase of the project.
- A management team must be appointed to ensure compliance with the Environmental Management Programme (EMPr) during the operational phase.
- The PM will be responsible to ensure all contractors receive a copy of this document and understand its contents.
- The ECO will ensure that all contractors / subcontractors / employees are fully aware of their environmental responsibilities.
- Contractors must ensure that all the environmental and safety precautions contained in the Environmental Authorisation, mitigating measures included in the Specialist Studies as well as this EMPr are adhered to, at all times.
- Compliance monitoring will take place by means of regular site visits and reporting by the ECO, for onwards transmission to the applicant and the relevant Government Departments (MDARDLEA and SAHRA) for their information and record keeping.

8. Environmental Management Programme (EMPr)

8.1. Description of Receiving Environment

The study site is located in quaternary catchment B20G in the Olifants catchment (WMA 2). The study area falls within the Grassland Biome (Biome 06), and the Highveld Level-1 Ecoregion (Ecoregion 11) (Kleynhans *et al*., 2005).

The study area is surrounded by mixed-land uses (residential, agricultural, industrial, quarrying, power station (Kusile) etc.).

Ecological Habitat Assessment

Twenty-one (21) bird species were recorded in the study area during the March 2018 survey based on either direct observations, or the presence of visual tracks & signs. No bird SCC was recorded during the survey.

Overall, mammal diversity in the study area was moderate, no mammal species were observed but four (4) mammals were recorded during the March 2018 survey based on the presence of visual tracks & signs. One SCC, namely *Aonyx capensis* (Cape Clawless Otter) was confirmed via tracks.

No reptile species were recorded in the study area during the March 2018 survey.

Two (2) amphibian species was recorded in the study area during the March 2018 survey based from calls made by the frog species.

During the rapid field survey, the current impacts that are having a negative impact on the area were identified, and are listed below;

- Presence of alien and invasive plant species;
- Existing disturbance of vegetation;
- Presence of livestock grazing within the area;
- Adjacent road with the associated constant disturbance, road mortalities and litter; and
- Powerlines within the vicinity of the study area.

It is clear from the regional ecological overview, as well as the baseline data collected that the study area has been somewhat altered (historically and currently). The previous agriculture as well as

the recent disturbance will require at least 5 years to recover to a better, more natural ecological state.

However, despite these impacts, the remaining natural habitats (including secondary grassland and stream habitats) (surveyed, but mainly located outside the study area / footprint of the proposed development), exhibited a healthy balance between various common grassland species and associated herbaceous plants. The ecological integrity, importance and functioning of the secondary grassland area is not as functional as the stream which is a water resource system as well as crucial habitat for various fauna and flora, for example the Cape Clawless Otter. This diversity is indicative of the importance of these systems to collectively provide refuge, food and corridors for dispersal in and through the surrounding area.

The following further conclusions were reached based on the results of this assessment (these conclusions are limited due to the unknown extent and type of development which is proposed for the study area):

- The study area is identified as Heavily Modified, with the surrounding area moderately modified;
- Based on the National Biodiversity Assessment (NBA, 2012) the study area overlaps largely with ecosystems that are listed as Vulnerable (VU);
- Most of the terrestrial ecosystems associated with the development are rated as not protected;
- Based on the SANBI (2010) Protected Areas Map and the National Protected Areas Expansion Strategy (NPAES) the study area does not overlap with any formally or informally protected area;
- The study area does overlap with certain wetland areas and one perennial stream. The stream area is not classified as an NFEPA area;
- The study area is situated within one vegetation type; the Eastern Highveld Grassland (Gm12) which is listed as an Endangered (EN) vegetation type according to Mucina & Rutherford (2006);
- Based on the Plants of Southern Africa (BODATSA-POSA, 2016) database, 159 plant species are expected to occur in the study area, of these no species are listed as being Species of Conservation Concern (SCC);
- Based on the South African Bird Atlas project, Version 2 (SABAP2) database, 337 bird species are expected to occur near the study area. Of the expected bird species, twenty-two (22) species (6.52%) are listed as SCC either on a regional (19) or global scale (3);
- Six (6) Category 1b invasive species were recorded at the site and must therefore be removed by implementing an alien invasive plant management programme;

- Twenty-one (21) bird species were recorded in the study area during the March 2018 survey;
- Overall, mammal diversity in the study area was considered moderate, with four (4) mammal species being recorded during the March 2018 survey based on the presence of visual tracks & signs;
- No reptile species were recorded in the study area during the March 2018 survey. Two (2) amphibian species was recorded in the study area during the March 2018 survey;
- Assessment of significance of the construction phase regarding further loss and fragmentation of the vegetation community and further displacement of faunal community due to habitat loss and disturbance was rated as moderate pre-mitigation, and low post-mitigation; and
- Assessment of significance of the operational phase regarding encroachment and displacement of indigenous vegetation community by alien invasive plant species, infringement by humans into the grassland, the ongoing displacement and fragmentation of faunal community was rated as moderate pre-mitigation, and low post-mitigation.

Wetland Assessment

The field investigations concluded that no wetland is present on the study area. A wetland was recorded in proximity to the development site (150m away), but no direct impact is envisaged.

Concluded from the results of the assessment, the construction activities will not directly impact on the wetland system. Possible impacts can be mitigated to satisfactory standards if all mitigatory actions are implemented with due care. It is key to preserve water quality and supply to the downstream aquatic resources. For this reason, it can be supported that the development may go-ahead if the required buffers are maintained and the resource drivers preserved. The stormwater management is vital to ensure sustainable functionality of the adjacent wetland.

The wetland drivers must be sustained during the development, especially during the construction period. In respect of the construction phase, it is important to ensure that the required erosion protection measures be implemented to avoid silt entering the system and that good water quality be maintained in the system.

Figure 2: Site Sensitivity Map

8.2. Key Objectives of the EMPr

- To mitigate any possible negative impacts identified in the EMPr for the construction and operational phases of the proposed development;
- To minimise the area of disturbance by demarcating the construction and green zone areas;
- Preserve flora and fauna;
- Preserve topsoil for optimal rehabilitation and landscaping following construction;
- To ensure effective communication with stakeholders and regulatory authorities;
- To ensure good housekeeping practices and general neatness on site;
- To monitor the construction activities in terms of the EMPr and approved designs;
- To manage and control the formation of erosion;
- Control pollution to the receiving environment, both during the construction and operational phases;
- To ensure that environmental awareness programmes are enforced throughout the construction phase; and
- The timeframes for site audits are suggested as follows:
    - Site establishment phase – daily audits.
    - Construction phase – weekly site visits, bi-weekly reports and monthly compliance audits. Construction closure audit is required prior to the operational phase
    - Decommissioning phase – site closure audit to be conducted.
- Following each site visit an audit report must be compiled to relay any non-compliance issues that need to be addressed, as well as compliance matters.

8.3. Environmental Awareness Plan

Training aims to create an understanding of environmental management obligations and prescriptive measures governing the execution of the project. It is generally geared towards project team members that require a higher-level of appreciation of the environmental management context and implementation framework for the project. In contrast, **Environmental Awareness Creation** strives to foster a general attentiveness amongst the construction workforce to sensitive environmental features and an understanding of implementing environmental best practices. The Environmental Awareness Plan for the Water Park incorporates both training and environmental awareness to ensure that the proposed development is implemented in line with the requirements of the EMPr and that environmental sensitivities on site are managed correctly.

As part of this, the Applicant is committed to remaining responsible and accountable for environmental practices on site. Being accountable for environmental practices undertaken during working tasks and activities remain the responsibility of both employer and employee awareness of the potential environmental impacts that could result from these activities.

All potential incidents to the environment may be effectively minimised through effective training and awareness of the employees using any of the following methods:

- Supervisory meetings (weekly);
- Induction training (annually); and
- EMP Training (annually).
-

These methods are discussed below in more detail.

8.3.1. Meetings

Weekly supervisory meetings are ideal to facilitate awareness of specific environmental dangers pertaining to each week. Various topics may be discussed during these meetings and must be recorded or logged. All attendees at each meeting must sign an attendance register, these records must be kept on file at the administration office. Topics for discussion may include:

- Topics applicable to the entire operation;
- Area specific topics (e.g. wetland); and
- General environmental awareness:
    - Waste management
    - Spillages
    - Saving water
    - Electricity consumption
    - Dust control
    - Noise generation
    - Housekeeping
    - Indigenous Vegetation
    - Alien vegetation
    - Fire-making

Should issues be identified by the ECO, these can also be addressed during these weekly meetings.

8.3.2. EMPr Training

Aspects of the EMPr must be selected and discussed at training workshops at least annually. Such training topics may be focused around the incidents that are frequently reported during the previous year and may be focused around the following:

- Hydrocarbon spillages;
- Stormwater Control;
- Waste Management;
- Monitoring Protocols; and
- Safety topics.

8.3.3. Induction Training

All new employees are required to undergo induction training prior to commencement of work. Returning and existing employees must undergo repeat induction training at least annually. Environmental awareness training must form part of the induction and must include the basic topics relating to the environment:

- Main environmental legislation (e.g. NEM:WA[1] or NWA[2]);
- Constitutional right pertaining to the environment;
- Waste Management hierarchy;
- Environmental, social and economic concerns;
- Sensitive environmental features; and
- Prevention of poaching/fishing.

[1] National Environmental Management Waste Act (NEM:WA), 2008 (Act No. 59 of 2008)
[2] National Water Act (NWA), 1998, (Act No. 36 of 1998)

8.4. Impact Mitigation Measures – Construction Phase

8.4.1. Primary Overarching Impacts

Table 4:Site Camp Establishment

Activity	Mitigating Measure	Responsible Party
General Site Camp Establishment	1. Site establishment is to be undertaken within a demarcated area. 2. Camps must not be established within any 1:100-year floodline areas or within the environmentally sensitive areas / buffers as indicated by the Ecologist specialist (Figure 2). 3. No accommodation for workforce onsite, except a security presence. 4. Open fires are prohibited onsite. 5. No smoking allowed outside of designated areas. 6. Erosion protection measures should be linked to the crossing section and carefully designed and installed.	Contractor / ECO
Facilities at the Site Camp	1. Potable water must be made readily available to all construction staff. 2. Chemical toilets must be made available within the site camp. 3. Chemical toilets are to be provided by the Contractor, at a ratio of 1:10. 4. Chemical toilets must be erected within 100m from all workplaces outside buffer areas. 5. Chemical toilets are to be secured to the ground and must have a closing mechanism. 6. Toilet paper must be provided at these facilities. 7. Certified contractors to maintain and remove chemical toilets regularly, at least once weekly. 8. The contractor must ensure that leaks and spillage do not occur when toilets are cleaned / serviced	Contractor Contractor

Activity	Mitigating Measure	Responsible Party
	9. Discharge and disposal of waste into the environment and / or burial of waste are strictly prohibited. 10. Dedicated wash areas to be situated at least 100m away from buffer areas may be utilised. 11. Areas demarcated for eating must be cleaned on a daily basis, to ensure the highest possible standard of hygiene. 12. Washing must be done in an area designated as a washing area. 13. Wash water must be diverted to the oil trap	
Surrounding / adjacent Private Properties	1. Maintain an open channel of communication for surrounding stakeholders to raise comments and concerns by having a complaint register onsite. 2. Trespassing onto adjoining properties is prohibited at all times. 3. Damages affected to any private or public property must be repaired immediately and to the satisfaction of the owner. 4. Wastewater may not be discharged freely off site (surrounding streets or into naturally vegetated areas). 5. No littering may take place on the adjacent properties.	Contractor
Workshop Area	1. A method statement for 'workshop maintenance and cleaning of plant' must be prepared. 2. All vehicle and / or equipment maintenance must be done in the workshop area, equipped with a bund wall and grease trap oil separator. 3. Any spills from the workshop area must be cleaned immediately and remediated to the satisfaction of the ECO and PM. 4. Emergency spill kits must be available on site at all times.	Contractor / ECO

Table 5: Environmental Training

Activity	Mitigating Measure	Responsible Party
General training of all staff on site	1. Environmental awareness training is to be provided to all persons working on site (Toolbox talks, demo's and/or media attention). 2. Topics to be covered include, *inter alia*: • Reason for conservation and protection of the environment (EMPr objectives) • Identified impacts of construction activities on the environment. • Mitigation measures (as contained in Section 6 of EMPr) in respect of these impacts. • Emergency spills, awareness thereof and response there to. • Hydrocarbon spills and clean-up procedures. • Potential environmental emergencies. • Various sections of the EMPr. • Roles and Responsibilities. 3. Attendance registers and training material must be filed for every session. 4. Training must be given prior to commencement of construction regarding safety for dealing with wild animals such as snakes, scorpions etc.	ECO/PM/Contractor

Table 6: Fauna and Flora Management

Activity	Mitigating Measure	Responsible Party
General Fauna and Flora Management at the construction site	1. As far as possible, the proposed developments should be placed in areas that have already been disturbed, and no further loss of secondary grassland should be permitted. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon (including fencing off the defined project area); and 2. Areas of indigenous vegetation, even secondary communities should under no circumstances be fragmented or disturbed further or used as an area for dumping of waste; 3. The areas rated as highly sensitive in the Project area as defined in this report should be declared a 'no-go' area during the construction and operational phases and all efforts must be made to prevent access to this area from construction workers, machinery and the general public; 4. These areas should be clearly demarcated and all access to the adjoining areas should be restricted; 5. All laydown, storage areas etc should be restricted to within the Project area and all access roads must be kept within this area or from existing access roads; 6. A qualified environmental control officer must be on site when construction begins to identify species that will be directly disturbed and to relocate fauna/flora that is found during construction (including all reptiles and amphibians); 7. Areas of indigenous vegetation should be delineated, and rehabilitation measures implemented in areas where the indigenous community is still present but degraded;	Contractor

Activity	Mitigating Measure	Responsible Party
General Fauna and Flora Management at the construction site *(continued)*	8. Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species; and 9. Compilation of and implementation of an alien vegetation management plan for the entire site. 10. If any faunal species are recorded during construction, activities should temporarily cease, and an appropriate specialist should be consulted to identify the correct course of action; 11. Fencing should be erected around the Project area to prevent workers and members of the public from entering the surrounding farm portion. This fence should have small openings to allow wildlife to pass through; 12. Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site 13. No trapping, killing or poisoning of any wildlife should be allowed on site; 14. Adequate signage should be erected that raises awareness about possible fauna in the area (e.g. amphibians) and speed bumps should be put in place to reduce speeding and faunal road mortalities; 15. Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during the construction process. The intentional killing of any animals including snakes, insects, lizards, birds or other animals should be strictly prohibited; and 16. All livestock must be kept out of all grassland and wetland area in order to prevent overgrazing of remaining grassland; and 17. All domesticated animals are forbidden within the entire Project area.	Contractor / ECO

Activity	Mitigating Measure	Responsible Party
	18. Cement slabs, paving and other hard surfaces will only be removed if specifically instructed to. 19. Areas not earmarked for construction activities must be clearly demarcated with barrier tape, or similar to prevent vehicular movement in these areas. 20. Areas that require vegetation clearance must be undertaken in accordance with the ECO to ensure biodiversity is maintained and sensitive areas not disturbed. 21. Prior to the start of construction, woody vegetation matter shall be stripped, collected and disposed of at an authorised disposal site. 22. Alien, invasive species found within the construction area should be eradicated as far as possible and disposed of at an authorised disposal site. 23. No trees / vegetation outside the construction area to be damaged / removed in any manner, for any reason. 24. Non-invasive indigenous flora should be used where required. 25. Cleared wood / vegetation is prohibited from being used as burning wood or for any other purpose. 26. Demarcated areas identified as no-go areas should be maintained, under consultation with the ECO. 27. The feeding or leaving of food for stray or wild animals in the area is strictly prohibited. 28. No animals may be hunted, trapped, disturbed or poached. 29. Identified nesting and breeding sites for birds and mammals must be avoided at all costs. 30. Should fauna be encountered during site clearance or during construction activities, earthworks shall cease immediately, until such fauna have been safely relocated.	

Activity	Mitigating Measure	Responsible Party
	31. Photographs of sensitive plants and animals must be displayed in the construction camp to heighten awareness.	

Table 7: Soils

Activity	Mitigating Measure	Responsible Party
Topsoil	1. A methodology sketch plan of the working areas for the storage of topsoil, movement of plant and subsoil storage must be approved prior to construction. 2. The ECO must document the management of topsoil via photographic evidence during the construction phase. 3. Stockpiles must not exceed 2m in height and contained. 4. All topsoil must be removed and stockpiled on site at a height not exceeding 1,5m to ensure that microbial activity and other biota within the topsoil mass, remain viable. 5. Stripping and stockpiling must not occur during rainfall to prevent compaction. 6. The slopes of soil stockpiles shall not have a vertical / horizontal gradient exceeding 1:1.5. 7. Clearance of topsoil to be done immediately prior to work commencing in the subject area. 8. Topsoil should not mix with construction rubble and no vehicle movement is allowed onto or in the area immediately surrounding the stockpiles. 9. Under no circumstances must topsoil and subsoil be mixed during stripping. 10. Ripping must be done at 250mm in 2 directions, at right angles. Topsoil must be placed in the same soil zone from which it has been stripped. 11. Topsoil stockpiles must be monitored for invasive exotic vegetation growth. 12. Remediation, where required to be done in consultation with the ECO. 13. Stockpiles are to be stabilised if signs of erosion are visible. 14. Stockpiles must not be handled more than twice, once for piling and a second time for rehabilitation.	Contractor

Activity	Mitigating Measure	Responsible Party
Topsoil *(continued)*	15. Dust suppression on stockpiles older than 2 months is required, with either water or biodegradable chemical agent.	Contractor
Soil Erosion	1. Instability and erosion of steep slopes must be stabilised immediately. Re-vegetation in consultation with landscape architect and ECO should be done if required. 2. To reduce the loss of material by erosion, disturbance must be kept to a minimum. 3. If clearing of slopes occur within the rainy season, earth berms must be created along the up-slope side of the construction area. 4. Where possible, natural vegetation should be retained to reduce the risk of erosion. 5. Should erosion occur due to negligence on the part of the Contractor to apply the above measures, the Contractor will be responsible for reinstatement of the eroded area to its former state at his own expense. Any surface-water pollution occurring as a result of this negligence will be cleaned up by the Contractor or a nominated clean up organisation at the expenses of the Contractor.	Contractor / ECO

Table 8: Stormwater and other watercourses found on site

Activity	Mitigating Measure	Responsible Party
Stormwater Management	1. Runoff from the construction areas must be controlled and directed away from the wetlands; 2. On site storm water management, must be implemented 3. The proposed activities must be initiated and constructed in such a way to prevent the reduction of natural water flow into the wetland and downstream which, in essence, is the driving factor in terms of water provision. 4. An approved stormwater management plan must be implemented. 5. The design of stormwater management system should be based on Sustainable Urban Drainage Systems (SUDS) and Water Sensitive Urban Design approach (WSUDS) which enhance natural drainage through permeable surfacing and which integrate landscaping with stormwater in line with best practice stormwater management 6. Stormwater should be allowed to drain into the area that it originally fell on to, as far as possible to retain the original orientation. 7. Increased run-off during construction should be managed using berms, temporary cut-off drains, attenuation ponds or other suitable structures, in consultation with the ECO and resident Engineer. 8. Cut off drains may not cause additional harm to environment. Care must be taken to consider their position and the receiving environment. he Contractor is to ensure that excessive amounts of sand, silt and silt-	Contractor

Activity	Mitigating Measure	Responsible Party
Stormwater Management (*continued*)	laden water do not enter the stormwater system and / or natural watercourses found along the length of the construction line. 9. Run-off containing high sedimentation loads must not be released into natural or municipal drainage systems. 10. Silt fences must be used to stabilise the site, reduce erosion and silt entering the natural environment. No unchecked silt may enter the natural environment. 11. Silt fences must be fit for purpose, effective and regularly maintained. 12. The contractor must submit a methodology statement for approval by the ECO and Project Manager prior to starting work for the installation of silt fences. 13. Stormwater management system is to be installed as soon as possible following site establishment, to attenuate stormwater during the construction phase, as well as during the operational phase (if applicable). 14. Surface- and stormwater to be directed away from trenches and areas of excavation.	Contractor

Table 9: Sites/Buildings of Cultural or Heritage Value

Activity	Mitigating Measure	Responsible Party
Unearthing of Artefacts	1. If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. 2. It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area. 3. The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.	Contractor
Paleontological protocol for finds.	1. In the unlikely event of fossil discovery, a professional palaeontologist must be called in to confirm and record the finds. Ex situ remains must be wrapped in paper towels or heavy-duty tin foil and stored in a safe place. The material should not be washed or cleaned in any way. In situ material must be kept in place and protected from further damage by covering it with light but rigid object like a box, bucket or metal sheet until further confirmation by the palaeontologist	
Protection of natural features	1. Prohibit painting, defacing, marking or damage of nature features i.e. rock formations to occur.	Contractor

Table 10: Waste Management

Activity	Mitigating Measure	Responsible Party
Solid Waste and Waste Management	1. Compile a waste management plan: a. Areas where waste bins are to be provided, will be identified. b. Waste bins will be provided at all eating areas, office containers {on site and at the site camp, storage containers, small plant store, flammable and chemical store, employee camp (compound) and at the entrance gate (security guard shelter)}. c. An adequate number of waste bins will be provided for the site. d. The amount of waste bins on site will increase to correspond with the rising number of employees as the contract progresses. e. Waste bins will be of a weatherproof type (prevent rain from penetrating the bin), have a lid to prevent wind and animals access to the waste. 2. Area as identified in consultation with the ECO onsite will be utilised for the temporary management of various waste streams, i.e. general refuse, construction waste (wood and metals scrap) and contaminated waste. Location of such areas will seek to minimise the potential for impact on the surrounding environment, including prevention of contaminated runoff, seepage and vermin control. 3. Where possible, construction and general waste on-site will be reused or recycled. Bins and skips will be available on-site for collection, separation and storage of waste streams (such as wood, metals, general refuse, plastic, paper etc.) A recycling plan will be developed. Hydrocarbon waste will be contained and stored in sealed containers within an appropriately bunded area and disposed / recycled at a registered hazardous waste site facility.	Contractor

Activity	Mitigating Measure	Responsible Party
Solid Waste and Waste Management *(continued)*	4. Hazardous waste and surplus dangerous goods will be kept to a minimum and will be transported by approved waste transporters to sites designated for their disposal. 5. Uncontaminated waste will be removed at least weekly for disposal; other wastes will be removed for recycling / disposal at an appropriate frequency. 6. All solid waste shall be disposed of by a certified contractor, off-site, at a registered landfill site. The Contractor shall supply the ECO with a certificate of disposal for auditing purposes. 7. The mixing of general waste and hazardous materials is not permitted. Waste separation needs to occur before waste is placed in waste skips. 8. Litter (from outside the camp included) and concrete bags etc. must be collected and put into suitable closed bins on a daily basis. 9. Construction rubble must be disposed of at an authorised disposal site. 10. General wastewater on site to be collected and disposed of at a registered communal facility. 11. Waste to be disposed of at an authorised landfill site. 12. The area will be bermed to prevent dispersal by wind and rain. 13. Waste certificates will be kept on record. 14. Hazardous waste to be removed by certified waste contractor. A copy of the certificate of registration of hazardous waste transporter to be kept onsite and occurrences of collection on file.	

Table 11: Health and Safety

Activity	Mitigating Measure	Responsible Party
Safety of Workers on Site	1. The Contractor must provide a method statement for 'Safety Measures', 'Standard Operating Procedures', and 'First Aid' to be adhered to on site. 2. A Health and Safety Plan (in terms of the OHSA, 1993) must be compiled and must be available on site, at all times. 3. An Incident Record of Health and Safety incidents must be kept on site and up to date. 4. Incidents must be reported to the ECO and the PM immediately. 5. Machinery and equipment must be maintained in a safe operating condition. 6. A First Aid Kit must be available at every site, where work / construction is in progress. A First Aid Representative should also be available. 7. Stockpiled material to be secure to prevent injury. 8. Personal Protective Equipment (PPE) must be made available to all construction workers and must be compulsory. 9. Hard hats and safety shoes must be worn at all times. 10. Dust masks and ear plugs as and when required. 11. No person must be allowed to enter the site without the required PPE. 12. Regular noise spot sampling should be undertaken in areas where construction is taking place to ensure that the noise levels are within required limits.	Contractor
Safety of Work Area	1. Trenches, uncovered manholes and other excavated areas must be cordoned off and clearly demarcated. 2. Warning signs must be adequate and clearly visible to inform of hazardous areas.	Contractor

Activity	Mitigating Measure	Responsible Party
	3. Firefighting equipment must be placed in prominent positions and must be distributed over the entire site. 4. Fire Hydrants must be in full, working condition and must include fire extinguishers, a sand buckets and fire beaters, if required and needed. 5. Emergency contact numbers for all Emergency services must be available and prominently displayed on a signage board that is clearly visible. 6. Each site responsible person to have the necessary emergency contact numbers on hand.	

Table 12: Construction Materials and Hazardous Materials (Hazmat)

Activity	Mitigating Measure	Responsible Party
Fuel, Oil and Chemicals	1. The Contractor must provide method statements for the 'Handling and Storage of Oil and Chemicals', 'Fire' and 'Emergency Spill Procedures'. 2. Staff who will be handling Hazmat must be trained to do so responsibly. 3. Fuel, Oil and Chemicals must be confined to specific and secured areas within the construction camp, in terms of and as per specifications of the OHSA, 1993. 4. Confinement areas (at construction camp) must be imperviously bunded with adequate containment to prevent pollution, even during periods of high rainfall. 5. Storage tanks earmarked to store chemicals or hydrocarbons must be placed in bunded areas and capacity must be 110% the total volume of the hazardous product to be stored. 6. Empty (used) cement bags must be collected and stored in weatherproof containers. 7. Hydrocarbon spills will be treated in situ by means of a spill kit. 8. Any major hydrocarbon spills should be reported to the MDARDLEA and DWS and a remediation plan should be submitted within 24 hours or as instructed by the regulatory authority. 9. Contaminated soils will be treated as hazardous up until such time as these have been remediated. 10. All areas earmarked for storage of chemicals and / or hydrocarbons will be clearly marked and SDS's will be available. 11. No vehicle maintenance may take place on site; only in designated areas. 12. Drip trays must be placed under all vehicles when immobile.	Contractor

Activity	Mitigating Measure	Responsible Party
Fuel, Oil and Chemicals *(continued)*	13. Drip trays must be of a sufficient size and volume to catch any hydrocarbons that might leak from a stationary vehicle. 14. Spill kits must be available on site and in all vehicles that transport hydrocarbons for dispensing to other vehicles on the construction site. 15. Spilled substances must be contained in impermeable containers for removal to a licensed hazardous waste disposal area. 16. Contaminated wastewater to be contained. 17. Significant spills should be reported to the PM or CM who should report this to the relevant authority.	
Building Materials	1. Portland cement or white cement is considered a “hazardous chemical” under OHSA, Act 85 of 1993 Reg. 1179. Cement should not be allowed to spread to the surrounding environment. 2. Cement, concrete and chemicals must be mixed on an impermeable surface to prevent contamination of the receiving environment. 3. Provisions to contain spills onto soil must be made. 4. Runoff from batching areas shall be strictly controlled, and water containing cement-residue shall be collected, stored and disposed of at registered disposal site. 5. Contaminated soil must be contained and disposed of off-site at a registered landfill site. 6. Storage tanks earmarked to store hazmat must be placed in bunded areas and capacity must be 110% the total volume of the hazardous product to be stored.	Contractor

Activity	Mitigating Measure	Responsible Party
Building Materials *(continued)*	7. Empty (used) cement bags must be collected and stored in weatherproof containers to prevent air pollution by cement dust and water contamination through stormwater run-off.	

Table 13: Safety and Security

Activity	Mitigating Measure	Responsible Party
Security and Safety	1. Security personnel and skeleton staff will be housed on site, unless it is authorised in the Environmental Authorisation for site staff. 2. Prohibit the usage of alcohol on site. 3. Prevent casual entrance into the works area 4. Cordon off the works area with a boundary fence. 5. ECO and Contractor to ensure that only authorised personnel are on site at all times.	Contractor

Table 14: Noise

Activity	Mitigating Measure	Responsible Party
Construction Activities	1. Noise levels shall be limited with due care to residents in urban, peri-urban and rural areas, as well as workers in the industrial area. Incidences to be reported in the complaints register. 2. Silencer units on plant and vehicles shall be maintained in good working order. 3. All construction equipment, including vehicles, will be properly and appropriately maintained in order to minimise noise generation. 4. Operations must be restricted to hours of 06:00 and 18:00 on weekdays to prevent undue noise disturbance.	Contractor

Activity	Mitigating Measure	Responsible Party
	5. Construction noise will be managed according to the Noise Control Regulations and SANS 10103.	

Table 15: Vehicles & Access

Activity	Mitigating Measure	Responsible Party
Smoke, Dust and Gasses Control	1. A speed limit of 20km/h to be maintained on all dirt roads. 2. Dust suppression by means of either water or biodegradable chemical agent is required. 3. The first dampening must commence with the start of work daily and the second watering to commence no longer than four hours later. During exceptional circumstances additional dampening may be required should the watering not be deemed effective by the ECO. The ECO will determine the nuisance and health issues in considering this recommendation. 4. Haul vehicles moving outside the construction site carrying material that can be wind-blown will be covered. 5. All vehicles and other plant should comply with road worthy requirements and comply with legislation in terms of allowable emissions. 6. All reasonable measures should be taken to minimize air emissions in the form of smoke, dust and gases. Burning or incineration of any material on-site will be prohibited.	Contractor

Activity	Mitigating Measure	Responsible Party
Site Roads and Access	1. Routes for temporary access, lay down areas, turning areas, additional soil storages outside of the working strip and haul roads shall be located within prior approved demarcated areas and vehicle movement shall be confined to these roads and areas. 2. Movement of vehicles outside the designated working areas shall not be permitted without approval from the ECO. 3. Access to the site shall be controlled and restricted to the contractor. 4. Planning of temporary access roads to the site, over areas that need to be cleared to facilitate same, must be done in conjunction with the ECO, the PM and the land owner. 5. Authorised clearing of access roads must be done under the supervision of the ECO. 6. Access roads for earthmoving equipment must be clearly demarcated and positioned as close as possible to the proposed construction area. 7. No driving off the marked roads is permitted, and designated parking areas must be identified and demarcated with applicable signage. 8. Neither the site nor the access roads must be allowed to be used for recreational activities. 9. Should construction vehicle traffic lead to compacting of soil, soil must be deep ripped to loosen compacted layers. 10. Designated access to the proposed site will be created to ensure safe entry and exit. 11. Signage will be established at appropriate points warning of turning traffic and the construction site (all signage to be in accordance with prescribed standards).	Contractor / ECO / PM

Activity	Mitigating Measure	Responsible Party
Site Roads and Access *(continued)*	12. All vehicles travelling on public roads will adhere to the specified speed limits and all drivers will be in possession of an appropriate valid driver's license.	Contractor / ECO / PM

Table 16: Social Environment

Activity	Mitigating Measure	Responsible Party
Local Community	1. Road rehabilitation should take place as and when required, to ensure minimum inconvenience to other road users (where applicable). 2. Construction vehicles are to use only the designated roads. 3. Damage to infrastructure shall not be tolerated and damage is to be repaired immediately. 4. The Contractor shall assist the PM with responding to queries and complaints from the public by: a. documenting details and submitting the information to the PM for inclusion in the complaints register; b. bringing any such matters to the attention of the PM immediately as they arise and taking any remedial action as per the PM's instruction. 5. Any work on landowner property that is not within the approved working area, must have a written agreement from the landowner concerned. These agreements may not allow for illegal activities such as borrow pits, creation of dams etc.; 6. All disturbance areas to be rehabilitated. 7. A Public Complaints register will be kept on site for any public complaints and updated frequently.	Contractor / PM

Activity	Mitigating Measure	Responsible Party
Workforce	1. Local residents (including females) are to be offered unskilled job opportunities where possible. 2. Workers will have a formalised forum through which they can make inputs into the overall management of the project (e.g. a workplace committee).	Contractor / ECO / PM

Table 17: Recommendations by Heritage Specialist (Refer to Appendix 6 of Basic Assessment Report)

Activity	Mitigating Measure	Responsible Party
During the construction phase activities resulting in disturbance of surfaces and / or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects or palaeontological finds.	1. A Chance Find Procedure# should be incorporated into the EMPr should any sites be identified during the construction process. 2. If any graves are in discovered they should ideally be preserved in-situ or alternatively relocated according to existing legislation. 3. Implementation of a palaeontological protocol for finds*.	Contractor / ECO

Chance Find Procedures#

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped, and a qualified archaeologist must be contacted for an assessment of the find and therefor chance find procedures should be put in place. A short summary of chance find procedures is discussed below. This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

Palaeontological protocol for finds*

In the unlikely event of fossil discovery, a professional palaeontologist must be called in to confirm and record the finds. Ex situ remains must be wrapped in paper towels or heavy-duty tin foil and stored in a safe place. The material should not be washed or cleaned in any way. In situ material must be kept in place and protected from further damage by covering it with light but rigid object like a box, bucket or metal sheet until further confirmation by the palaeontologist.

Table 18: Recommendations by Ecological Specialist (Refer to Appendix 6 of Basic Assessment Report)

Activity	Mitigating Measure	Responsible Party
Infringement by humans into the grassland as the community grows and more areas are impacted. Continued encroachment and displacement of indigenous vegetation community by alien invasive plant species due to construction and operational activities.	***Mitigation Measures for Impacts on Vegetation Communities*** 1. As far as possible, the proposed development should be placed in areas that have already been disturbed, and no further loss of secondary grassland should be permitted. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon (including fencing off the defined project area); and 2. Areas of indigenous vegetation, even secondary communities should under no circumstances be fragmented or disturbed further or used as an area for dumping of waste; 3. The areas rated as highly sensitive (Figure 2) should be declared a 'no-go' area during the construction and operational phases and all efforts must be made to prevent access to this area from construction workers, machinery and the general public; These areas should be clearly demarcated and all access to the adjoining areas should be restricted; 4. All laydown, storage areas etc should be restricted to within the study area and all access roads must be kept within this area or from existing access roads; 5. A qualified environmental control officer must be on site when construction begins to identify species that will be directly disturbed and to relocate fauna/flora that is found during construction (including all reptiles and amphibians); 6. Areas of indigenous vegetation should be delineated, and rehabilitation measures implemented in areas where the indigenous community is still present but degraded;	Contractor / ECO

Activity	Mitigating Measure	Responsible Party
	7. Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species; and 8. Compilation of and implementation of an alien vegetation management plan for the entire site. ***Mitigation Measures for Impacts on Faunal Communities*** 1. If any faunal species are recorded during construction, activities should temporarily cease, and an appropriate specialist should be consulted to identify the correct course of action; 2. Fencing should be erected around the study area to prevent workers and members of the public from entering the surrounding farm portion. This fence should have small openings to allow wildlife to pass through; 3. Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site 4. No trapping, killing or poisoning of any wildlife should be allowed on site; 5. Adequate signage should be erected that raises awareness about possible fauna in the area (e.g. amphibians) and speed bumps should be put in place to reduce speeding and faunal road mortalities; 6. Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during the construction process. The intentional killing of any animals including snakes, insects, lizards, birds or other animals should be strictly prohibited; and	

Activity	Mitigating Measure	Responsible Party
	7. All livestock must be kept out of all grassland and wetland area in order to prevent overgrazing of remaining grassland; and 8. All domesticated animals are forbidden within the entire Project area.	

Table 19: Recommendations by Wetland Specialist (Refer to Appendix 6 of Basic Assessment Report)

Activity	Mitigating Measure	Responsible Party
Poor stormwater management during the construction and operational phases causing sedimentation and contamination of runoff. Stockpiling Storage of hydrocarbons Waste generation Sewage treatment	**Mitigation:** 1. Runoff from the construction areas must be controlled and directed away from the wetlands; 2. On site storm water management, must be implemented; 3. The proposed activities must be initiated and constructed in such a way to prevent the reduction of natural water flow into the wetland and downstream which is the driving factor in terms of water provision; and 4. An approved stormwater management plan must be implemented. **Monitoring:** 1. The wetland monitoring occurring on a quarterly basis should be conducted by a skilled professional qualified in assessing and understanding the complex nature of wetlands and their associated drivers; 2. It should be attempted to preserve complete wetland function (current status) if at all possible. 3. Wetland drivers should be protected.	Contractor / ECO

8.5. Impact Mitigation Measures – Operational Phase

Table 20: General

Activity	Mitigating Measure	Responsible Party
Operational phase of Development	1. A weed eradication programme shall be maintained and enforced on site, which could include pulling, cutting, targeted pesticide use, biological controls and native species reintroduction. 2. Use of “migratory friendly” property borders, such as palisade fencing or wire fencing with large gaps this free movement corridors for small animals should be retained throughout the operational phase. 3. It is recommended that the natural grassland vegetation is conserved in open landscaped gardens; 4. Retain natural vegetation as landscaped gardens; 5. Proper PPE should be used during the use of chemical pesticides. 6. Local employment will be preferred to undertake and implement the weed eradication programme. 7. The design and stormwater management of the development will allow for natural runoff to the aquatic resources as far as practically possible. 8. The Stormwater Management System will be maintained to ensure its effectiveness. 9. Disposal of runoff or stormwater to the municipal system will be undertaken in accordance with the requirements of the local by-laws.	Facility Manager

8.6. Impact Mitigating Measures – Decommissioning Phase

Table 21: Construction Site

Activity	Mitigating Measure	Responsible Party
Camp de-commissioning (associated infrastructure)	1. All rubble to be removed from the site and disposed of at a registered landfill site. 2. All rubbish / litter to be collected. 3. Surfaces to be checked for waste activities such as cement mixing and cleared as per instruction from the ECO. 4. Building / construction material not utilised to be removed off-site. 5. All natural surfaces hardened or compacted due to construction activities to be ripped and foreign material removed. 6. Sensitive areas are to be checked to ensure same is clean from litter, rubbish, and construction or waste materials. 7. All fences, demarcation barriers and signs associated with construction to be removed. 8. Residual stockpiles, following spreading of same over areas affected by construction for rehabilitation purposes, to be spread on site, as directed by ECO. 9. All construction / building related rubble left on site is to be collected and removed from site and disposed of at a registered dumpsite. 10. Rubble buried in the soil must be removed to a depth of 100mm.	Contractor / ECO
Equipment & Services	1. Structures comprising the construction camp to be removed. 2. Area that constituted the construction camp to be checked for spills / waste of materials such as oil, diesel, paint etc. These are to be cleaned. 3. All temporary services to the site (sewage removal, waste removal etc.) to be cancelled.	Contractor / ECO

Activity	Mitigating Measure	Responsible Party
Rehabilitation	1. Existing access roads to be left accessible for maintenance purposes in the future. 2. The entire scarred area is to be levelled off as close as possible to the surrounding topography so as not to hinder water drainage and cause channelling which may in time lead to erosion. 3. Compacted soils should be ripped following the construction phase of the project. Topsoil should be spread over the work area to ensure optimal rehabilitation to a state similar to pre-construction activities. 4. If the area requires 'cut and fill' to a depth greater than 300mm, the topsoil is to be removed prior to cutting. 5. Care should be taken to not create slopes exceeding heights of surrounding areas, which could lead to soil erosion. 6. Erosion monitoring and control should be conducted, as part of the maintenance and control of the operation phase. 7. All areas subjected to hydrocarbon spills should be cleaned. The contaminated soils should be remediated and replaced. 8. Areas of standing water should be prevented. 9. Landscaping for the entire site and disturbed areas to be done by a landscape architect in accordance with the ECO. Only indigenous tree and other indigenous plant species to be used to enhance the conservation of indigenous biodiversity. Top soil to be used as far as possible applicable. 10. Following completion of all rehabilitation measures, a final site inspection is to be conducted by the Contractor, the ECO and the PM, to ensure full compliance with all requirements as per the EA, the EMPr and the mitigating and rehabilitation measures as per the various Specialist Studies conducted.	Contractor / ECO / PM

9. Conclusion

It is vital to ensure that the management and mitigation measures stipulated in the EMPr are adhered to and that all tasks are completed to ensure that no environmental pollution or degradation takes place during the construction and operational phases of the proposed development. The management measures of the EMPr must be implemented prior to the construction phase.

The applicant must also ensure that all relevant personnel are appointed to manage the project and ensure that the EMPr conditions are implemented.

Your attention is also drawn to the fact that this EMPr document is a legally binding document. It must be signed by the Applicant, thus agreeing to all aspects mentioned and instructions to be met accordingly. Signing and acceptance of this EMPr will be undertaken once an Environmental Authorisation was granted by MDARDLEA.

LIST OF REFERENCES

- Government Notice, 546 Government Gazette 33333, 29 June 2010, *Approaching the Environmental Management Programme*
- Kleynhans C J, Thirion C and Moolman J A Level I River Ecoregion classification System for South Africa, Lesotho and Swaziland. [Report]. - Pretoria : Department of Water Affairs and Forestry, 2005.
- National Environmental Management Act, (1998)
- National Water Act (Act 36, 1998)
- Occupational Health and Safety Act [OHSA], (1993)

ACCEPTANCE

DECLARATION OF UNDERSTANDING BY THE DEVELOPER

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Programme for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the Contract. I also declare that I am aware that the management measures contained in this EMPr is binding on all contractors, labourers and personnel onsite.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____

DECLARATION OF UNDERSTANDING BY THE ENGINEER (IF APPLICABLE)

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Programme for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the Contract. I also declare that I am aware that the management measures contained in this EMPr is binding on all contractors, labourers and personnel onsite.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____

DECLARATION OF UNDERSTANDING BY THE CONTRACTOR (if applicable)

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Programme for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the Contract. I also declare that I am aware that the management measures contained in this EMPr is binding on all contractors, labourers and personnel onsite.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____

METHOD STATEMENTS

METHOD STATEMENT: Solid Waste Management

CONTRACT:…… **DATE**:……

WHAT WORK IS TO BE UNDERTAKEN? [give a brief description of the works to be undertaken on site that will generate waste (hazardous and non-hazardous wastes)]: * Note: please attach extra pages if more space is required.

*Insert additional pages as required

WHERE ARE THE WORKS TO BE UNDERTAKEN? (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

METHOD STATEMENT: Solid Waste Management (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:…….. **End Date:**…….

HOW IS WASTE TO BE MANAGED ON SITE? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

*Insert additional pages as required

DECLARATIONS for Method Statement **Solid Waste Management (contd.)**

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

METHOD STATEMENT:

Crew Camps and Construction Lay Down Areas

CONTRACT:…… **DATE**:…….

WHAT CREW CAMPS AND CONSTRUCTION LAY DOWN AREAS ARE REQUIRED ON SITE DURING CONSTRUCTION? (give a brief description of these): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

WHERE ARE THE CREW CAMPS AND CONSTRUCTION LAY DOWN AREAS TO BE LOCATED? (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

METHOD STATEMENT:

Crew Camps and Construction Lay Down Areas (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:…….. **End Date:**…….

HOW ARE CREW CAMPS AND CONSTRUCTION LAY DOWN AREAS TO BE MANAGED? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

DECLARATIONS for Method Statement

Crew Camps and Construction Lay Down Areas (contd.)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

METHOD STATEMENT:

Workshop and Maintenance/Cleaning of Plant

CONTRACT:…… **DATE**:……..

WHAT WORK IS TO BE UNDERTAKEN? (give a brief description of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

WHERE ARE THE WORKSHOPS AND CLEANING BAYS TO BE LOCATED? (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

METHOD STATEMENT:

Workshop and Maintenance / Cleaning of Plant (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:…….. **End Date:**…….

HOW ARE WORKSHOPS AND PLANT MAINTENANCE / CLEANING TO BE MANAGED DURING CONSTRUCTION? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

DECLARATIONS for Method Statement

Workshop and Maintenance / Cleaning of Plant (contd.)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

METHOD STATEMENT:

Cement and Concrete Batching

CONTRACT:…… **DATE**:……..

WHAT WORK IS TO BE UNDERTAKEN? (give a brief description of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

WHERE ARE THE WORKS TO BE UNDERTAKEN? (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

METHOD STATEMENT:

Cement and Concrete Batching (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:…….. **End Date:**…….

HOW ARE THE WORKS TO BE UNDERTAKEN? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

DECLARATIONS for Method Statement

Cement and Concrete Batching (contd.)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

METHOD STATEMENT: Dust Control

CONTRACT:……. **DATE**:…….

WHAT WORK IS TO BE UNDERTAKEN ON SITE THAT COULD GENERATE DUST? (give a brief description of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

METHOD STATEMENT: Dust Control (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:…….. **End Date:**…….

HOW ARE THE WORKS TO BE UNDERTAKEN SO AS TO MINIMISE AND CONTROL DUST GENERATION ON SITE? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

*Insert additional pages as required

DECLARATIONS for Method Statement

Dust Control (contd.)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

METHOD STATEMENT:

Hydrocarbon and Emergency Spill Procedure

CONTRACT:…… **DATE**:……..

WHAT HAZARDOUS SUBSTANCES (INCL. FUELS) ARE TO BE STORED ON SITE? (give a brief description of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

WHERE ARE THE THESE SUBSTANCES TO BE STORED ON SITE? (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

METHOD STATEMENT:

Hydrocarbon and Emergency Spill Procedures (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:…….. **End Date:**…….

HOW ARE HAZARDOUS SUBSTANCES TO BE MANAGED TO AVOID SPILLAGES AND WHAT EMERGENCY PROCEDURES ARE TO BE IMPLEMENTED IN CASE OF A SPILLAGE? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

*Insert additional pages as required

DECLARATIONS for Method Statement

Hydrocarbon and Emergency Spill Procedures (contd.)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

METHOD STATEMENT:

Diesel Tanks and Re-fueling Procedures

CONTRACT:……. **DATE**:…….

WHAT WORK IS TO BE UNDERTAKEN? (give a brief description of the number and capacity of diesel tanks to be kept on site): * Note: please attach extra pages if more space is required

*Insert additional pages as required

WHERE ARE THE WORKS TO BE UNDERTAKEN? (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

METHOD STATEMENT:

Diesel Tanks and Re-fueling Procedures (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:…….. **End Date:**…….

HOW ARE DIESEL TANKS TO BE MANAGED AND RE-FUELLING TO BE UNDERTAKEN? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

DECLARATIONS for Method Statement

Diesel Tanks and Re-fuelling Procedure (contd.)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

METHOD STATEMENT:

Topsoil Management

CONTRACT:…… **DATE**:……..

WHAT WORK IS TO BE UNDERTAKEN? (give a brief description of the works to be undertaken that require topsoil to be stripped): * Note: please attach extra pages if more space is required

*Insert additional pages as required

WHERE ARE THE WORKS TO BE UNDERTAKEN? (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

METHOD STATEMENT:

Topsoil Management (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:…….. **End Date:**…….

HOW ARE TOPSOIL STOCKPILES TO BE MANAGED? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

DECLARATIONS for Method Statement

Topsoil Management (contd.)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

METHOD STATEMENT:

Fire Management

CONTRACT:…… **DATE**:……..

WHAT WORK IS TO BE UNDERTAKEN? (give a brief description of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

WHERE ARE THE WORKS TO BE UNDERTAKEN? (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

METHOD STATEMENT:

Fire Management (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:…….. **End Date:**…….

HOW ARE THE WORKS TO BE UNDERTAKEN? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

DECLARATIONS for Method Statement

Fire Management (contd.)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

METHOD STATEMENT:

Stormwater Management

CONTRACT:…… **DATE**:……..

WHAT WORK IS TO BE UNDERTAKEN? (give a brief description of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

WHERE ARE THE WORKS TO BE UNDERTAKEN? (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

METHOD STATEMENT:

Stormwater Management (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:…….. **End Date:**…….

HOW ARE THE WORKS TO BE UNDERTAKEN? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

DECLARATIONS for Method Statement

Stormwater Management (contd.)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

METHOD STATEMENT:

Soil Erosion Management

CONTRACT:……. **DATE**:…….

WHAT WORK IS TO BE UNDERTAKEN? (give a brief description of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

WHERE ARE THE WORKS TO BE UNDERTAKEN? (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

METHOD STATEMENT:

Soil Erosion Management (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:…….. **End Date:**…….

HOW ARE THE WORKS TO BE UNDERTAKEN? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

DECLARATIONS for Method Statement

Soil Erosion Management (contd.)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

METHOD STATEMENT:

Rehabilitation of Crew Camps and Other Disturbed Areas

CONTRACT:…….. **DATE**:…….

WHAT WORK IS TO BE UNDERTAKEN? (give a brief description of works to be undertaken that may result in the need for rehabilitation of the affected areas): * Note: please attach extra pages if more space is required

*Insert additional pages as required

WHERE ARE THE WORKS TO BE UNDERTAKEN? (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

METHOD STATEMENT:

Rehabilitation of Crew Camps and Other Disturbed Areas (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:…….. **End Date:**…….

HOW ARE THE REHABILITATION WORKS TO BE UNDERTAKEN? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

DECLARATIONS for Method Statement

Rehabilitation of Crew Camps and Other Disturbed Areas (contd.)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

INCIDENT AND ENVIRONMENTAL LOG

ENVIRONMENTAL INCIDENT LOG				
Date	**Env. Condition**	**Comments** *(Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available)*	**Corrective Action Taken** (*Give details and attach documentation as far as possible)*	**Signature**

10.Alien Eradication Plan

1. Prevention and early removal

The prevention and early removal of Alien plant species must be guided through a prevention and early detection strategy which will allow for the effective rehabilitation of disturbed areas as well as assist with the prevention of unnecessary disturbances of natural areas.

The prevention and early removal strategy should include monitoring plans which are specifically designed to identify Alien Invasive plants. This monitoring plan should be update as new Alien Invasive plant species are detected to populate the document with relevant Alien Invasive species found on site. This will also allow for planning the removal of these Alien Invasive plants in accordance with the correct removal technique. It is best advised to ensure early detection of Alien Invasive species rather than allowing the establishment of Alien Invasive Species.

2. Containment and control

Should any alien invasive plants establish on site, the applicant will be responsible to create action plans which should include the following aspects regarding the removal of these Alien Invasive Species: control, budgets, manpower considerations and time. A separate plan should be developed for each location and or each species, the action plan should also include registered chemicals and other techniques for the effective removal of the species. It is important to contain Alien Invasive species, this will allow that the least energy and resources are used.

3. Clearing and guiding principles

Control programmes for Alien Invasive Species are long term management projects, thus it must include an eradication plan which includes follow up actions. The smaller infested areas should be cleared first to prevent further infestation of the Alien Invasive species. All clearing actions should be recorded; and the records thereof must be kept, this will assist in monitoring and identifying areas due for a follow up clearing.

4. Control methods

- Different species require different control methods such as manual, chemical or biological methods or a combination of the two.
- Care should be taken to ensure that the clearing methods used do not encourage further invasion.
- As such, regardless of the methods used, soil disturbance should be kept to a minimum. The vegetative stage of the plants should also be considered before clearing.
- Fire is not a natural phenomenon in the area and should not be used in general for alien control or vegetation management at the site.
- The best-practice clearing method for each species identified should be used.
- The preferred clearing methods for most alien species can be obtained from the Department of Water and Agricultural Affairs (DWAF) Working for Water website: http://www.dwaf.gov.za/wfw/Control/

5. Use of herbicides for alien control

Although it is usually preferable to use manual clearing methods where possible, such methods may create additional mechanical disturbance which may stimulate alien invasion and may also be ineffective for many woody species which re-sprout. Where herbicides are to be used, the impact of the eradication programme on the natural environment should be minimised be observing the following:

- Area contamination must be minimised by careful, accurate application with a minimum amount of herbicide to achieve good control.
- Care must be taken to prevent contamination of water bodies. This includes special care in storage, application, cleaning equipment and disposal of containers, product and spray mixtures.
- Equipment should be washed where there is no danger of contaminating water sources and washings carefully disposed of in a suitable place.
- To avoid damage to indigenous or other desirable vegetation, herbicides that would have the least effect on the indigenous vegetation should be used.
- Droplet nozzles with a course spray pattern should be fitted to avoid drift of herbicides onto neighbouring vegetation.
- The appropriate health and safety precautions should be followed regarding the storage, handling and disposal of herbicides.

11.Alien Management Plan

1. Construction phase activities

The following management actions are aimed at reducing soil disturbance during the construction phase of the development, as well as reducing the likelihood that alien species will be brought onto site or otherwise encouraged.

Table 22: Construction phase activities

Action	Frequency
The ECO must provide permission prior to any vegetation clearing.	Daily
Clearing of vegetation should be undertaken as the work progresses – mass clearing should not occur unless the cleared areas will be affected by construction immediately afterwards.	Weekly
Areas that will be exposed for some time should be protected with packed brush, or appropriately battered with fascine work. Alternatively, jute (Soil saver) may be pegged over the soil to protect it.	Weekly

Action	Frequency
Cleared areas that have become invaded can be sprayed with appropriate herbicides if these are such that break down on contact with the soil. Herbicides with a residual action should not be used to encourage the emergence of indigenous plants.	Weekly
Although organic matter is frequently used to encourage regrowth of vegetation on cleared areas, no foreign material such as straw and manure should be brought onto site. Brush of an indigenous nature from cleared areas should be used as much as possible. The use of manure or other soil amendments is likely to encourage invasion.	Weekly
Clearing of vegetation is not allowed in the following instances: • Within 32 metres of any wetland; • Within 1:100-year flood lines; • On slopes steeper than 1:3. Permission should be granted by the ECO to specifically allow construction activities in these areas.	Weekly
Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas. (Attention must be paid to imported material such as building sand or dirty earth-moving equipment.) Stockpiled material should be checked on a regular basis and any weeds emerging from material stockpiles should be removed.	Weekly
Alien vegetation regrowth on areas disturbed by construction must be controlled throughout the entire site during the construction period.	Monthly
The alien plant removal and control method guidelines should adhere to the best practice for the species involved. Such information can be obtained from the DWS Working for Water website.	Monthly
Clearing activities must be contained within the affected zones and may not spill over into demarcated No-Go areas.	Daily
Pesticides may not be used. Registered herbicides may be used to control listed alien weeds and invaders only.	

2. MONITORING DURING CONSTRUCTION PHASE

The following monitoring actions should be implemented during the construction phase of the development.

Table 23: Monitoring activities during the construction phase

Monitoring action	Indicator	Timeframe
Document all alien species observed at the site	List of alien species	Pre-construction
Document alien plant distribution patterns	Alien plants distribution map within priority areas	3 Monthly
Document & record alien control measures implemented	Record of clearing activities	3 Monthly
Review & evaluate the control success rate	Decline in documented alien plant abundance over time	Bi-annually

3. OPERATIONAL PHASE ACTIVITIES

The following management actions are aimed at reduction of alien plant species within the site and maintaining non-invaded areas clear of aliens.

Table 24: Operational phase activities

Action	Frequency
Surveys for alien species should be conducted on a regular basis. Six monthly for the first two years after construction and annually thereafter. All aliens identified should be cleared.	Every 6 months for 2 Years and annually thereafter
Where areas of natural vegetation have been disturbed by construction activities, revegetation with indigenous, locally occurring species should take place where the natural vegetation is slow to recover or where repeated invasion has taken place following disturbance	Biannually, but revegetation should take place at the start of the rainy season
Areas of natural vegetation that need to be managed to reduce plant height or biomass, should be controlled using methods that leave the soil protected, such as using a weed-eater to mow above the soil level.	When necessary
No alien species should be cultivated on-site. If vegetation is required for aesthetic purposes, then non-invasive, water-wise species indigenous to the area should be used.	When necessary

4. MONITORING OPERATIONAL PHASE

The following monitoring and evaluation actions should take place during the operational phase of the development.

Table 25: Monitoring during the operational phase

Monitoring Action	Indicator	Timeframe
Document alien species Distribution and abundance over time at the site	Alien plant distribution map	Biannually
Document alien plant control Measures implemented & success rate achieved	Records of control measures and their success rate. A decline in alien distribution and cover over the time	Biannually
Document rehabilitation measures implemented and success achieved in problem areas	Decline in vulnerable open areas over time	Biannually