

ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) FOR HERONBRIDGE COLLEGE SPORT-FIELD DEVELOPMENT



HeronBridge
COLLEGE

Contact Details:

Name: Grant Caw

Address: Postnet Suite 707, Private bag x153, Bryanston, 2021

Tel: 011 540 4800 **Fax:** 082 450 8816 **Email:** grant@heronbridge.co.za

Report Compiled by:



Prism EMS

PO Box 1401
Wilgeheuwel

Johannesburg
1736

Tel: 011 475 0210
Fax: 086 601 4800
E-Mail: prism@prismems.co.za

Report Authors:

Mr. A. Fourie *Cand.Sci.Nat. (BSc. Environmental Science)*

Report Co-Authors:

Mrs. V. Stippel *Pr.Sci.Nat. (MSc. Ecol, Env, & Cons)*

Ms. C. Lubbe *Pr.Sci.Nat. (BSc. Ecology, Environment & Conservation)*

Mr. DW Botha *(M.A. Env. Man.)(PHED)*

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Report Author	Mr. A. Fourie <i>Cand.Sci.Nat</i> <i>(BSc. Hons. Environmental Science)</i> EAP		07/2017
Report Co-Author	Mrs. V. Stippel <i>Pr. Sci.Nat.</i> <i>(MSc. Ecology & Environmental Conservation)</i> EAP		08/2017
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ABBREVIATIONS

DWS	-	Department of Water and Sanitation
EA	-	Environmental Authorisation
EAP	-	Environmental Assessment Practitioner
ECO	-	Environmental Control Officer
EMPr	-	Environmental Management Program
GDARD	-	Gauteng Department of Agriculture and Rural Development
NEMA	-	National Environmental Management Act, 1998
NWA	-	National Water Act, 1998
OHSA	-	Occupational Health and Safety Act, 1993
PPE	-	Personal Protective Equipment
PPP	-	Public Participation Process
SABS	-	South African Bureau of Standards
SEA	-	Strategic Environmental Assessment
SUDS	-	Sustainable Urban Drainage System
WSUDS	-	Water Sensitive Urban Design System

1 INTRODUCTION

1.1 Project Overview

Heronbridge College NPC is intending to develop a sports-fields and related facilities on portion 112 (a portion of portion 17) of the farm Nietgedacht 535 JQ, Gauteng province. The sports fields and facilities will be related to the existing Heronbridge College which is located on portion 36 and 38 of the farm Nietgedacht 535 JQ which is already owned by the Applicant (Heronbridge College NPC).

In addition, the proposed development also involves the provision of all necessary services to the development including water, sanitation, stormwater and roads.

The Gauteng Department of Roads and Transport is intending to construct the planned K52 road through Heronbridge College's existing sports-facilities on Portion 38 of the farm Nietgedacht 535 JQ, thus forcing the school to relocate its facilities to a section of Portion 112 in order for the school to secure their future.

The timeframes for the commencement and construction of the K52 road is unknown, however, due to the timeframes related to the successful relocation of the sports facilities, the school thought it best to relocate as soon as possible to minimize the disruption to the schools program.

Prism Environmental Management Services (Prism EMS) has been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the required environmental authorisation processes required by a host of environmental legislation. As part of this process, an Environmental Management Programme (EMPr) has been compiled (this document).

Three alternatives were assessed as part of the Basic Assessment Process in addition to the No-Go Alternative. These included:

- **Proposal** – Preferred;
- Alternative 1; and
- Alternative 2.

Based on the impact assessment undertaken as well as the findings of the specialist study and the need for the project, it is the opinion of the EAP, that the **proposal be approved**. It should be noted that mitigation measures contained in this report apply to all alternatives. As the proposed option and alternative 2 merely differs in design, the mitigation measures will be the same. Where additional mitigation measures are required for alternative 1, it will be indicated in *italics*.

1.2 Report Outline

The contents of this EMPr has been compiled according to the prescribed legal requirements contained in Appendix 4 of the EIA Regulations, 2014. Refer to Table 1-1 below. Additional sections have been added for purposes of best environmental practice.

Table 1-1: Contents of the EMPr.

Appendix 4 of the EIA Regulations, 2014	Reference in Report
(a) Details of the: <ul style="list-style-type: none"> (i) EAP who prepared the EMPr; and (ii) Expertise of the EAP Including CV 	Section 1.3
(b) Detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description	Section 2.2
(c) Map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided including buffers	Figure 2.1
(d) 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 - <ul style="list-style-type: none"> (i) Planning and design (ii) Pre-construction activities (iii) Construction activities (iv) Rehabilitation of the environment (v) Operation activities 	Section 4.1
(e) A description and identification of impact management outcomes required for the aspects contemplated in (d)	Section 4.2
(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, add actions to – <ul style="list-style-type: none"> (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) comply with any prescribed environmental standards and practices; <ul style="list-style-type: none"> (iii) Comply with any applicable provisions of the Act, regarding closure where applicable; and (iv) Comply with any provisions of the Act regarding financial provision where applicable 	Section 6
(g) Method of monitoring the implementation of the impact management	Section 5.1

actions	
(h) Frequency of monitoring the implementation of the impact management actions	Section 6
(i) Indication of the persons who will be responsible for implementation of the impact management actions	Section 3 Section 6
(j) Time periods for implementation of impact management actions	Section 6
(k) Mechanism for monitoring compliance with the impact management actions	Section 5.2
(l) Programme for reporting on compliance, taking into account the requirements	Section 5.3
(m) An environmental awareness plan describing the manner in which – (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment	Section 7
(n) any specific information that may be required by the competent authority	Not applicable
Environmental Best Practice	Reference in Report
Description of the various role players	Section 3
Penalties	Section 9
Acceptance/ Declaration	Section 11

1.3 Details of the EAP

Prism EMS has been appointed to undertake the required Environmental Authorisation process incorporating the required Environmental Impact Assessment and associated EMPr. Details and expertise of the Environmental Assessment Practitioner (EAP) who prepared the EIA Report is provided in Table 1-2. The expertise, including the curriculum vitae is attached in Section **Error! Reference source not found..**

Table 1-2: Details of the EAP.

EAP:	Armand Fourie
Company:	Prism Environmental Management Services cc
Qualifications:	BSc. (Hons) Environmental Science
Experience:	2 years
Affiliation/ Registration	SACNASP Cand.Sci.Nat. (116705)
Address:	PO Box 1401, Wilgeheuwel, 1736

Tel:	011 475 0210 / 087 985 0951
Fax:	086 601 4800
Email:	armand@prismems.co.za

Designation	Name	Qualification	Professional Registration	Specialist Assessment
Prism EMS Team				
Contact Details	Post: PO Box 1401, Wilgeheuwel, Johannesburg, 1736		Tel: 087 985 0951 Fax: 086 601 4800 Email: prism@prismems.co.za Website: www.prismems.co.za	
Senior Environmental Assessment Practitioner	Vanessa Stippel	MSc. Ecology, Environment and Conservation	SACNASP Pr. Sci. Nat. (116221)	EMPr Review
Senior Environmental Assessment Practitioner	Candis Lubbe	BSc. (Hons) Ecology, Environment and Conservation	SACNASP Pr.Sci.Nat. (116831)	Environmental Impact Assessment Review
Principal EAP	De Wet Botha	MA. (PHED) Environmental Management	SACNASP Registration in process	Project Management

1.4 Details of the Holder of the Environmental Authorisation

The applicant responsible for implementation of the conditions of the Environmental Authorisation and the management measures stipulated within the EMPr is **Heronbridge College NPC**. (Table 1-3.).

Table 1-3: Details of the holder of the environmental authorisation.

Applicant:	Heronbridge College NPC
Contact Person:	Mr. Grant Caw
Address:	Postnet Suite 707, Private Bag x153, Bryanston, 2021
Tel:	(011) 540 4800
Fax:	082 450 8816
Email:	grant@heronbridge.co.za

2 DETAILS OF PROJECT

2.1 Location

The proposed Heronbridge College Sports-field development is located on Portion 112 (Part of Portion 17) of the farm Nietgedacht 535 JQ, Gauteng Province. The property is situated adjacent to Road P39/1 [Planned K52], just to the South of the N14 Freeway. This road is the East-West road that runs to the

south of the N14 and connects the Tshwane Area with Muldersdrift. It is also known as the “Old Krugersdorp Road”.

The co-ordinates of the Access Road to Property are as follows:

- Latitude: -25.945264°S
- Longitude: 27.965636°E

The 21-digit Surveyor General code for the affected property is provided in Table 2-1.

Table 2-1: Surveyor General Diagram Numbers.

Description	Surveyor General Diagram number
Portion 112 of the farm Nietgedacht 535 JQ	T0IQ00005350000011200

Refer to Figure 2-1 below for a visual indication of the site location.

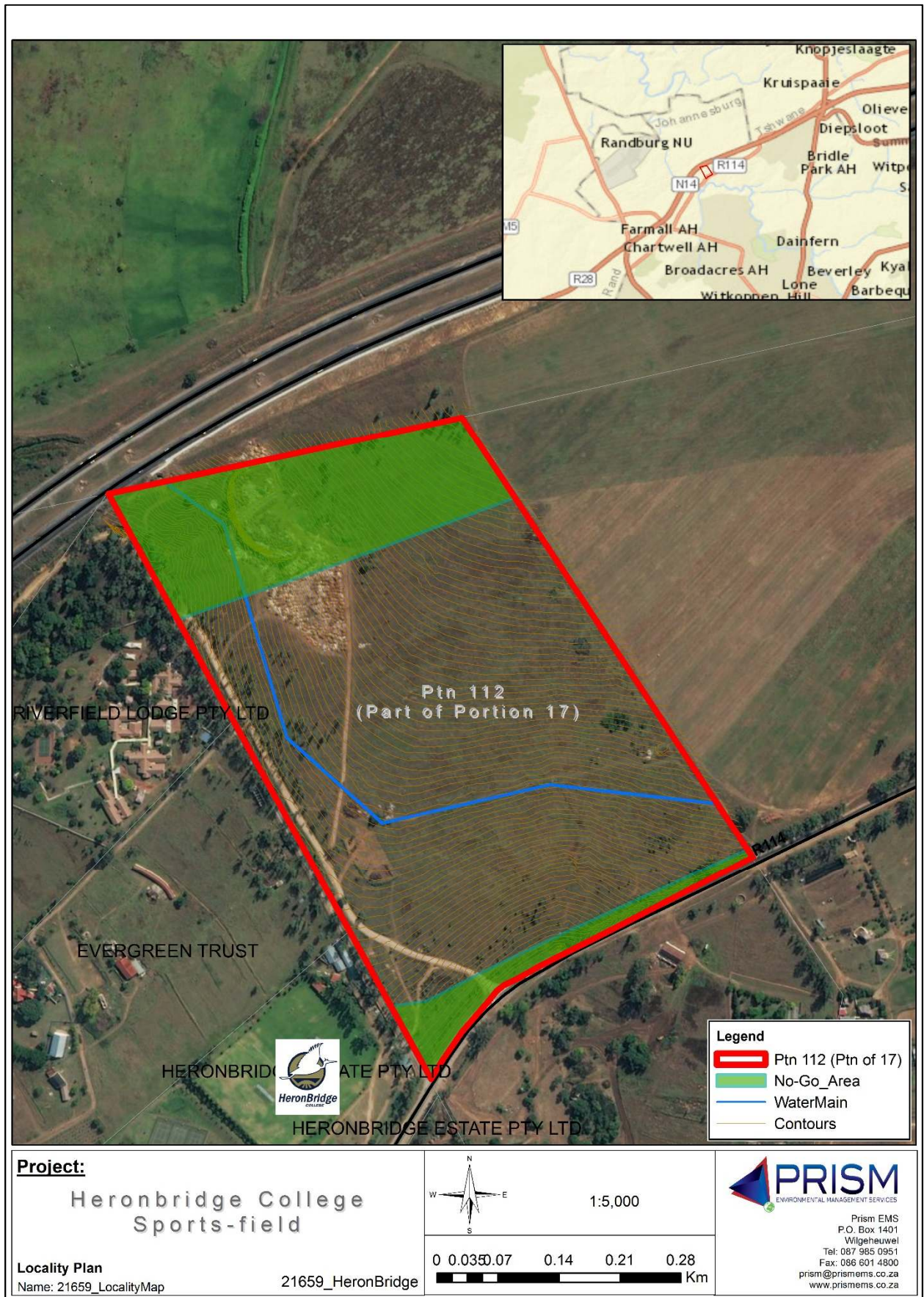


Figure 2-1: Location of proposed site.

2.2 Description of Project

The proposed Heronbridge Sports-field development will involve the relocation of various facilities pertaining to School sports, and is further described below.

The proponent is left with little choice but to relocate the current sports-facilities, due to the planned K52 road cutting through the middle of their existing facilities. Portion 112 is the only viable option for relocation as it provides sufficient space the relocation and possible future expansions. The nature of the project makes it impossible to replicate on any other portion nearby. As the project is related directly to the Heronbridge College it is required to be adjacent to the school for safety and practical reasons. The timeframes related to a relocation of this magnitude requires the application to commence as soon as possible as the competitive season relating to these sports disciplines are stretched over an entire year, with the school not being able to afford any constraints relating to incomplete fields.

The proposed layout transforms less than 20 ha of natural vegetation on portion 112 of the farm Nietgedacht. The proposed layout is preferred as it transforms the least amount of land for the purpose of the proposed development. It also makes provision for the rehabilitation and protection of the sensitive area in the northern section of the property (Figure 2-2).

The proposed layout makes provision for the following facilities on Portion 112 Nietgedacht is as follows:

- Two (2) cricket oval areas
- Two (2) hockey fields
- Tennis Courts
- Netball Courts
- Basketball Courts
- Three (3) change and ablution facilities
- Security office, Store and staff unit
- Vehicular Parking Areas

2.2.1 Summary of alternatives considered

No.	Alternative	Description
1	Proposal	The proposed layout utilises a section of Portion 112 and facilitates the relocation of the existing sports-field and provides sufficient space for future expansion without extending the development footprint. This is the most cost and time effective option and provides the best visual representation from the planned K52.
2	Alternative 1	The first alternative is to utilise the entire portion 112 thereby spreading out the layout across the entire site. Expanding the development footprint across the entire site will result in a full EIA & scoping report to be conduct as well as water use licences. The cost to spread out the development will also increase. This alternative will also result in a larger transformation of natural vegetation.
3	Alternative 2	The second alternative includes an alternative layout to the proposed option within the same development footprint. It will include the same amount of facilities but within different locations within the site. This alternative is viable but not the preferred option as it affects the visual aesthetics of the site and does not visually represent as well as the preferred option.
4	No-Go Option	The no-go option includes not erecting Sports-facilities on the proposed site, however, if the sports-facilities are not relocated before the planned K52 is constructed, the school will lose all their facilities and will result in a detrimental effect on the school as they will be unable to compete in these sports disciplines. If the school is unable to compete it could result in the school closing down.



Figure 2-2: Proposed layout of Sports-field

2.2.2 Water Services

An Outline Scheme Report was developed by Chrisen Consulting (Pty) Ltd (2017). Potable water will be required to service the proposed ablutions, security office and stores. Water for irrigation of the lawns and cricket fields is to be carried out with "Grey Water". Water is to be extracted from the existing borehole on site and treated accordingly. The "grey water" to be used will be extracted from the on-site treatment facility and the existing on-site "grey water" sewer line crossing the site.

2.2.3 Sewer Services

Heronbridge College Proposes to install an on-site SBR Activated Sludge Wastewater Package Plant to treat the sewer produced on site to "grey water" quality. It is then their intention to release the treated "grey water" into the existing treated sewer pipeline servitude when needed. The treated "grey water" will be used to irrigate the grassed facilities when needed. The sewer pipeline servitude is 1.89m wide and will be protected and incorporated in the new development. The invert levels of the pipe will be confirmed prior to any bulk earthworks design and construction taking place. Heronbridge College has advised that the application for extracting "Grey Water" from the existing "Grey Water Sewer line" has been made to the department (JHB water). The department has advised that there are studies currently been undertaken in the area and will revert to them.

2.2.4 Stormwater Services

The site naturally drains in two directions viz. The upper portion drains in a westerly direction and the lower portion drains in a southerly direction. There is an existing stormwater drainage culvert located at the southern end of the plot. Of the 19.38 ha which can be used for development a total of 7.07 ha (70702 m²) will be utilised.

In the Post-Development state, the catchments are determined from the designed / asbuilt falls and drainage of the proposed facilities. The anticipated general drainage directions of the facilities which impact the size of the previously determined catchments however the outfall points remain the same. In general, the sporting facilities will vary in fall between 0.25% - 0.5% with the surface coverings. The parking facility is likely to not exceed 4% in longitudinal grade with a basic drainage cross-fall. As the outfall points are approached then the natural grade of the terrain will rule.

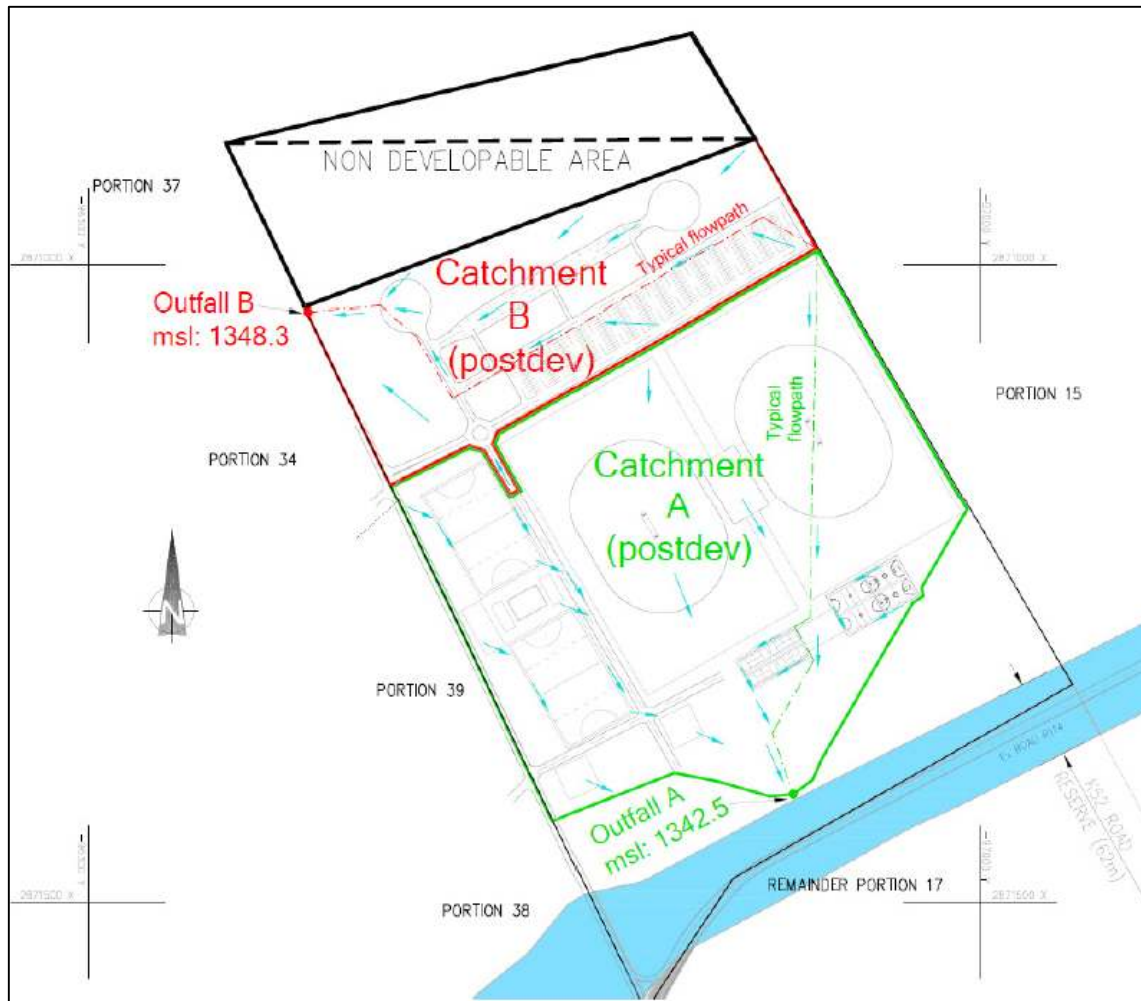


Figure 2-3: Catchments Post-Development

Outfall A post development hydrograph calculations indicate:

- In the 1:50 year rain event, the stormwater attenuation volume required = 1084 m³.
- the 1:10 year rain event, the stormwater attenuation volume required = 843 m³.

Outfall B post development hydrograph calculations indicate:

- In the 1:50 year rain event, the stormwater attenuation volume required = 182 m³.
- the 1:10 year rain event, the stormwater attenuation volume required = 178 m³.

Drainage is achieved by a network of open channels, grid inlets, field inlets and reticulation pipework. Attenuation is achieved in the attenuation ponds provided. The Hockey Fields, Netball Court, Tennis Courts and Basketball Courts shall be drained into half round concrete channels running adjacent the longitudinal lengths of the courts / fields. The cricket fields shall be drained by subsurface slotted pipes with the tie-in manhole situated at the low point. The roads shall be drained by catchpits situated at road edge. The car park will be drained into an open V drain channel running adjacent the longitudinal length, top width of 1.2 m with a depth of 200 mm (side slopes of 1:3). The channel will be lined with precast grass blocks which will assist with erosion control as well stability when traversed over by light duty traffic. All buildings shall drain into manhole type structures situated adjacent each building.

The flow is then ponded in attenuation ponds specific to Outfall A (min pond volume of 1084 m³) and Outfall B (min pond volume of 182 m³). The ponds are formed by earth berms of side slopes 1:1 with a 2 m wide central top strip. The flow is directed by wingwalls toward the attenuation control structure which has orifices and weirs to regulate the flow such that the pre-development flow rate is not exceeded.

2.2.5 Roads

The Gauteng Transport Infrastructure Act (No. 8 of 2001) dictates the minimum distance to construct an access road from a provincial road. This leaves little leeway for access alternatives as the proposed property can only be accessed from the proposed access road. The Act prevents any direct access to K-class roads and must therefore be provided from the Riverfield road. The location of the proposed access road aligns with Portion 38 and 38's proposed access which not only makes it safer but more cost effective.

It was therefore recommended that two (2) accesses be provided off Riverfield Road.

- **Access A:** Emergency access
- **Access B:** Vehicle and pedestrian entrance / exit

Access A will only be used during the emergency situations and will not allow public access. Alternative locations for the access roads were also not investigated as the two provided will also serve neighbouring properties, deviating from the proposed design would impact neighbouring properties access.

Heronbridge College is proposing to provide grass & gravel based internal parking for the sports-facilities.

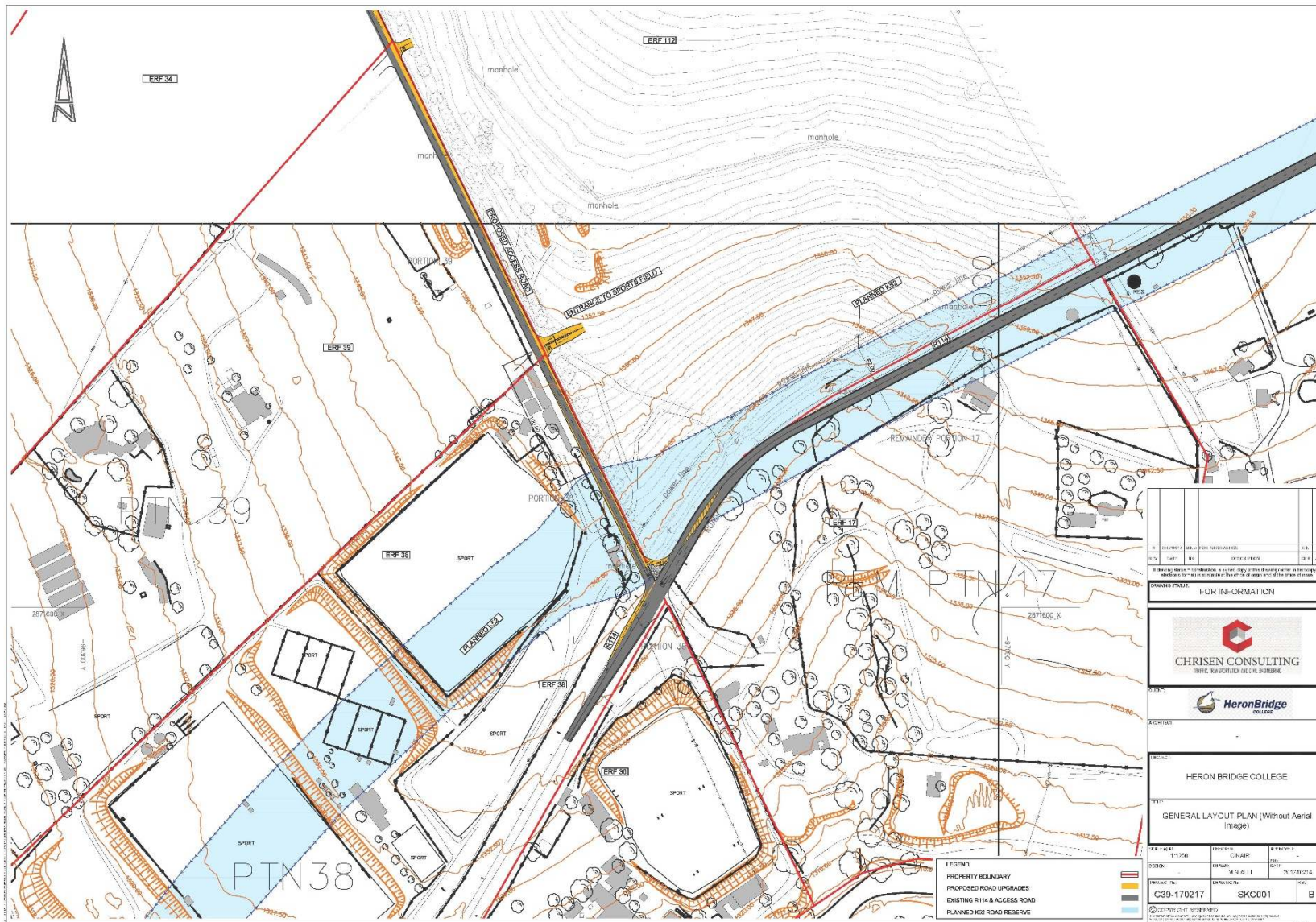


Figure 2-4: Planned K52 road alignment

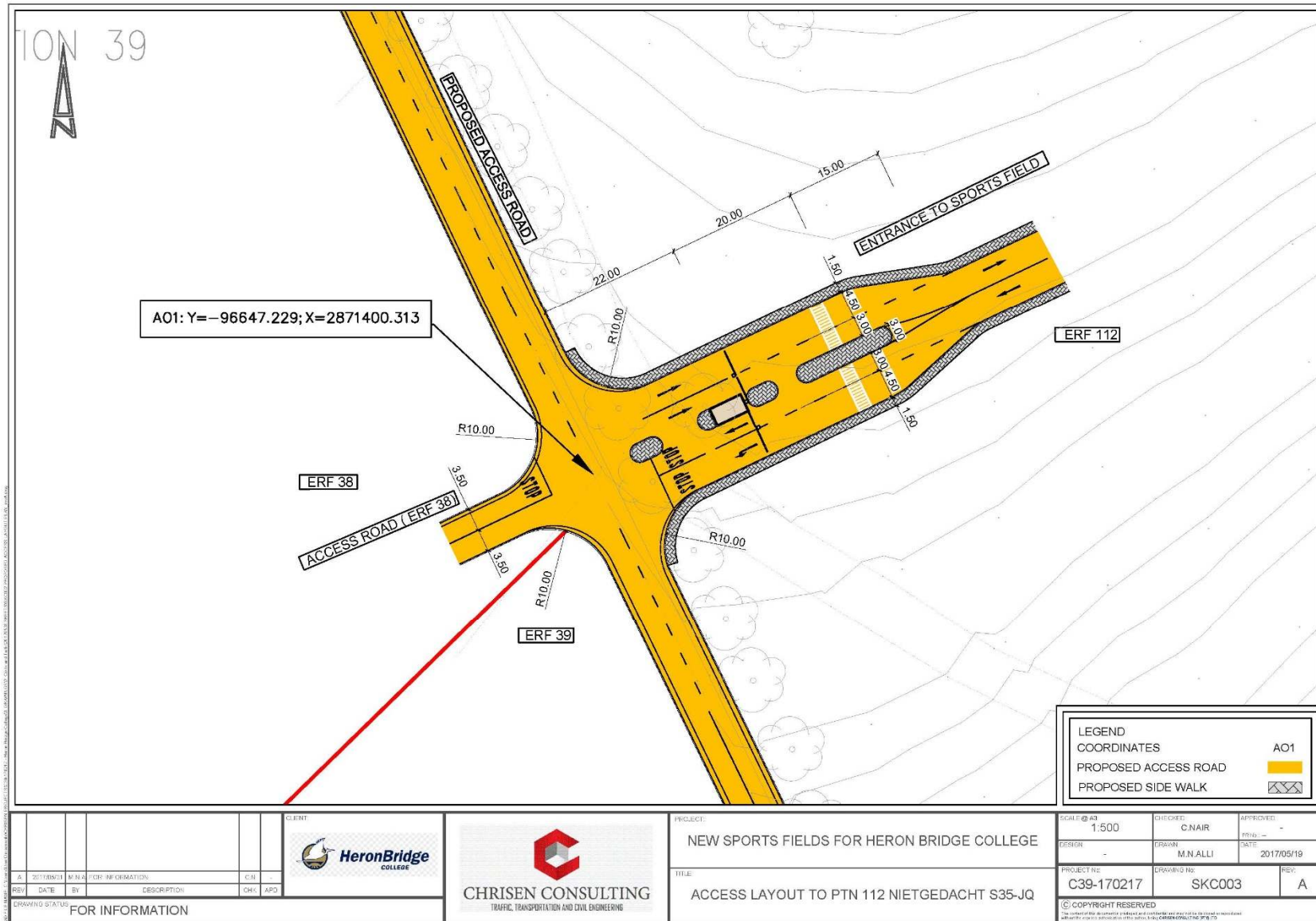


Figure 2-5: Proposed site entrance

2.2.6 Timeframes

The proposed development will be constructed according to the following preliminary timeframes, see Table 2-2.

Table 2-2: Operational hours for construction phases.

Period	Open	Close
Weekdays	07:00	18:00
Saturdays	07:00	13:00
Sunday	Only when required	
Public holidays	Only when required	

2.2.7 Ancillary Infrastructure

No major infrastructure is required on site for the construction of the development. The required ancillary infrastructure for the purposes of supporting services is discussed below.

2.2.7.1 Security

A construction camp will be erected on site for the duration of the construction phase. This camp will be fenced for security purposes. A security guard will also be posted on site during non-operational times. A wall/ fence will be erected around the property boundary as part of the development project. The development footprint will be fenced off to prevent anyone from entering the No-go area.

2.2.7.2 Sanitation

During the construction phase of the project, temporary chemical toilets/ facilities will be used. Chemical toilets will be placed on site for the duration of the construction phase. The water and sewer system will be installed as part of the project, which will be used during operational phase of the project.

2.2.7.3 Parking

Designated parking areas will be established during the construction phase for construction equipment and vehicles.

2.3 Operational Activities

Operational activities will involve the management and maintenance of facilities and grounds within the development footprint.

2.4 Drainage Rehabilitation Activities

The rehabilitation activities relate to the cleaning and rehabilitation of the drainage line, even though its located outside of the development footprint.

2.5 Site Sensitivity

The Site sensitivity is described below as investigated by the appointed specialist

Ecological Sensitivities:

Apart from some impacts, such as alien invasive species, footpaths and a leaking sewage line, the vegetation of the grassland and rocky outcrops on the proposed development site is in a very good condition, and represents the Egoli Granite Grassland vegetation type. In terms of species diversity, the most important and sensitive plant is *Hypoxis hemerocallidea*, which is classified as 'Declining'. *Hypoxis hemerocallidea* is, however, easy to transplant.

The proposed development site is considered sensitive, but some impacts can be reduced by implementing mitigating measures and proper planning in terms of site layout.

Wetland Ecological Importance and sensitivities:

The Study site measures approximately 19 hectares. The study site is located in quaternary catchment A21C in the old Crocodile (West) and Marico Water Management Area (WMA 3), now Limpopo (WMA 1). The study area falls within the Grassland Biome (Biome 06), the Highveld Level-1 Ecoregion (Ecoregion 11) (Kleynhans et al., 2005).

The following Hydrogeomorphic wetlands were identified during the site evaluation:

- Drainage line (Stream Headwater)
 - 21659_CHS was found on the slope draining towards the West.

The drainage line recorded was assessed and the following results were attained:

- The drainage line attained a low overall PES (Present Ecological State)
 - 21659_CHS - PES = E. Highly modified. A severe change in ecosystem processes and loss of natural habitat and biota has occurred, however some of the natural habitat remains intact. This drainage system is impacted by historical illegal dumping. It forms part of a larger watercourse and is the headwaters of a stream and tributary of the Jukskei River.
- The drainage line attained a low Ecological Importance and Sensitivity (EIS) score.

- 21659_CHS - EIS = D. The drainage line (Stream Headwater) is not considered to be ecologically important and sensitive. The biodiversity of this watercourse is low with no red data species recorded. It is fairly sensitive to flow and habitat modifications. It plays a minimal role in moderating the quantity and quality of water of major rivers as the system is too small to have a major contribution. The system drains into the Jukskei River.
- The Recommended Ecological Classification (REC) classification was rated as:

The drainage line will not be impacted by the proposed development activities, except for the rehabilitation of the system as part of the development. This impact will be localised and positive in nature. No surface water flow will enter the drainage from the development as the development activities falls outside the catchment of the system. It will thus improve in terms of its current Ecological Category after the rehabilitation and restoration of the system. It is thus rated that the Recommended Ecological Category (REC) will fall into:

- Category C for 21659_CHS

Concluded from the results presented in this document, the development activities will not impact on the drainage system but, the rehabilitation will positively impact on the drainage line and impacts predicted 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.

The rehabilitation of the drainage line is vital to recover the required ecological function. The aquatic drivers must be enhanced as part of the rehabilitation of the affected areas. In respect of the rehabilitation phase, it is important to ensure that the required erosion protection and silt distribution curbing measures and storm water management linked to the rehabilitation be carefully designed and installed.

The project can be supported, should all the mitigation measures be implemented and monitored against to ensure compliance.

Heritage Impact Assessment:

HCAC was appointed to assess the study area in terms of the archaeological component of Section 35 of the NHRA as part of the Environmental Impact Assessment (EIA) for the project. No significant Stone Age sites were recorded in the study area and no ceramics or stone walls attributed to the Iron Age were recorded. Similarly, no sites of archaeological significance were recorded by other studies in the area (e.g. Kusel (2007), van Schalkwyk (2013) van der Walt (2015 a and b, 2016).). No further mitigation prior to construction is recommended in terms of the archaeological component of Section 35 for the proposed development to proceed. According to the SAHRA Paleontological Sensitivity map the area is of zero paleontological sensitivity and no further studies are required in this regard.

In terms of the built environment of the area (Section 34), no structures occur within the study area and in terms of Section 36 of the Act no burial sites were recorded in the study area. However, if any graves are located in future they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation.

An overview of the environmental sensitivity is provided in Figure 2-6 below.

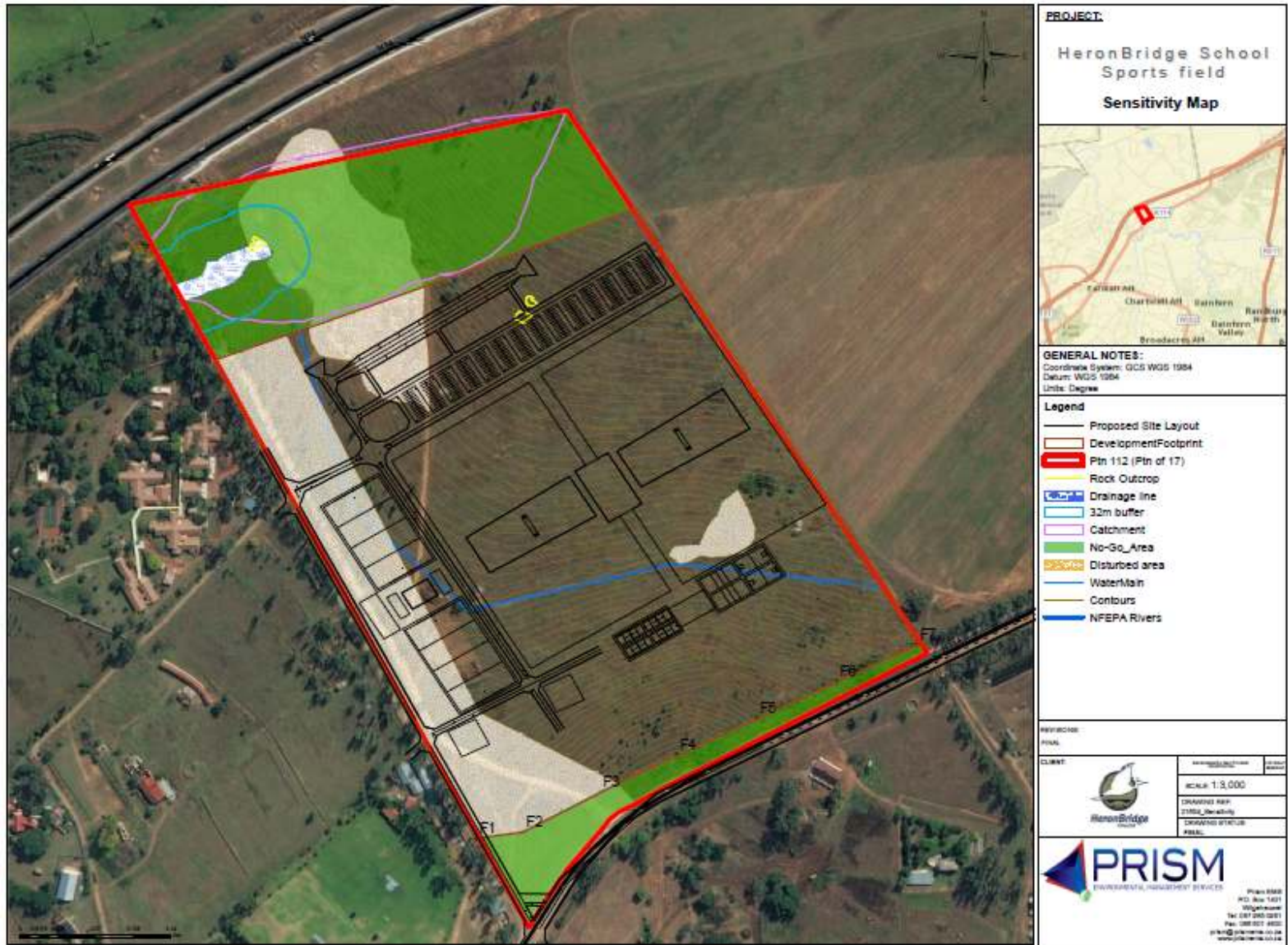


Figure 2-6: Environmental Sensitivity

3 GENERAL ROLES AND RESPONSIBILITIES

There are various role players that are involved in responsible environmental management. Role players are applicable to the Heronbridge College Sports-field development are indicated in Table 3-1. More information on each role player is then indicated in the subsections that follow.

Table 3-1: Summary of role players and responsibilities.

Type	Role Player	Responsibility
Regulatory Authorities	Gauteng Department of Agriculture and Rural Development (GDARD)	Decision maker for environmental authorisation
	Department of Water and Sanitation (DWS)	Decision maker for General Authorisation.
Holder of Environmental Authorisation	Heronbridge College NPC	Implement conditions of EMPr and environmental authorisation
Landowner	Heronbridge College NPC	State of land including contamination and rehabilitation
Independent Consultants	Environmental Control Officer (ECO)	Monitoring compliance and provision of recommendations where compliance is
	Sub-contractor(s)	Various specialised activities: <ul style="list-style-type: none"> - Waste management - Construction - Operational aspects - Monitoring

3.1 Gauteng Department of Agriculture and Rural Development (GDARD)

GDARD is the provincial competent authority for the Heronbridge College Sports-field development within the Gauteng Province. The GDARD is the designated authority tasked with granting the Environmental Authorisation (EA) and providing specific conditions.

GDARD also fulfils a compliance and enforcement role with regards to the EA. The Department may perform random inspections to check compliance. GDARD will also review the monitoring and auditing reports compiled by the ECO.

Amendments may be required to the EMPr, based on adaptive management to the site conditions and the technical requirements of the project. These amendments will need to be approved by GDARD.

3.1.1 Department of Water and Sanitation (DWS)

The National Water Act (Act No 36 of 1998) is the primary regulatory legislation; controlling and managing the use of water resources and is enforced by the DWS, who is the competent authority related to Section 21 water uses. A Basic Assessment Report and Water Use License Application (WULA) process has been followed for the proposed Heronbridge College and thus this EMPr includes mitigation measures and monitoring requirements for both the NEMA and NWA activities.

3.2 The Holder of Environmental Authorisation

Heronbridge College NPC is the holder of the environmental authorisation and is responsible for implementation of the conditions of the authorisation as well as the management measures contained in the approved EMPr (this report). The holder is ultimately liable for the potential impact of the activities that are undertaken and is tasked with effective management of these impacts. All liabilities associated with the land will lie with the registered land owner. Environmental liabilities include:

- Land contamination; and
- Landscaping activities.

The holder of the environmental authorisation is responsible for appointing any contractor required for the management of environmental impacts, such as waste management, monitoring or any other required activity. In addition, the appointment of an Environmental Control Officer (ECO) as may be required for monitoring of compliance during the construction phase.

3.3 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 must be initiated prior to the construction phase to ensure effective environmental management.

The ECO may be appointed to conduct regular audits, or at least relating to each phase of construction.

The ECO must:

- Be conversant with the requirements, stipulated mitigating measures as per the relevant compliance documents, in particular 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 program 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;
- Determine and enforce of environmental “no-go” areas in consultation with site management staff and related to sensitive areas;
- Establish a complaints and/or incidents system for reporting incidents and resolving any environmental concerns that may arise;
- 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; and
- 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.

3.4 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 project. All contractor(s) employed by the developer in respect of any aspect of the construction of the Heronbridge College Sports-field development will be bound by all and any agreement between the holder of the environmental authorisation, landowner and contractors, to ensure compliance with the Environmental Authorisation (EA), mitigating measures included in the Specialist Studies, as well as this EMPr. The contractor must:

- 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; and
- Remain within the Development Footprint.

4 GOALS AND OBJECTIVES

4.1 Key Objectives of the EMPr

To mitigate any possible negative impacts identified in the EMPr for the construction and operation phases of the Heronbridge College Sports-field Development:

- To ensure effective communication with stakeholders and regulatory authorities;
- To ensure good housekeeping practices and general neatness on site;
- Mitigate any possible negative impacts identified in the EMPr for the construction and operational phase of the development;
- Prevent pollution to the receiving environment that may emanate directly or indirectly from the source (development activities) both during the construction and operational phases;
- Preserve flora and fauna;
- Preserve topsoil for optimal rehabilitation and landscaping following construction;
- Control the establishment of alien invasive plants during the construction phase of the project, as well as following rehabilitation of designated construction camp areas within the site thereafter; and
- 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.

4.2 Impact Management Outcomes

Through effective implementation of the environmental management measures, the following outcomes must be achieved:

- Responsible planning and layout of the construction site which ensures protection of sensitive environmental features;
- Environmental awareness creation and training which minimises environmental impacts and ensures compliance to relevant legislation and authorisations;
- A safe working environment for contractors/construction workers and the public is provided.
- Proper management of site clearing and establishment is undertaken to ensure minimal environmental disturbance;
- Ensure access to sensitive environmental features is restricted and proper access control is in place;
- Minimal disturbances to traffic due to delivery of construction material;
- Proper management of labour force is undertaken to ensure that:
 - There are no security-related issues or disturbance to tenants or landowners outside the construction footprint.
 - There is optimal use of local labourers.
 - There is no disturbance to sensitive environmental feature.

- Minimal environmental impacts associated with ablution facilities;
- Proper management, transport and disposal of waste at a licensed landfill;
- Effective and safe management of hazardous and non-hazardous materials on site, in order to minimise the impact of materials on the environment;
- Minimal environmental impacts associated with the management of workshops and equipment;
- Proper control and management of alien plants and noxious weeds;
- Proper stormwater management in line with the requirements of the Outline Scheme Report;
- All necessary services are in place in line with the requirements of the Outline Scheme Report;
- Dust monitoring and suppression to be implemented; and
- Adequate reinstatement and rehabilitation of construction areas.

5 MONITORING

5.1 Implementation

The method of monitoring the implementation of the management and mitigation measures stipulated within the EMPr (Section 6) are indicated in Table 5-1.

Table 5-1: Method of monitoring implementation of EMPr.

Method	Frequency	Responsibility	Main Topics	Outcome
Internal Inspections	Daily – Weekly	Construction Manager	<ul style="list-style-type: none"> Observe housekeeping practices Check for spillages, leaks or any other sources of pollution Observe waste management Observe stormwater control 	<ul style="list-style-type: none"> Based on observations identify need for protocols / procedures and compile where needed in order to comply with EMPr Verbally inform employees on any identified issues
Internal Audits	Monthly	Construction Manager	<ul style="list-style-type: none"> Check compliance with management measures in EMPr. 	<ul style="list-style-type: none"> Compile audit report with recommendations / actions where non-compliance was identified
External audits	By-weekly	ECO	<ul style="list-style-type: none"> Check compliance with management measures in EMPr. 	<ul style="list-style-type: none"> Compile audit report with recommendations / actions where non-compliance was identified. Meet the requirements for Audits as contained in the 2014 EIA Regulations.
Management Meetings	Quarterly – Bi-annually	Management	<ul style="list-style-type: none"> Discuss (problem solve) recurring issues or actions that require management intervention 	<ul style="list-style-type: none"> Record minutes of main points of discussion Implement outcome actions of meeting

5.2 Compliance Monitoring

The mechanism for monitoring compliance with the management and mitigation measures stipulated within the EMPr (Section 6) must include an audit undertaken by an independent Environmental Control Officer (ECO) as discussed in Section 3.3.

The objective of the environmental audit is to:

- Report on the level of compliance with the conditions of the environmental authorisation and the management and mitigation measures stipulated within the EMP;
- The extent to which the avoidance, management and mitigation measures provided in Section 6 achieve the objectives and outcomes in Section 4;
- Identify and assess new impacts and risks as a result of undertaking the activities;
- Evaluate the effectiveness of the management and mitigation measures generated in the EMPr;
- Identify shortcomings in the EMPr; and
- Identify the need for any changes to the avoidance, management and mitigation measures provided for in the EMPr.

5.2.1 Procedure

The following methodology or procedure is to be used for assessment of the management and mitigation measures of the EMPr:

- **Pre-site preparation:** prior to the site inspection a review of the management measures contained in the EMPr, and a checklist must be drawn up.
- **Site inspection:** the construction site camp must be traversed on foot and must include an assessment of each major component of the camp.
- **Documentation review:** after the site inspection a documentation review must be undertaken by requesting specific key documentation relating to the decommissioning process.

5.2.2 Evaluation Criteria

During evaluation of the EMPr, the following criteria is used:

- Management measures stipulated in the plan;
- Environmental monitoring required;
- Legal requirements; and
- Best practice observations.

The scores and description used in the evaluation of the EMPr are indicated in Table 5-2. Where any indication of non-compliance are determined, recommended actions will be provided

Table 5-2: Description of scoring during evaluation of the findings.

Score	Evaluation	Description
N/A	Not Applicable	Not applicable and will not be implemented or discussed/assessed.
0	Major Non-Compliance	Relates to the absence of a requirement needed to be implemented or the total breakdown of a process. A number of minor non-compliances listed against the same requirement may represent a total breakdown of a process and thus could collectively be a major non-compliance.
1	Minor Non-Compliance	The requirement is partially implemented or non-compliant.
2	Observation	Relates to a matter about which the Assessor is concerned but which cannot be clearly stated as non-compliance. Observations also indicate trends which may result in a future non-compliance.
3	Compliant	The project management plans and procedures are executed in a managed fashion (planned, tracked, verified and adjusted) based upon defined activities, inputs and outputs. Objective evidence is available for each process.

5.3 Reporting

All inspections undertaken as part of internal / external auditing must be provided in the form of a report. External audits will be submitted to the competent authority.

5.4 Monitoring Programme

Monitoring is required to ensure that the receiving environment at the proposed site is suitably safeguarded against the identified potential impacts, and to ensure that the environmental management requirements are adequately implemented and adhered to during the execution of the project.

More detail is provided below.

5.4.1 Environmental Monitoring

Environmental monitoring entails checking, at pre-determined frequencies, whether thresholds values for certain environmental parameters are being exceeded. The parameters will form the basis of the environmental monitoring programme.

Table 5-3: Environmental Monitoring

	Parameter	Monitoring Method	Monitoring Frequency - Construction	Monitoring Frequency - Operation
Grey Water Quality	As per requirements of WUL	As per requirements of WUL	N/A	As per the requirements of the WUL.
Water Consumption	kl Consumed	Meter	N/A	Monthly
Groundwater Quality	As per requirements of WUL	As per requirements of WUL	N/A	As per the requirements of the WUL.
Waste Management	Volume (Skip size)	Inspections waste manifest documents, Visual observations, Sorting bins inspections	On-going	On-going
Fuel Consumption	Volume	Fuel register	On-going	On-going
Machine Maintenance	Frequency	Maintenance register	On-going	On-going
Housekeeping	Best Practice	Observed Tasks, Site inspections, incident reporting, Corrective Action Notices	On-going	On-going

6 ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

The following Management and Mitigation Measures are applicable for the Pre-Construction, Construction and Operational Phases of the project.

6.1 Environmental Management and Mitigation Measures – Pre-Construction Phase

Potential Impact	Management Objective	Proposed Mitigation Measures/Management Actions	Frequency	Institutional Responsibility	Timeframes
LEGISLATIVE REQUIREMENTS AND DOCUMENT CONTROL					
General Requirements	All relevant authorisations, licences and approvals are in place prior to the commencement of construction.	<ul style="list-style-type: none"> Approvals to be in place prior to construction (EA). 	Once off prior to construction	Project Manager	Pre-Construction
	A formal document control system is in place to ensure all relevant documents are in place prior to commencement.	<ul style="list-style-type: none"> An environmental file/document control system must be designed and put in place. Prior to construction, the following documents must be included in the file: <ul style="list-style-type: none"> EMPr EA Monitoring Parameters 	Once off prior to construction	Project Manager	Pre-Construction
	Site specific method statements are compiled and	<ul style="list-style-type: none"> Based on the EMPr, the contractor must compile specific method statements which must be approved by the Project manager prior to 	Prior to construction	EO to compile Project manager to approve	Pre-Construction

Potential Impact	Management Objective	Proposed Mitigation Measures/Management Actions	Frequency	Institutional Responsibility	Timeframes
	approved.	construction. At a minimum, this should include: <ul style="list-style-type: none"> ○ Method Statement for site clearing; ○ Method Statement for establishing the construction camp; ○ Method Statement with regard to waste and wastewater management; ○ Method Statement to show procedures for dealing with possible emergencies that can occur, such as fire and accidental leaks and spillage of carbon fuels and oils; ○ Method Statement for dust control; ○ Method Statement for the storage and handling of hazardous substances; ○ Method Statement for controlling alien invasive species and noxious weeds; and ○ Method Statement for rehabilitation of construction footprint. ○ Method Statement for rehabilitation of Drainage area. 			

Potential Impact	Management Objective	Proposed Mitigation Measures/Management Actions	Frequency	Institutional Responsibility	Timeframes
BARRICADING OF SENSITIVE FEATURES					
Barricading of sensitive features	Impacts to sensitive features	<ul style="list-style-type: none"> Suitable specialist(s) or ECO to identify sensitive environmental features (Rocky outcrops, red and orange listed species) where special care needs to be taken to safeguard these features (e.g. barricading, relocation etc.) <ul style="list-style-type: none"> Fence-off development footprint. Fence-off rocky outcrops. 	Once-off	ECO/Specialist	Pre-Construction
Search and rescue	Impacts to sensitive features	<ul style="list-style-type: none"> Suitable specialist(s) or ECO to survey all environmentally sensitive fauna and flora and facilitate the relocation to designated safe areas similar to the original habitats as part of landscaping/ no-go areas. 	Once-off/ As needed	ECO/Specialist	Pre-Construction
SITE ESTABLISHMENT					
General Site Camp Establishment	Surface Clearance	<ul style="list-style-type: none"> Prior to establishment of the site camp(s), the Contractor shall produce a plan showing the positions of sensitive environmental features, all buildings, lay down yards, batch plants, vehicle wash areas, vehicle repair area, batching areas and infrastructure approved by the Resident Engineer or PM. Site establishment is to be undertaken within a demarcated area (Development footprint). 	Once-off	Construction Manager/ECO	Pre-Construction

Potential Impact	Management Objective	Proposed Mitigation Measures/Management Actions	Frequency	Institutional Responsibility	Timeframes
		<ul style="list-style-type: none"> • Establishment of accommodation for the workforce on site is prohibited. • Security may be provided with facilities to accommodate 24 hour shifts but no accommodation. • Open fires are prohibited anywhere on site. • Smoking is only allowed in the designated safe smoking areas to be provided by contractor. 			

6.2 Environmental Management and Mitigation Measures - Construction Phases.

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
SITE CAMP ESTABLISHMENT					
Site Clearance	Soil Pollution	<ul style="list-style-type: none"> Cement slabs, paving and other hard surfaces will only be removed if specifically instructed to. 	Once-off	Construction Manager/ECO	Construction
Facilities at the Site Camp	Soil Pollution	<ul style="list-style-type: none"> Potable water must be made readily available to all construction staff. Chemical toilets must be supplied within the site camp. Ablution facilities (chemical toilets) are to be provided by the Contractor, at a ratio of 1:10. Ablution facilities (chemical toilets) must be erected no further than 100m from all workplaces. Toilets are to be secured to the ground, and must have a closing mechanism. Toilet paper must be provided at these facilities and must be serviced once per week. Certified contractors to maintain and remove chemical toilets regularly. The contractor must ensure that spillage does not occur when toilets are cleaned/serviced and contents must be properly stored and disposed 	Weekly	Construction Manager	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<p>of.</p> <ul style="list-style-type: none"> • Discharge of waste into the environment and/or burial of waste are strictly prohibited. • Washing of persons and effects, and ablution is only allowed at facilities provided. • Wash areas and ablution facilities are to be situated at least 100m away from watercourses, riparian zones and areas with shallow groundwater. • Sanitary arrangements must be to the satisfaction of the PM, ECO, the local authorities and the applicable legal requirements. • Areas demarcated for eating must be cleaned on a daily basis, to ensure adequate hygiene standards. 			
Workshop Area	Soil Pollution	<ul style="list-style-type: none"> • All vehicle/equipment maintenance and washing must be done in the workshop area, equipped with a bund wall and grease trap oil separator. • Workshop area must be monitored for fuel and oil spills. Spills must be cleaned up immediately and remediated to the satisfaction of the ECO and PM. 	Continuous	Construction Manager/ ECO	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<ul style="list-style-type: none"> Spill kits must be comprehensive and available on site at all times. An adequate supply of absorbent material must be available to accommodate emergency spills. 			
SOIL ALTERATION					
Topsoil	Loss of Topsoil	<ul style="list-style-type: none"> The ECO must document the management of topsoil via photographic evidence during the construction phase. Stockpiles (such as subsoil, rubble or construction material) other than topsoil must not exceed 2m in height. 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. The slopes of soil stockpiles shall not have a vertical/horizontal gradient exceeding 1:1.5. Clearance of topsoil to be done only immediately prior to work commencing in the subject area. Topsoil must remain uncontaminated by construction rubble and no vehicle movement is allowed onto or in the area immediately 	Continuous	Construction Manager/ ECO	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<p>surrounding the stockpiles.</p> <ul style="list-style-type: none"> • Topsoil and subsoil must be kept in separate piles and may not be mixed during stripping. • Topsoil stockpiles must be monitored for invasive exotic vegetation growth. • Remediation/rehabilitation, where required to be done in consultation with the ECO. • Soil stockpiles are to be stabilised if signs of erosion are visible. • Topsoil contaminated with alien vegetation must not be used for rehabilitation, unless mitigatory measures are implemented (i.e. germinating and eradicating of seedlings). • No activities, workforce or any construction related activities may be allowed onto topsoil stockpiles. • Double handling of soil stockpiles must be avoided and limited to once for piling and a second time for rehabilitation. • Dust suppression on stockpiles older than 2 months is required, with either water or biodegradable chemical agent 			

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
Soil Erosion	Soil Erosion	<ul style="list-style-type: none"> • Instability and erosion of steep slopes must be stabilised immediately. Re-vegetation in consultation with landscape architect and ECO should be done if required. • To reduce the loss of material by erosion, disturbance must be kept to a minimum. • If clearing of slopes occurs within the rainy season, earth berms must be created along the up-slope side of the construction area. • Where possible, natural vegetation should be retained to reduce the risk of erosion. • 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. 	Continuous	Construction Manager/ ECO	Construction
DRAINAGE AREA AND SURFACE WATER					
Site Camp	Water Quality	<ul style="list-style-type: none"> • The following activities must be implemented 	Daily	Construction	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
Workshop Concrete mixing Construction activities.		within the development footprint to prevent any impact on the drainage area. <ul style="list-style-type: none"> ○ Stock piling ○ Stormwater management ○ Dry season construction ○ Cofferdamming and filtration ○ No dumping of foreign material is allowed 		Manager/ECO	
STORMWATER					
Stormwater Management	Discharge to water	<ul style="list-style-type: none"> ● Implement stormwater management plan: <ul style="list-style-type: none"> ○ Open channels, grid inlets, field inlets and reticulation pipework must be put in place as required by the Stormwater Management Plan. ○ The Stormwater attenuation ponds must be put in place as per specifications of the Stormwater Management Plan. ● 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. ● Cut off drains may not cause additional harm to environment. Care must be taken to consider 	Weekly	Construction Manager/ECO	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<p>their position and the receiving environment.</p> <ul style="list-style-type: none"> • The Contractor is to ensure that excessive amounts of sand, silt and silt-laden water do not enter the stormwater system and/or drainage line to the north of the site. • Run-off containing high sedimentation loads must not be released into natural or municipal drainage systems. • 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. • Silt fences must be fit for purpose, effective and regularly maintained. • 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. • 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 			

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		operational phase. <ul style="list-style-type: none"> • Surface-water run-off and stormwater must be directed away from trenches and areas of excavation. • Any surface water pollution occurring as a result of negligence will be cleaned up by the Contractor or a nominated clean up organisation at the expenses of the Contractor. • Disposal of runoff or stormwater to the municipal system will be undertaken in accordance with the requirements of the local by-laws • All water bearing services must be provided with flexible couplings where pipes enter the building. • Stormwater management around the structures must facilitate the efficient disposal of excess water from the site. 			
BIODIVERSITY					
Fauna & Flora Management	Loss of Habitat	<ul style="list-style-type: none"> • Areas not earmarked for construction activities must be clearly demarcated with barrier tape and droppers to prevent vehicular movement in these areas. • Photographs of sensitive plants and animals must 	Continuous	ECO	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
	Flora	<p>be displayed in the construction camp to heighten awareness of these creatures.</p> <ul style="list-style-type: none"> • Should sensitive species be found, these need to be removed in consultation with an ecologist and with the necessary permit documentation and preferably be relocated within the development. • All landscaping must be done using indigenous vegetation. • The attenuation dam must be grassed and fenced. • Areas earmarked for construction of structures i.e. construction site offices etc. need to be cleared of bushes, trees, and plants. This should however be done in consultation with the ECO to ensure biodiversity is maintained and sensitive areas not disturbed. • Prior to the start of construction, woody vegetation matter shall be stripped, collected and disposed of at a registered dump site. • Alien, invasive species found within the construction area should be eradicated as far as possible and disposed of at a registered site. 			

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
	Fauna	<ul style="list-style-type: none"> • No trees/vegetation outside the construction area to be damaged/removed in any manner, for any reason. • The removal of plant material for medicinal purposes is prohibited. • The planting of exotic grasses excluding sports facilities should not occur, instead, non-invasive indigenous flora should be used where required (in consultation with the ECO and Ecological Consultant). • Cleared wood/vegetation is not to be used as burning wood or for any other purpose. • Where possible, work should be limited to only one area, to allow smaller fauna species the opportunity to move into undisturbed natural habitats. • If moles or evidence of moles residing on site is found. Photos must be taken and documented. The ECO must be informed and must provide suitable solutions for addressing the situation. The moles will usually relocate away from construction activities. 			

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<ul style="list-style-type: none"> • The feeding or leaving of food for stray or wild animals in the area is strictly prohibited. • No animals may be hunted, trapped or disturbed nor is fishing allowed during the construction phase of the project. • Nesting and breeding sites for birds and mammals must be avoided at all costs. • Should fauna be encountered during site clearance or during construction activities, earthworks shall cease immediately, until such fauna have been safely relocated. • No animal will be killed, unless an immediate threat to human health is perceived. In such an instance, the incident must be reported to the ECO and PM immediately. 			
DUST					
Site Clearing General construction activities	Dust Emissions	<ul style="list-style-type: none"> • A speed limit of 20km/h must be maintained on all dirt roads. • Dust suppression by means of either water or biodegradable chemical agent should be undertaken if necessary. 	Continuous	Construction Manager	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
NOISE					
Construction Activities	Noise	<ul style="list-style-type: none"> Noise levels are to be limited with due care to residents. Silencer units on plant and vehicles shall be maintained in good working order. All construction vehicles will be well maintained to ensure minimum noise disturbance. Operations must be restricted to hours of 07:00 and 17:00 on weekdays only to prevent undue noise disturbance. Should construction activities be required to continue over a weekend/public holiday or is expected to be excessively noisy, all I&AP's must be notified in writing, 24 hours in advance. 	Continuous	Construction Manager	Construction
WASTE MANAGEMENT					
Solid Waste Management	Domestic waste	<ul style="list-style-type: none"> Sufficient labelled or colour coded bins with lids are to be provided by the Contractor. Waste skips must be used if the amount of waste generated exceeds the bins capacity on a regular basis. Burying, dumping or burning of any waste material, vegetation, litter or refuse is prohibited. 	Continuous	Construction Management/ ECO	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
	Construction waste	<ul style="list-style-type: none"> • Waste skips must be made available on site and should be clearly marked or colour coded for its intended use (i.e. glass, plastics, hazardous etc.). • All waste generated on site must be pre-classified and separated as either general or hazardous waste. • Recyclable waste streams must be separated from other waste streams. Waste to be separated into recyclable and non-recyclable waste. Waste separation needs to occur before waste is placed in waste skips. • Solid waste shall only be stored in the designated general waste storage area which must be enclosed and impermeable. • All solid waste shall be disposed of by a certified contractor, off-site, at an approved landfill site if no municipal services are available. The Contractor shall supply the ECO with a certificate of disposal for auditing purposes. • Litter (from outside the camp included) and concrete bags etc. must be collected and put into 			

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
	Hazardous waste	suitable closed bins on a daily basis. <ul style="list-style-type: none"> • Construction rubble must be disposed of at a registered landfill site. • Construction rubble may not be used for infilling or levelling. • General wastewater on site to be collected and disposed of at a registered communal facility. • A penalty system for littering must be implemented. • Cement bags must be disposed of as hazardous waste 			
HEALTH, SAFETY & SECURITY					
Safety of Workers on site	Safety	<ul style="list-style-type: none"> • Appointed Safety Agent. • Contractor to submit a Health and Safety Plan, prepared in accordance with the Health and Safety Specification, for approval prior to the commencement of work. • All construction personal must be clearly identifiable. All employees must also be issued with employee cards for identification purposes. • Machinery and equipment must be maintained in a safe operating condition. 	Appointment and Plan – once off at start, other actions, ongoing	Health and Safety Manager/ Construction manager/ ECO	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<ul style="list-style-type: none"> • A complete, appropriate First Aid Kit must be available on site, within range of where labour is in progress. • Stockpiled material to be secure to prevent injury. • Personal Protective Equipment (PPE) must be made available to all construction workers and must be compulsory. • Hard hats and safety shoes must be worn at all times • Dust masks and ear plugs are to be worn when required. • No person must be allowed to enter the site without the required PPE. 			
Safety of Work Area	Safety	<ul style="list-style-type: none"> • Fencing and barriers will be in place in accordance with the Occupational Health and Safety Act (Act No. 85 of 1993). • Applicable notice boards and hazard warning notices will be put in place and secured. Night hazards will be indicated suitably (e.g. reflectors, lighting, traffic signage). • Maintain access control to prevent access of the public to the construction areas, as far as 	Continuous	Health and Safety Manager/ Construction manager/ ECO	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<p>practicable.</p> <ul style="list-style-type: none"> • Trenches, uncovered manholes and other excavated areas must be cordoned off and clearly demarcated. • Firefighting equipment must be placed in prominent positions in strategic locations within the entire site. Equipment must be in full, working condition and must include fire extinguishers, a fire blanket and a water tank. • Covered resting areas must be provided for workers. • Emergency contact numbers for all Emergency services, the Local Municipality and any other relevant persons must be displayed in a common area (administrative or meeting area) on site. 			
Security	Site Security	<ul style="list-style-type: none"> • No site staff, apart from security personnel and skeleton staff will be housed on site, unless authorised in the Environmental Authorisation. • Workers found to be engaging in activities such as excessive consumption of alcohol, drug use or selling of any such items on site must be disciplined accordingly. 	Continuous	Construction Management/ ECO	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<ul style="list-style-type: none"> • A boundary fence must be erected to prevent public access, for public safety and security reasons. • ECO and Contractor to ensure that only authorised personnel are on site at all times. 			
Fire	Safety	<ul style="list-style-type: none"> • Suitable precautions will be taken (e.g. suitable fire extinguishers, water bowsers, welding curtains) when working with welding or grinding equipment. • Designated smoking areas should be provided, with special bins for discarding of cigarette butts • Adhere to the emergency procedure. • Fire-fighting equipment to be kept on site. • All fire control mechanisms (firefighting equipment) will be routinely inspected by a qualified investigator for efficacy thereof. • The burning of waste is strictly prohibited. • Fire-fighting response team to be trained. • Emergency contact details should be visible on site <ul style="list-style-type: none"> ○ Gatehouses ○ Site Construction Camp 	Quarterly	Construction Manager	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
CONSTRUCTION MATERIALS AND HAZARDOUS MATERIALS (HAZMAT)					
Fuel, Oil and Chemicals	Soil and Water contamination	<ul style="list-style-type: none"> • Proper storage of hydrocarbons based on the chemical qualities of material and Material Safety Data Sheets (MSDS). At a minimum, hazardous chemical substances (HCS) must be stored at a designated area that meets the following requirements: <ul style="list-style-type: none"> ○ Earthed ○ Fire extinguisher must be present ○ Relevant signage to be displayed including No Smoking/ No open flames; Hazardous Chemical Substance Store; Type of HCS (e.g. Diesel); Maximum contents volume and Fire extinguisher. • Storage areas should be located 100m from the edge of the drainage area. • Hazardous substances must be stored and handled in accordance with the appropriate legislation and standards, which include the Hazardous Substances Act (Act No. 15 of 1973), the Occupational Health and Safety Act (No. 85 of 1993), relevant associated Regulations, and 	Continuous	Construction Manager	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<p>applicable SANS and international standards.</p> <ul style="list-style-type: none"> • Any hazardous materials (apart from fuel) must be stored within a lockable store with a sealed floor. Suitable ventilation to be provided. • All storage tanks containing hazardous materials must be placed in bunded containment areas with impermeable surfaces. The bunded area must be able to contain 110% of the total volume of the stored hazardous material. • Confinement areas (at construction camp) must be imperviously bunded with adequate containment to prevent pollution, even during periods of high rainfall. • Spillages <ul style="list-style-type: none"> ○ In the event of spillages of hazardous substances, the appropriate clean up and disposal measures are to be implemented. ○ The contractor must ensure that necessary materials and equipment are available on site to deal with spills of any hazardous materials present. 			

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<ul style="list-style-type: none"> ○ The ECO and Project Manager must be notified of all significant spillages. ○ Spilled substances must be contained in impermeable containers for removal to a licensed hazardous waste site. ○ An incident report must be completed ● Staff who will be handling Hazmat must be trained to do so responsibly. ● Drip trays must be placed under all vehicles when immobile for longer than 24 hours. Vehicles suspected of leaking must be monitored and conduct a pre start-up inspection checklist. ● Drip trays must be checked and replaced for vehicles standing (parked) for prolonged periods. ● Drip trays must be of a sufficient size and volume to collect any hydrocarbon leakages from a stationary vehicle. ● Contaminated wastewater to be contained, and removed to a registered site, to ensure water bodies on site are not contaminated. ● Significant spills should be reported to the Project Manager or Contractors Manager who 			

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		should report this to the relevant authority.			
Building Materials	Soil and Water contamination	<ul style="list-style-type: none"> • Portland cement or white cement is considered a “hazardous chemical” under OHSA, Act 85 of 1993 Reg. 11/79 dd25/08/95. Therefore, cement should not be allowed to disperse to the surrounding environment. • Cement, concrete and chemicals must be mixed on an impermeable surface to prevent contamination of the receiving environment. • Runoff from batching areas shall be strictly controlled, and water containing cement-residue shall be collected, stored and disposed of at registered disposal site. • Contaminated soil must be contained and disposed of off-site at a registered landfill site. • 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. • Empty (used) cement bags must be collected and stored in weatherproof containers to prevent air pollution by cement dust and water 	Continuous	Construction Management	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		contamination through stormwater run-off and must disposed of as hazardous waste			
VEHICLES AND ACCESS					
Smoke, Dust and Gasses Control	Atmospheric Emissions	<ul style="list-style-type: none"> • A speed limit of 20km/h must be maintained on all dirt roads. • Dust suppression by means of either water or biodegradable chemical agent is required. A provision for a minimum of twice daily dampening by water cart must be provided. 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. • All reasonable measures must be taken to minimise air emissions in the form of smoke, dust and gases. All vehicles and other machinery should comply with road worthy requirements and comply with legislation in terms of allowable 	Continuous	Construction Management/ECO	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		emissions			
Site Roads and Access	Soil Alteration	<ul style="list-style-type: none"> • 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. • Movement of vehicles outside the designated working areas shall not be permitted without authorisation from the ECO who must advise and approve the routes for the Engineer to endorse. • Access to the site is to be controlled and restricted. • 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 (if applicable). • Where existing roads to be used for access are in a poor state of repair, photographic evidence must be taken. Repairs must be completed prior to use, if required, to prevent damage to equipment and vehicles. 	Continuous	Construction Manager/ECO	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<ul style="list-style-type: none"> • Authorised clearing of access roads must be done under the supervision of the ECO. • Access roads for earthmoving equipment must be clearly demarcated and positioned as close as possible to the proposed construction area. • No driving outside of the marked roads is permitted and designated parking areas must be identified and demarcated with applicable signage. • Neither the site nor the access roads must be allowed to be used for recreational activities. Security personnel must be informed and ensure this is enforced. 			
SOCIAL RESPONSIBILITY					
Surrounding/adjacent Private Properties	Social	<ul style="list-style-type: none"> • Maintain an open channel of communication for surrounding stakeholders to raise comments and concerns. • Trespassing on adjoining properties is strictly prohibited. • Damages (as a result of negligence or accident) to private/public property must be repaired immediately and to the satisfaction of the owner. 	Continuous	Construction Manager	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
	Stormwater run-off	<ul style="list-style-type: none"> No waste water may run-off or be discharged freely onto any of the surrounding streets or naturally vegetated areas. 			
Employment	Social	<ul style="list-style-type: none"> Local contractors and suppliers to be used during the construction phase as far as possible. 	Continuous	Construction Manager	Construction
Local Community	Social	<ul style="list-style-type: none"> All contact with Interested and Affected Parties, as well as neighbours, and general public shall be courteous at all times. Compile a complaint register for recording of all comments and/or complaints raised by I&AP's. Road rehabilitation should take place as and when required, to ensure minimum inconvenience to other road users (where applicable). Construction vehicles are to use only the designated roads. Damage to infrastructure shall not be tolerated and damage is to be repaired immediately. The Contractor shall assist the PM with responding to queries and complaints from the public by: documenting details and submitting the information to the PM for inclusion in the 	Continuous	Construction Manager	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<p>complaints register; 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.</p> <ul style="list-style-type: none"> • 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 or filling up of wetlands etc. • All disturbed areas caused from construction activities must be rehabilitated effectively. • No private agreements between the contractor and the landowner will absolve the contractor from unlawful activities. • Illegal transgressions in this regard without the PM's approval will be the sole liability of the contractor and the contractor will bear the full consequences of such actions 			
HERITAGE					
Unearthing of Artefacts	Loss of cultural	<ul style="list-style-type: none"> • Should any artefacts, or items that could be identified as having cultural or heritage value, be 	Continuous	Construction Manager/ECO	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
	heritage	<p>unearthed during excavations, these items must not be disturbed or removed.</p> <ul style="list-style-type: none"> • SAHRA, as well as the Heritage Consultant must be informed of the find within 24 hours and should be involved in the removal of these if required. 			
ENVIRONMENTAL TRAINING					
General training of all staff on site		<ul style="list-style-type: none"> • Environmental Training to be provided to all persons working on site (Toolbox talks, demo's or media). See Appendix 11.3 • Topics to be covered include, <i>inter alia</i>: <ul style="list-style-type: none"> ○ Reason for conservation and protection of the environment (EMPr aim) ○ Impact of construction activities on the environment. ○ Mitigation measures in respect of these impacts. ○ Emergency spills, awareness thereof and response there to. ○ Social responsibility towards surrounding properties, owners and businesses during the construction phase of Heronbridge College 	Quarterly	Construction Manager/ ECO/ Safety Reps	Pre-Construction/ Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<p>Sports-fields</p> <ul style="list-style-type: none"> ○ Detailed discussions on sections of the EMPr highlighted as being important. ○ Explanation of the management structure and individuals responsible for matters pertaining to the EMPr. ● The Contractor shall keep a record of all environmental training sessions, including an attendance register and copies of material and information discussed. ● Training must be given prior to construction commencement on safety when dealing with wild animals such as snakes. 	<p>Continuous</p> <p>Quarterly</p>		
RESOURCE CONSUMPTION					
Electricity consumption	Resource Consumption	<ul style="list-style-type: none"> ● Enforce electricity reduction strategies <ul style="list-style-type: none"> ○ All electrical services infrastructure must be approved by City Power before implementation. ○ Use energy saving equipment like LED lights as required by SANS 10400. ○ Switch off all unused equipment ○ Promote efficient running time of 	<p>Continuous</p> <p>Quarterly</p>	Construction Manager	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
REHABILITATION AND LANDSCAPING					
Rehabilitation and landscaping activities	Loss of Habitat	<ul style="list-style-type: none"> • After the construction phase, the area to be reinstated to the same or better condition than it was prior to construction. • Clear and completely remove from site all construction plant, equipment, storage containers, temporary fencing, temporary services, and fixtures • Ensure that all access roads utilised during construction are returned to a usable state and/or a state no worse than prior to construction. • Inert waste and rubble <ul style="list-style-type: none"> ○ Clear the site of all inert waste and rubble, including surplus rock, foundations and batching plant aggregates. After the material has been removed, the site shall be re-instated and rehabilitated. ○ Remove from site all domestic waste and dispose of in the approved manner at a registered waste disposal site, or with a registered service provider. 	At end of construction phase/during rehabilitation	Construction Manager	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<ul style="list-style-type: none"> • Hazardous waste and pollution control <ul style="list-style-type: none"> ○ Remove from site all pollution containment structures. ○ Remove from site all temporary sanitary infrastructure and waste water disposal systems. ○ Take care to avoid leaks, overflows and spills and dispose of any waste in the approved manner • Control of Invasive Plant species: <ul style="list-style-type: none"> ○ Control invasive plant species and noxious weeds by means of extraction, cutting or other approved methods. ○ Encroachment of alien vegetation should be monitored regularly and controlled; the area must be kept clear of all invader plants as per the Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983). Rehabilitation measures must be employed until such a time as indigenous species are established. • As much vegetation growth as possible should be 			

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<p>promoted within the proposed replacement in order to protect soils and to reduce the percentage of the surface area which is left as bare ground. In this regard, special mention is made of the need to use indigenous vegetation species as the first choice during landscaping.</p> <ul style="list-style-type: none"> • Landscaping <ul style="list-style-type: none"> ○ Make safe all excavations outside of the construction area by backfilling and grading, as required. ○ In general, no slopes steeper than 1(V):3(H) are permitted in cut-and-fill areas, unless otherwise specified by the landscaping plan. ○ Programme the backfill of excavations so that subsoil is deposited first, followed by the topsoil. ○ Monitor backfilled areas for subsidence (as the backfill settles) and fill depressions using available material. ○ Shape the area surrounding the development to blend in with the 			

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<p>surrounding landscape, where possible. Landscaping shall be done through the use of indigenous plant species, following water conscious design principles.</p> <ul style="list-style-type: none"> • Ensure that no excavated material or stockpiles are left on site and that all material remaining after backfill is landscaped to blend in with the surrounding landscape. • Topsoil replacement and soil amelioration <ul style="list-style-type: none"> ○ Execute top soiling activity prior to the rainy season or any expected wet weather conditions. ○ Execute topsoil placement only after all construction work has ceased. ○ Replace and redistribute stockpiled topsoil together with herbaceous vegetation, overlying grass and other fine organic matter in all disturbed areas of the construction site, including temporary access routes. Replace topsoil to the original depth. 			

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<ul style="list-style-type: none"> ○ Place topsoil in the same area from where it was stripped. If there is insufficient topsoil available from a particular soil zone to produce the minimum specified depth, topsoil of similar quality may be brought from other areas of similar quality. ○ The suitability of substitute material will be determined by means of a soil analysis addressing soil fraction, fertility, pH and drainage. ○ Do not use topsoil suspected to be contaminated with the seed of alien vegetation. Alternatively, the soil is to be appropriately treated. ○ Ensure that storm water run-off is not channelled alongside the gentle mounding, but that it is taken diagonally across it. ○ Shape remaining stockpiled topsoil not utilised elsewhere in an acceptable manner so as to blend in with the local 			

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<p>surrounding area.</p> <ul style="list-style-type: none"> ○ After topsoil placement is complete, spread available stripped vegetation randomly by hand over the top-soiled area ● Ripping and scarifying <ul style="list-style-type: none"> ○ Rip and/or scarify all areas following the application of topsoil to facilitate mixing of the upper most layers. Whether ripping and/or scarifying is necessary will be determined based on the site conditions immediately before these works begin. ○ Rip and/or scarify all disturbed areas (and other specified) 			
Rehabilitation of Water Drainage area.	Impact on watercourse (Drainage area)	<ul style="list-style-type: none"> ● Rehabilitation of Water Drainage area. <ul style="list-style-type: none"> ○ All conditions stipulated in the Water Use License must be strictly adhered to. ○ Rehabilitation must be implemented in accordance with the Aquatic Resources Rehabilitation Plan. ● Removal of un-natural materials form drainage 	During rehabilitation of the water drainage area (to be undertaken once the	Construction Manager	Construction

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<p>area:</p> <ul style="list-style-type: none"> ○ A suitably registered 3rd party contractor must be employed to collect and remove all un-natural materials from the drainage area. ○ Disposal of this waste must be undertaken at an appropriate registered landfill. ○ Proof of collection and safe disposal/ processing must be presented and kept on file. ○ Quantities of material removed off-site must be monitored and kept on file. ○ No chemicals or hydrocarbons may be stored or placed within this area. ○ All plant equipment used during rehabilitation must be thoroughly inspected beforehand to prevent any hydrocarbon spills within sensitive area. ○ All alien vegetation must be removed and disposed of off-site ○ The surrounding area must be 	<p>GAWUL has been approved)</p>		

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<p>revegetated with natural vegetation found within drainage areas of the region.</p> <ul style="list-style-type: none"> ○ The topography of the drainage area must be restored to its natural state. • Ensure that all access roads utilised during rehabilitation are returned to a usable state and/or a state no worse than prior to rehabilitation. • Inert waste and rubble <ul style="list-style-type: none"> ○ Clear the site of all inert waste and rubble, including surplus rock, foundations and batching plant aggregates. After the material has been removed, the site shall be re-instated and rehabilitated. ○ Remove from site all domestic waste and dispose of in the approved manner at a registered waste disposal site, or with a registered service provider. • Hazardous waste and pollution control <ul style="list-style-type: none"> ○ Remove from site all pollution 			

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<p>containment structures.</p> <ul style="list-style-type: none"> ○ Remove from site all temporary sanitary infrastructure and waste water disposal systems. ○ Take care to avoid leaks, overflows and spills and dispose of any waste in the approved manner ● Control of Invasive Plant species: <ul style="list-style-type: none"> ○ Control invasive plant species and noxious weeds by means of extraction, cutting or other approved methods. ○ Encroachment of alien vegetation should be monitored regularly and controlled; the area must be kept clear of all invader plants as per the Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983). Rehabilitation measures must be employed until such a time as indigenous species is established. ○ As much vegetation growth as possible should be promoted within the proposed replacement in order to protect soils and 			

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<p>to reduce the percentage of the surface area which is left as bare ground. In this regard, special mention is made of the need to use indigenous vegetation species as the first choice during landscaping</p> <ul style="list-style-type: none"> • Landscaping <ul style="list-style-type: none"> ○ Make safe all excavations outside of the rehabilitation area by backfilling and grading, as required. ○ In general, no slopes steeper than 1(V):3(H) are permitted in cut-and-fill areas, unless otherwise specified by the landscaping plan. ○ Programme the backfill of excavations so that subsoil is deposited first, followed by the topsoil. ○ Monitor backfilled areas for subsidence (as the backfill settles) and fill depressions using available material. ○ Shape the area surroundings to blend in with the surrounding landscape, where 			

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<p>possible. Landscaping shall be done through the use of indigenous plant species, following water conscious design principles.</p> <ul style="list-style-type: none"> • Topsoil replacement and soil amelioration <ul style="list-style-type: none"> ○ Execute top soiling activity prior to the rainy season or any expected wet weather conditions. ○ Screen and Replace and redistribute stockpiled topsoil together with herbaceous vegetation, overlying grass and other fine organic matter in all disturbed areas of the rehabilitation site, including temporary access routes. Replace topsoil to the original depth. ○ Place topsoil in the same area from where it was stripped. If there is insufficient topsoil available from a particular soil zone to produce the minimum specified depth, topsoil of similar quality may be brought from other areas of similar quality. 			

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<ul style="list-style-type: none"> ○ The suitability of substitute material will be determined by means of a soil analysis addressing soil fraction, fertility, pH and drainage. ○ Do not use topsoil suspected to be contaminated with the seed of alien vegetation. Alternatively, the soil is to be appropriately treated. ○ Ensure that stormwater run-off is not channelled alongside the gentle mounding, but that it is taken diagonally across it. ○ Shape remaining stockpiled topsoil not utilised elsewhere in an acceptable manner so as to blend in with the local surrounding area. ○ After topsoil placement is complete, spread available stripped vegetation randomly by hand over the top-soiled area 			

6.3 Environmental Management and Mitigation Measures – Operational Phase

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
DUST EMISSIONS					
General Maintenance Gardening Landscaping	Dust Emissions	<ul style="list-style-type: none"> Landscaping of all areas to prevent dust creation. 	As required	Site Manager	Operational
DRAINAGE AREA					
General Maintenance Gardening Landscaping	Water quality	<ul style="list-style-type: none"> Landscaping of all areas to prevent soil erosion and resultant siltation of water courses. Stormwater management system to be implemented in line with stormwater management plan. Prevent anyone from entering the sensitive drainage area. 	As required	Site Manager	Operational
General Maintenance Gardening Landscaping	Disturbance of natural system	<ul style="list-style-type: none"> Designated drainage no-go area must be maintained. 	On going	Site Manager	Operational
STORMWATER					
Stormwater Management	Discharge to water	<ul style="list-style-type: none"> Stormwater management system must be maintained at all times Attenuation pond must be well maintained. 	Monthly	Site Manager	Operational

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
GROUNDWATER					
Impact to regional water balance	Use of boreholes during operation	<ul style="list-style-type: none"> • Based on Outline Scheme Report, general use of the borehole should be limited to 255kl/day. Maximum use should be limited to 255kl/day or the DWS authorised volume (if different). • The requirements of the WUL in regards to groundwater abstraction should be complied with. • Groundwater abstraction should only be undertaken once WUL is in place. 	On going	Site Manager	Operational
Impacts to groundwater quality	Operational activities (Landscaping Sewage Treatment, Stormwater management, Management of chemicals for treatment of pool)	<ul style="list-style-type: none"> • Correct maintenance of the sewage treatment plant to be implemented. • Approved sewage treatment plant to be put in place. • The requirements of the WUL in regards to grey water quality monitoring should be complied with. • Operation of the sewage treatment plant should only be undertaken once WUL is in place. • Proper management of spills. • Also, see general activities under management of surface water quality and hazardous material during operation. 	On going	Site Manager	Operational

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
WASTE MANAGEMENT					
Solid Waste Management	Domestic waste	<ul style="list-style-type: none"> • Management of waste must be aligned with the Waste Management Plan • Sufficient labelled or colour coded bins with lids are to be available on site. • Litter must be collected and put into suitable closed bins on a daily basis. • Notice boards must be placed on site to inform the students of the importance of sorting and recycling waste. 	Continuous	Site Manager	Operational
Sewage sludge	Waste generation – sewage treatment	<ul style="list-style-type: none"> • Desludging of the sewage treatment facility must be undertaken as required by the design specifications of the facility • Sludge must be collected by a 3rd party contractor suction-tanker and taken to a registered disposal facility. • Management and maintenance of the sewage treatment works must be by an experienced and competent person. • Water quality monitoring to be undertaken as per the requirements of the WUL. 	Ongoing	Site Manager	Operational

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
Effluent Waste Management	Grey Water	<ul style="list-style-type: none"> • Grey water quality used for irrigation must be monitored in terms of the requirements of the WUL. Records of all monitoring must be kept and provided to DWS as required. • Water quantities used for irrigation must be monitored in terms of the requirements of the WUL. Records of all monitoring must be kept and provided to DWS as required. • Grey water Quality must remain within the parameters set within the WUL. • In the event of exceeding the parameters set in the WUL, all irrigation must cease immediately until water quality outputs can return to set parameters. 	Ongoing	Site Manager	Operational
HEALTH, SAFETY & SECURITY					
Safety of people on site	Safety	<ul style="list-style-type: none"> • Machinery and equipment used for maintenance must be maintained in a safe operating condition. • A complete, appropriate First Aid Kit must be available on site. • Sufficient, appropriately qualified medical personnel must be present during any events. • No student or parent is allowed within the attenuation pond. 	Continuous	Site Manager	Operational

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		<ul style="list-style-type: none"> An emergency response plan for events should be compiled. The drainage area must remain strictly off-limits to anyone. Speed limit signs must be placed on internal road areas. Vehicles must be limited to designated parking areas. 			
Safety of Work Area	Safety	<ul style="list-style-type: none"> Firefighting equipment must be placed in prominent positions in strategic locations within the entire site. Equipment must be in full, working condition. Emergency contact numbers for all Emergency services, the Local Municipality and any other relevant persons must be displayed in a common area (administrative or meeting area) on site. 	Continuous	Site Manager	Operational
Security	Site Security	<ul style="list-style-type: none"> No site staff, apart from security personnel and skeleton staff will be housed on site, unless authorised in the Environmental Authorisation. Workers found to be engaging in activities such as excessive consumption of alcohol, drug use or selling of any such items on site must be 	Continuous	Security	Operational

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		disciplined. <ul style="list-style-type: none"> • A boundary fence must be erected to prevent public access, for security reasons. • Security to ensure that only authorised personnel are on site at all times. • Appropriate lighting must be erected in strategic areas like the parking area. 			
Fire	Safety	<ul style="list-style-type: none"> • Fire-fighting equipment to be kept on site 	Continuous	Site Manager	Operational
RESOURCE CONSUMPTION					
General activities within residential area	Excessive electricity and water consumption	<ul style="list-style-type: none"> • Promote effective electricity and water consumption and sustainable alternatives. 	Continuous	Site Manager	Operational
SOCIAL RESPONSIBILITY					
Surrounding/adjacent Private Properties	Social Stormwater run-off	<ul style="list-style-type: none"> • Maintain an open channel of communication for surrounding stakeholders to raise comments and concerns. • Damages (as a result of negligence or accident) to private/public property must be repaired immediately and to the satisfaction of the owner. • No waste water may run-off or be discharged freely onto any of the surrounding streets or 	Continuous	Site Manager	Operational

Project Activity	Impact	Proposed Mitigation Measures	Frequency	Institutional Responsibility	Timeframes
		naturally vegetated areas.			
Local Community	Social	<ul style="list-style-type: none"> All contact with Interested and Affected Parties, as well as neighbours, and general public shall be courteous at all times. 	Continuous	Site Manager	Operational

Table 6-1: Additional management measures not associated with identified impacts.

Activity	Mitigation Measures
Document control	<ul style="list-style-type: none"> • A copy of the following documentation must be kept at the site: <ul style="list-style-type: none"> ○ Environmental Management Programme (EMPr) ○ Environmental training attendance registers and/or material and/or log of topics discussed ○ Waste manifest documents ○ Environmental Authorisation ○ Water Use License ○ Monitoring data ○ Complaints register and/or incident reporting
Method Statements	<ul style="list-style-type: none"> • Based on the EMPr, the contractor must compile specific method statements which must be approved by the Project manager prior to construction. At a minimum this should include: <ul style="list-style-type: none"> ○ Method Statement for site clearing; ○ Method Statement for establishing the construction camp; ○ Method Statement with regard to waste and wastewater management; ○ Method Statement to show procedures for dealing with possible emergencies that can occur, such as fire and accidental leaks and spillage of carbon fuels and oils; ○ Method Statement for dust control; ○ Method Statement for the storage and handling of hazardous substances; ○ Method Statement for controlling alien invasive species and noxious weeds; and ○ Method Statement for rehabilitation of construction footprint and drainage area.
Waste management	<ul style="list-style-type: none"> • Bins must be clearly labelled or colour coded according to waste type • Sorting of waste must be conducted by the residents and the maintenance staff. • Ensure that the bins are collected / emptied weekly

Activity	Mitigation Measures
	<ul style="list-style-type: none"> • Proof of appropriate disposal records must be kept on site
Complaints	<ul style="list-style-type: none"> • All complaints must be recorded in a register on site and be available for inspection by the competent authority upon request. • Meetings with the adjacent landowners and affected parties should be held if required
Environmental Awareness & Training	<ul style="list-style-type: none"> • ECO to induct relevant contractor managers at the start of the project. This induction should provide an overview of the authorisation and the EMPr. The environmental awareness training course for management shall include all management and foremen. • The Contractor must arrange that all of his employees and those of his sub-contractor go through the project specific environmental awareness induction before the commencement of construction and as and when new staff or sub-contractors are brought on site. • A system must be in place to ensure all new employees have received training. • All attendees shall remain for the duration of the course and sign an attendance register that clearly indicates participant's names on completion. A copy of the attendance register is to be retained by the Environmental Officer. • In addition, the following types of environmental awareness training must be undertaken: <ul style="list-style-type: none"> ○ Waste management ○ Spillages ○ Saving water ○ Electricity consumption ○ Dust control ○ Noise generation ○ Housekeeping ○ Indigenous Vegetation and fauna

Activity	Mitigation Measures
	<ul style="list-style-type: none">○ Alien vegetation○ Fire-making○ General implementation of good environmental practices including implementation of the Environmental awareness plan
Emergencies	<ul style="list-style-type: none">● An emergency response plan should be compiled.● In the event of an emergency, follow the emergency response plan

7 ENVIRONMENTAL AWARENESS PLAN

Heronbridge College NPC is committed to remain responsible and accountable for environmental practices on site. Being accountable for environmental practices undertaken during construction activities remain the responsibility of both employer and employee and being aware 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 (for new employees)
- EMP training (annually)

7.1 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
- General environmental awareness:
 - Waste management
 - Spillages
 - Saving water
 - Electricity consumption
 - Dust control
 - Noise generation
 - Housekeeping
 - Indigenous Vegetation
 - Alien vegetation
 - Fire-making

7.2 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
- Safety topics

7.3 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. The following applies:

- ECO to induct relevant contractor managers at the start of the project. This induction should provide an overview of the authorisation and the EMPr. The environmental awareness training course for management shall include all management and foremen.
- The Contractor must arrange that all of his employees and those of his sub-contractor go through the project specific environmental awareness induction before the commencement of construction and as and when new staff or sub-contractors are brought on site.
- A system must be in place to ensure all new employees have received training.
- All attendees shall remain for the duration of the course and sign an attendance register that clearly indicates participant's names on completion. A copy of the attendance register is to be retained on site.

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:WA¹ or NWA²)
- Constitutional right pertaining to the environment
- Environmental, social and economic concerns
- Mitigation relating to the EMPr

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 WASTE MANAGEMENT PLAN

In order to ensure waste is properly dealt with, waste management is included in the EMPr. In addition, a **Waste Management Plan** is discussed below.

8.1 Legal Requirements

Section 16 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), as amended states that –

“A holder of waste must, within the holder’s power, take all reasonable measures to –

- *Avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated;*
- **Reduce, reuse, recycle and recover waste;**
- *Where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;*
- *Manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts;*
- *Prevent any employee or any person under his or her supervision from contravening this Act;*
- *Prevent the waste from being used for any unauthorised purpose.*

Only temporary storage of waste is allowed (once of storage of waste for a period less than 90 days). The volume of material should be limited to less than 100m³ of general waste and less than 80m³ of hazardous waste. Should this be exceeded the Norms and Standards for the Storage of Waste will need to be complied with.

8.2 Waste Hierarchy

Management objectives provided in this EMPr are aligned to the waste management hierarchy indicated in Figure 8-1.

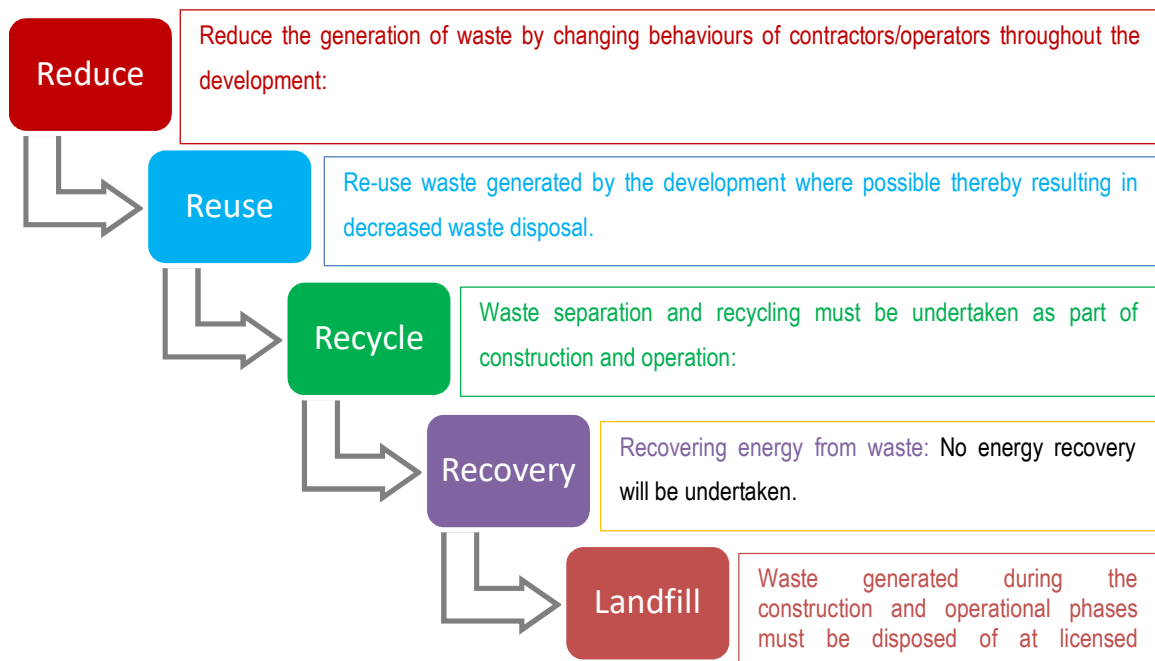


Figure 8-1: Waste Hierarchy.

8.3 Waste Management Actions

The following waste management actions must be implemented in order to ensure the objectives included in the waste hierarchy above are met.

8.3.1 Waste Avoidance and Reduction

Avoidance and reduction should be practiced wherever possible. Recommended actions include: but are not limited to:

- Bulk buying of materials to reduce the volume of packaging required.
- Avoidance of materials/items/brands that are heavily packaged, have a short lifespan or are low quality.
- Buying items that last longer and can be repaired.
- Buying items in refillable containers.
- Environmental awareness training should focus on management of waste and all construction workers should be aware of the importance of waste minimisation and avoidance.

8.3.2 Recycling

Recycling should be practiced whenever waste prevention or reuse is not possible, provided that any such recycling is cost effective, taking into consideration environmental benefits, financial costs and community interests.

Potential priority recyclable waste streams include:

- Used Oil;
- Paper;
- Glass;
- Tyres;
- Plastics;
- Building rubble; and
- Electronic waste.

The following actions must be implemented:

- To reduce or avoid the need for sorting after collection, the categories of distinctively marked waste receptacles must be provided in order to receive waste as it is generated.
- These receptacles shall be fitted with a tight cover.
- All types of waste collection receptacles shall be clearly marked with the type of waste they are receiving.
- Obtain and label recycling containers for office waste, aluminium, steel, glass, ferrous metals, nonferrous metals, waste timber.
- Locate these containers within office buildings and trailers.
- Establish a recycled material collection schedule.
- Arrange full bins to be hauled away.

8.3.3 Waste Disposal

The contractor is responsible for removal of all waste from the site, generated through the contractor's activities. The contractor shall ensure that all waste is removed to an appropriate, licensed waste management facilities (the following source may be utilised – www.sawic.org.za). All waste removed from the drainage area during the rehabilitation phase, must be disposed or collected by registered facility. During operation, waste that is not collected for recycling must be collected by the municipality or by a municipality approved 3rd party collector.

In addition, it should be noted that the classification of waste determines the handling methods and the ultimate disposal of the material. All **hazardous waste** that may be generated by construction and operation must be managed as follows:

- Characterise the waste to determine if it is general or hazardous (Use the Appendix 1 of the Norms and Standards for the Classification of Waste for landfill to determine whether additional classification is required).
- Obtain and provide an acceptable container with a label.
- Place hazardous waste material in the container.

- Inspect the container on a regular basis.
- Haul the full container to the licenced and correct disposal site.
- Provide documentary evidence of proper disposal of the waste.

In addition, the following actions must also be undertaken:

- Provide waste skips on site. These skips should be sufficient in number, the skip storage area should be kept clean, skips should be emptied and replaced before overflowing or spillage occurs.
- Skips should be covered to prevent waste blowing away.
- Vermin / weatherproof bins will be provided in sufficient numbers and capacity to store domestic waste. These bins must be kept closed to reduce odour build-up and emptied regularly to avoid overfilling and other associated nuisances.
- Ensure that solid waste is transported so as to avoid waste spills on-route.
- No waste shall be buried or burned anywhere on the site.
- Permits to transport/dispose of waste must be in place.

9 EMERGENCY PREPAREDNESS PLAN

9.1 Potential Emergencies

The following potential emergencies that may occur on site include:

- Environmental Incidents:
 - Fuel and hydrocarbon spillages
 - Fire Hazards
- Safety Incidents:
 - Injuries related to operation of heavy machinery such as Front-End Loaders, Excavators, etc.
 - Driving related accidents and incidents from Tipper Trucks on site
 - Accidents during earth moving and levelling activities
 - Criminal incidents such as theft or potential violent crime
- Operational Safety Incidents:
 - Incidents and injuries occurring during school and sport events.

9.2 Emergency Plan

9.2.1 Emergency Assemblage Area

A central area on site must be demarcated with appropriate signage for the gathering of all employees and visitors on site in the event of an emergency.

9.2.2 Emergency Procedures

The following procedures must be compiled in order for the identified potential emergencies to be managed effectively:

- Drill and evacuation procedure for any emergency related incidents containing information on the following:
 - Reporting structure for all incidents
 - Emergency contact information (e.g. telephone numbers)
 - Procedure to be followed for the specific emergency
 - First Aid information
- Emergency procedure for any emergency related incidents during operation (i.e. sport or school events) containing information on the following:
 - Reporting structure for all incidents
 - Emergency contact information (e.g. telephone numbers)
 - Procedure to be followed for the specific emergency
 - First Aid information
- Spillages of fuel and hydrocarbons:
 - Immediate action plan (e.g. use of spill kits) to prevent spill for spreading
 - Reporting of incident to manager and supervisor to advise on next steps
- Procedure for Theft and Crime:
 - Details on security system on site
 - Emergency response units
 - Panic alarms

9.2.3 Emergency Contact Information

A list of potential emergency contact centers specific to the area must be drawn up and displayed on common notice boards for all employees to access. The following emergency centers must be sourced:

- Nationwide emergency response
- Cellphone Emergency
- Ambulance
- Hospitals

- Fire Response
- Police
- Snake handler

This list must be checked and updated at least quarterly to ensure that the information remains up to date.

10 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 noncompliance 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 client 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:
 - Inadequate and poor dust control.
 - Illegal activities.

- On-going, repeated non-conformances.
- Failure to provide adequate waste disposal certificates.

11 ACCEPTANCE

DECLARATION OF UNDERSTANDING BY THE DIRECTOR OF HERONBRIDGE COLLEGE

I, _____

Representing _____

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

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness 2: _____

12.APPENDICES

12.1. Company Profile & Curriculum Vitae



COMPANY PROFILE



**10 YEARS OF
SUSTAINABLE
GROWTH
2015**

Environmental Consultants
Environmental Auditors
Aquatic & Wetland Specialists
Ecological Specialists
Air Quality Specialists
License Application Facilitators
Mining Consultants
Environmental Legislation Consultants

Company Overview

Prism Environmental Management Services (Pty) Ltd is a multi-disciplinary Environmental Management consulting firm. With a vision encompassing a holistic understanding of integrated environmental management in partnership with sustainability, the company prides itself on excellent service and value-added solutions to a range of clients. Established in 2005, the company has grown from strength to strength, expanding to two offices with a team of professionals with a diverse range of specialities.

With exceptional field-expertise, command and execution of the relevant legislative requirements and report quality, the company is recognised by clients, fellow consultants, and various Local and Provincial Authorities as a prominent service provider in our field of consulting.

Our Vision, Mission and Commitment

OUR VISION

Sustainability through Environmental Management Excellence.

OUR MISSION

Prism Environmental Management Services is a specialist environmental services provider, assuring excellence in environmental resource assessment and management. We stand in partnership with our clients, our employees, the community and the environment. Our ambition is to conserve resources, preserve natural habitats and prevent significant environmental impacts, by means of sustainable utilisation of our precious natural resources.

OUR COMMITMENT

The management and staff of Prism Environmental Management Services are committed to:

- Continued improvement of our customer relationships, ensuring customer satisfaction and superior service levels
- Providing professional and purposeful services at all times
- Following appropriate procedures to ensure the correct management and ongoing building of a sustainable environment
- Ongoing development of our staff to meet the challenges of our market
- Utilising experienced, well trained and technically competent staff
- To be dynamic in all dealings with our customers, colleagues and the environment
- Providing multi-faceted services to our clients through our variety of specialist disciplines; and
 - Embracing honesty, trust, teamwork, diversity and relationships that are beneficial to all involved.

Experience

The team at Prism EMS has extensive experience in Integrated Environmental Management (IEM) having completed numerous Basic Assessment Reports, Environmental Scoping Reports, Environmental Impact Assessments (EIA's) and Environmental Management Plans (EMP's) in terms of the National Environmental Management Act, 1998 and the National Environmental Management: Waste Act, 2008 as well as a wide range of specialist studies for a range of authorisation applications. Prism EMS is also involved in assisting various town planners and prominent developers with EIA applications, EMP's, Open Space Management Plans, Riverine- and Wetland Assessments and Delineations, Riverine and Wetland Management Plans, Ecological Studies, Air Quality Impact Assessments and other specialist studies. The consultancy also facilitates Water Use License Applications (WULAs).



With global emphasis placed on aquatic resources and the conservation thereof, it is important to know that Prism EMS are specialists in the field of assessment, delineation, management and conservation of aquatic resources. Our highly qualified team has extensive knowledge of aquatic fauna and flora and have completed numerous wetland- and riverine assessments and delineations. Members of our team are acknowledged as leaders in the field of wetland assessment and delineation by peers and authorities alike.

Auditing and on-site monitoring also form part of the range of services the consultancy offers – be it environmental control officers (ECOs) during the construction phase of developments, environmental monitors (EMs) for the project engineering team on sites, or environmental officers (EOs) for contractors. The common goal aimed at, and achieved within these roles, is the overseeing, implementation and compliance with the Environmental Authorisation (EA) and EMP.

Consultants in our team have in-depth experience in the environmental component of the mining industry, regulated by the Mineral and Petroleum Resources Development Act, 2002 and with strong emphasis on the National Water Act, 1998, and National Environmental Management Act, 1998. Services offered to the mining industry include, but are not limited to, Closure Plans, Rehabilitation Fund Calculation, Basic Assessments, Environmental Impact Assessments, Environmental Management Plans, Environmental Management Implementation, Performance Assessments, Water Use License Applications, Bio-diversity Assessments and various Specialist Assessments as part of EMP amendments and new mining activities.

Prism EMS has also expanded its services to encompass the Air Quality field. The consultancy and its associates are able to conduct Air Quality Impact Studies, Air Emissions modelling and also facilitate Air Emissions Licensing (AEL).

To summarise, Prism EMS is an accomplished consultancy, confident that we can successfully fulfil client requirements, from project planning to completion. The multi-faceted character of the company is evident from the range of disciplines abridged below.



Scope of Services

ENVIRONMENTAL IMPACT MANAGEMENT

- Environmental Impact Assessments (EIAs)
- Basic Assessment processes & Reports (BARs)
- Environmental Management Plans (EMPs)
- Site-specific EMPs
- Water Use License Applications (WULAs)
- Waste License Applications
- Air Emissions Licenses

ENVIRONMENTAL PLANNING

- Environmental Management Systems (conforming to ISO 14001)
- Environmental Site Selections and Planning at Pre-Feasibility Phase
- Environmental Procedures and Environmental Specifications

ENVIRONMENTAL AUDITING & MONITORING

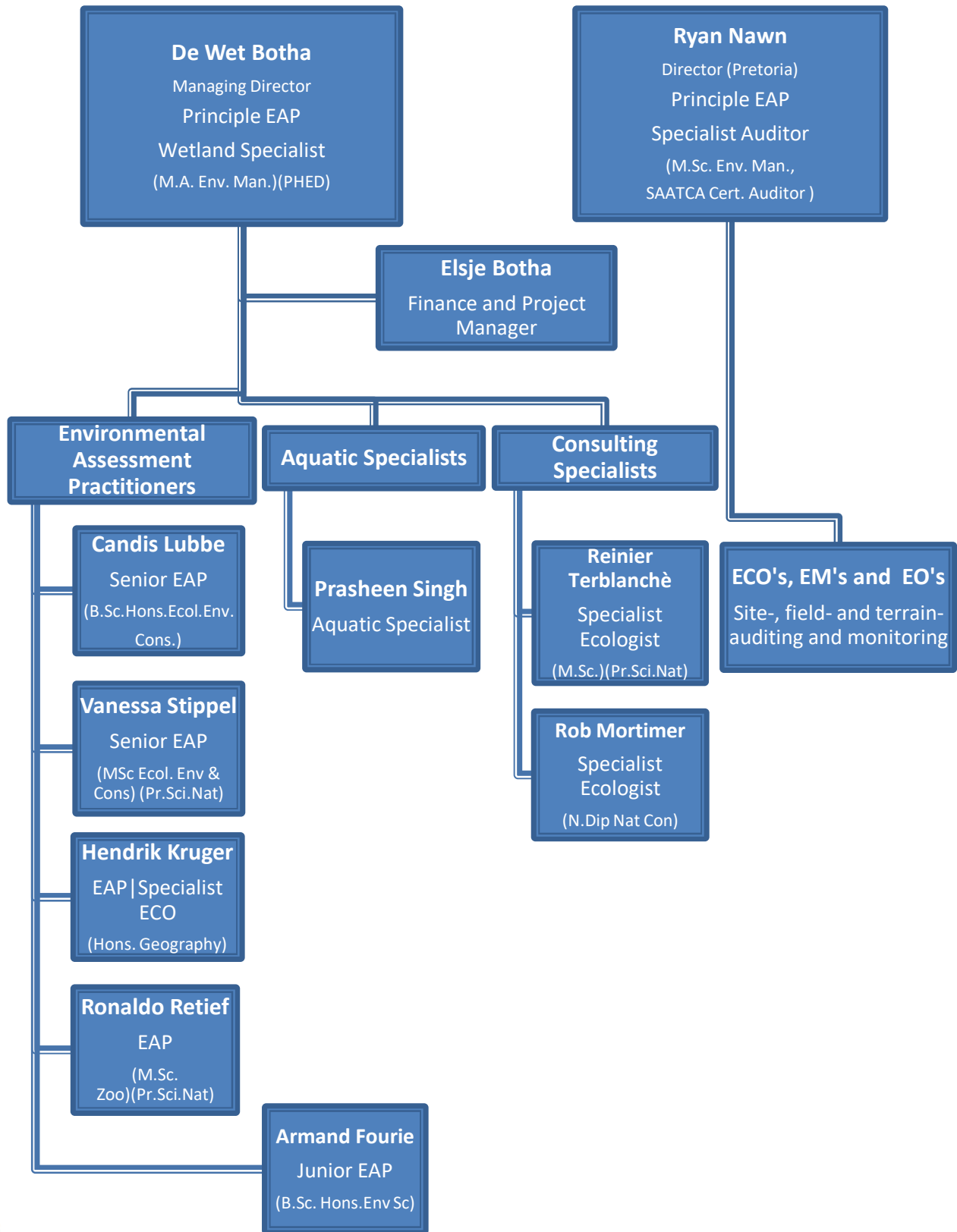
- ISO 14001 Environmental Management Systems
- Environmental Authorisations (and previous RoDs)
- Environmental Management Plans and Programmes for construction projects and mining
- Water Use Licenses
- Waste Licenses
- Green Building developments (conforming to MANUAL-6 & MANUAL-7 of the GBCSA requirements for Green Building)
- All levels of Environmental Monitoring & Control for construction projects representing Clients as:
 - Environmental Officer
 - Environmental Monitor
 - Independent Environmental Control Officer (ECO)

Specialist Solutions

The list of specialist services we offer and facilitate includes, *inter alia*, the following:

- Ecological Habitat Assessments
- Aquatic Health Assessments (including SASS5)
- Wetland and Riparian Habitat assessments and delineation
- Rehabilitation plans and mitigatory strategy
- Aquatic and Ecological Monitoring Plans
- Bio-monitoring
- Biodiversity action plans
- Grassland rehabilitation
- Ridge Studies
- Air Quality Impact Assessments
- Geographic Information System (GIS) mapping
- Sensitivity mapping
- Legislation and process guidance
- Policy Development
- Open Space Management Plan (OSMP)
- Public Participation Processes
- EIA Review
- Specialist Auditing
- In terms of Mining Activities we facilitate:
 - Prospecting Right Applications
 - Prospecting Environmental Management Plans
 - Mining Right Applications
 - Closure Applications
 - Closure Cost Calculations
 - Annual Performance Audits (against relevant permits and licenses)

Company Organogram



Contact Us

Johannesburg:	Pretoria:
Tel No: 087 985 0951	Tel No: 012 342 2974
Fax No: 086 601 4800	Fax No: 086 552 1590
E-mail: prism@prismems.co.za	E-mail: prismpretoria@prismems.co.za
Unit 17 Coldstream Office Park	89 Burns Street
Coldstream Street	Colbyn
Little Falls	Pretoria

Visit our website www.prismems.co.za

or find us on Social Media:



PRISM
ENVIRONMENTAL MANAGEMENT SERVICES

Curriculum Vitae: Mr A Fourie

Name : **FOURIE, ARMAND**
Date of Birth : 12 July 1992
Profession/Specialisation : Environmental Practitioner
Nationality : South African
Years' experience : 2

Key Experience

Armand Fourie has 2(2) years' working experience as an Environmental Impact Practitioner includes with additional experience in Environmental Control Officer.

He is currently in the process of completing my master's degree in Environmental Management and Global Information systems (GIS). He has limited experience in environmental Auditing and Environmental Control officer duties. He has participated in national environmental conference presentations (IAIAsa) and university lectures (NWU).

Key Qualifications

Bachelor of Science in Environmental and Biological Sciences.
North- West University (NWU).

Honours Bachelor of Science in Environmental Science.
North- West University (NWU)

Supplimentary Training

- **Introduction to GIS (2014)**
ESTRI online.

Employment Record

January 2015 – August 2015	North West University Lecturer Intern
September 2015 – December 2015	Green-Scene Environment Environmental Control Officer

Professional Affiliations

- International Association Impact Assessment (IAIA): 2013-2017.
- SACNASP- Cand.Sci.Nat. (116705)

herewith certifies that

Armand Fourie

Registration number: 116705

is registered as a

Candidate Natural Scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice (Schedule 1 of the Act)

Environmental Science

Effective **09 November 2016**

Expires **31 March 2017**



President

Executive Director

Curriculum Vitae: Mrs V Stippel

Name : **STIPPEL, VANESSA JEAN**
Date of Birth : 30 August 1984
Profession/Specialisation : Senior Environmental Consultant
Nationality : South African
Years' experience : 5

Key Experience

Vanessa Stippel has five (5) years' working experience as a senior environmental consultant and is registered with the South African Council for Natural Scientific Professions as a Professional Natural Scientist (Pr.Sci.Nat. Reg No. 116221) in the field of Environmental Science. Key experience includes managing large Environmental Impact Assessments (EIAs) for Strategic Infrastructure Projects including the Berth 203 to 205 Expansion EIA and the NATREF Clean Fuels II EIA as well as Resource Management Plans (RMPs) for prioritised State Dams. She is well versed in environmental legislation and has been involved in the compilation of legal registers for organisations such as the Johannesburg City Parks and Zoo. Additional experience comprises of environmental auditing for projects such as Mooi Mgeni Transfer Scheme Phase 2 and the Orange River Water Resource Development Project –Phase 2c as well as the Technical Audit of the Sasol Chemical Industries and Sasol Mining Waste Storage Facilities in Sasolburg.

Key Qualifications

MASTER OF SCIENCE IN ANIMAL, PLANT AND ENVIRONMENTAL SCIENCE (2013)

University of the Witwatersrand

BACHELOR OF SCIENCE (HONOURS) IN ECOLOGY, ENVIRONMENT AND CONSERVATION (2006)

University of the Witwatersrand

BACHELOR OF SCIENCE (2005)

University of the Witwatersrand

Employment Record

September 2016 – Current	Prism Environmental Senior Environmental Consultant
August 2011 – August 2016	Nemai Consulting Senior Environmental Consultant

Project Experience

Environmental Authorisation Process (BA, EIA, WL, WULA):

- Steyn City Properties: EIA and WULA for Riverside View Extension 72 to 75: 2017
- Steyn City Properties: Amendment of Steyn City WULA: 2017
- South Africa Happy Island Water World (Pty) Ltd: EIA and WULA for the Proposed Development of a Water Park in Rietfontein, Mogale City. 2016 – 2017.
- Gauteng Department of Human Settlements: Scoping and EIA and WULA for the proposed Syferfontein Mixed Use Housing Development, 2014 – 2016.
- Proplan: Scoping and EIA for the proposed Rustenburg Waste Treatment Facility, 2013 – 2016.
- Ekurhuleni Metropolitan Municipality: Scoping and EIA for the proposed Esselen Park Housing Development, 2015- 2016.

- Ekurhuleni Metropolitan Municipality: Basic Assessment for the proposed Esther Park Housing Development, 2015 – 2016.
- Ekurhuleni Metropolitan Municipality: Basic Assessment for the proposed Pomona Estates Housing Development, 2015 – 2016.
- RBIDZ SOC: Scoping and EIA an WULA for the proposed Richards Bay Industrial Development Zone Phase 1F. 2014- 2016.
- Mangaung Metropolitan Municipality: Scoping and EIA for the proposed Relocation of Bloemfontein Zoo, 2015 – 2016.
- Transnet Capital Projects: Scoping and EIA for Deepening, Lengthening and Widening of Berth 203 to 205, Pier 2, Container Terminal, Port of Durban, 2012 – 2015.
- Wesizwe Platinum Resources: Basic Assessment and WULA for the proposed Ledig Water Supply Pipeline, 2014 – 2015.
- City of Tshwane Metropolitan Municipality: Scoping and EIA for the proposed new Hennops Wastewater Treatment Works (WWTWs), 2012.
- City of Tshwane Metropolitan Municipality: Scoping and EIA for the Upgrade of the Sunderland Wastewater Treatment Works, 2012.
- Transnet Freight Rail: Basic Assessment and Waste License Application for the proposed remediation of 600km of asbestos contaminated land on Transnet Properties – Group A (Port Elizabeth to De Aar), 2011 - 2012.
- Mpumalanga Department of Sports and Recreation: Scoping and EIA for the proposed High Altitude Training Facility in Mpumalanga, 2011 - 2012.
- Sasol Chemical Industry: Waste License Applications for Sasol Chemical Industries sites in Sasolburg, 2012 - 2013.
- Sasol Chemical Industry: Scoping and EIA for the Proposed NATREF Clean Fuels II, 2012 – 2013.

Section 24G Applications:

- Ekurhuleni Metropolitan Municipality: Weltevreden Material Recycling Facility, 2013.

Mining/Prospecting Applications, EMPLans and Amendments:

- Transnet National Port Authority: Mining Right and EIA for Offshore Sandwinning for developments within the Port of Durban, 2016.

Audits (Legal, RoD Compliance / Internal):

- Letamo Game Farm: Environmental Compliance Audit for Letamo Game Farm. 2016.
- TCTA: Environmental Audit of the Orange River Water Resource Development Project –Phase 2c, 2013 – 2016.
- Johannesburg City Parks and Zoo: Compilation of the Legal Register and Legal Compliance Audit for Johannesburg City Parks and Zoo, 2015.
- University of Mpumalanga: Environmental Legal Compliance Audit for the University of Mpumalanga. 2015.
- Sasol: Technical Audit of the Sasol Chemical Industries and Sasol Mining Waste Storage Facilities; Sasolburg, 2014.
- TCTA: Environmental Audit of the Mooi Mgeni Transfer Scheme – Phase 2, 2012.
- MSW: Environmental Control Officer – Joe Slovo Low Level Bridge, Modimolle, 2012.

Other:

- Dr Kenneth Kaunda District: Dr Kenneth Kaunda District Environmental Management Framework, 2014 – 2015.
- uMzinyathi District: uMzinyathi District Environmental Management Framework, 2015.
- Transnet Capital Projects: Berth 203 to 205 Expansion Integrated Waste Management Approach, 2015.
- Department of Water and Sanitation: Climate Change Specialist Study for Foxwood Dam EIA, 2015.

- Transnet Capital Projects: Climate Change Adaptation Monitoring and Evaluation Plan for Berth 203 to 205 Expansion, 2015.
- Department of Water and Sanitation: Boskop Dam Resource Management Plan and Business Plan, 2013.
- Department of Water and Sanitation: Midmar Dam Resource Management Plan and Business Plan, 2013.
- Department of Water and Sanitation: Craigieburn Dam Resource Management Plan and Business Plan, 2013.
- Department of Water and Sanitation: Theewaterskloof Dam Resource Management Plan and Business Plan, 2013.
- Department of Water and Sanitation: Vanderkloof Dam Resource Management Plan and Business Plan, 2013.
- Department of Water and Sanitation: Vygeboom Dam Resource Management Plan and Business Plan, 2014.
- Department of Water and Sanitation: Pongolapoort Dam Resource Management Plan and Business Plan, 2014.
- Department of Water and Sanitation: Inanda Dam Resource Management Plan and Business Plan, 2015.
- Department of Water and Sanitation: Hazelmere Dam Resource Management Plan and Business Plan, 2015.
- Department of Water and Sanitation: Grootdraai Dam Resource Management Plan and Business Plan, 2014.
- Department of Water and Sanitation: Gariep Dam Resource Management Plan and Business Plan, 2014.
- Department of Water and Sanitation: Voelvlei Dam Resource Management Plan and Business Plan, 2014.
- Department of Water and Sanitation: Wriggleswade Dam Resource Management Plan and Business Plan, 2014.
- Department of Water and Sanitation: Vaal Dam Resource Management Plan and Business Plan, 2014.
- Department of Water and Sanitation: Mthatha Dam Resource Management Plan and Business Plan, 2015.
- Department of Water and Sanitation: Allemenskraal Dam Resource Management Plan and Business Plan, 2015.
- Department of Water and Sanitation: Greater Brandvlei Dam Resource Management Plan and Business Plan, 2015.
- Department of Environmental Affairs: Mapungubwe Culture Landscape Environmental Management Framework, 2014.
- Nkomati Anthracite Mine: Social Impact Assessment for the Nkomati Anthracite Mine, Mpumalanga, 2011.

Professional Affiliations

- Professional Member of Southern African Institute of Ecologists and Environmental Scientists: 2015 - 2016.
- SACNASP– Pr. Sci. Nat.(116221): 2016



herewith certifies that

Vanessa Jean Stippel

Registration number: 116221

is registered as a

Professional Natural Scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)

in the following field(s) of practice (Schedule 1 of the Act)

Environmental Science

Effective **21 September 2016**

Expires **31 March 2017**



A handwritten signature in black ink, appearing to read 'Botha', written over a horizontal line.

President

A handwritten signature in black ink, appearing to read 'M. J. ...', written over a horizontal line.

Executive Director

Curriculum vitae: Mr D Botha

Name : **BOTHA, DE WET**
Date of Birth : 20 June 1977
Profession/Specialisation : Principle Environmental Scientist & Wetland Specialist
Nationality : South African
Years' experience : 13

Key Experience

Mr Botha has extensive experience in conducting a broad range of applications related to authorisation from the various authorities managing Environmental Legislation in South Africa. Mr Botha has completed numerous EIA's and Basic Assessment Report applications. He has conducted EIA reviews and has acted in a specialist advisory role to other consultants/applicants. Management plans compiled include Environmental Management Plans, Open Space EMPs, Wetland EMP's and Waste Management Plans.

The practitioner has extensive and specialised experience in wetland and aquatic assessment and delineation, as well as applications for Water Use Licenses.

Additional to this, Mr Botha also has experience in Visual Assessments, Specialist Faunal and Floral Surveys, Grassland Rehabilitation and Baseline Agricultural Potential Studies. Mr Botha is an experienced Environmental Control Officer and –Auditor. GIS data and spatial modelling is included in Mr Botha's range of capabilities, along with GIS sensitivity mapping and Project Management.

As a specialist interest, Mr Botha has been involved with research and studying the habitat area of the Juliana's Golden Mole, a Red List threatened species, in association with the Pretoria of University (Dr Sarita Maree).

Education & Key qualifications

MAGISTER ARTIUM (M.A. Environmental Management)

University of Johannesburg (2005-2006)

- Thesis: *Establishing Guidelines for Environmental Management Plans for Golf Course Developments in Gauteng Province.*
- Syndicate research: *Baseline Environmental Assessment investigating the flow of Mercury through the system at the University of Johannesburg in Mercury containing Lighting as a by-product.*
- The biosphere & environmental studies.
- Environmental analysis, management skills & perspectives.

DIPLOMA: REMOTE SENSING AND IMAGE PROCESSING

Rand Afrikaans University (2001)

DIPLOMA: GEOGRAPHIC INFORMATION SYSTEMS (GIS)

Rand Afrikaans University (2001)

BACHELOR OF ARTS (HONOURS) (BA. (Hons) Geography and Environmental Management)

Rand Afrikaans University (2001)

Modules completed:

- Geomorphology
- Energy Technology
- Remote Sensing and Satellite Imagery
- Geographic Information Systems
- Philosophy and Methodology of Geography

POST GRADUATE HIGHER EDUCATIONAL DIPLOMA (PHED).

Rand Afrikaans University (1999-2000)

BACHELOR OF ARTS (BA. Geography and Environmental Management)

Rand Afrikaans University (1996-2000)

Supplementary Qualifications

- Financial Provision Regulations and Mine Closure Requirements (2016) IMBEWU Sustainability Legal Specialists.
- SASS5 Aquatic Biomonitoring Training Course (DWA, Ground Truth) (2014)
- Tools for Wetland Assessments (Rhodes University) (2011) (Cum Laude) - Certified
- Short Course in Soil Classification and Wetland Delineation (Terra Soil Science) (2008)
- Wetland and Riparian Delineation Course (DWAF Accredited) (2008)
- Practical Field Training – Golden Mole Field Surveys (2007) (Dr. S. Maree)
- Lead auditors course (Environmental) ISO 14000 (University of Johannesburg) (2006)
- Geographical Information Systems (GIS) (Run by Geographical Information Management Systems (GIMS) - Introduction to Arcview GIS (2000)
- Geographical Information Systems (GIS) (Run by Geographical Information Management Systems (GIMS) – Introduction and Advance ArcInfo (2000)
- Geographical Information Systems (GIS) Introduction to MapInfo (2000)
- Geographical Information Systems (GIS) Advance and Specialist Map-Info (2000)

Employment record

August 2005 – Present	Prism EMS, Managing Director, Principle EAP, Wetland Specialist
August 2007 – Present	Greenline Environmental, Director, Principle EAP & Wetland Specialist
April 2004 – July 2005	Holgate and Associates, Environmental Scientist
January 2003 – February 2004	North Westminster Community College (UK), HOD Humanities Dept.
January 2002 – December 2002	Kelmscott Secondary School, (UK), HOD Geography
January 2001 – December 2001	Hoërskool Vryburger, Germiston, Teacher (Geography)
August 1999 – December 2000	The Knowledge Factory (Primedia), GIS Specialist/Product Owner

Experience record (Key Projects)

Relevant Project Experience (more detail available on request)

Air Quality Projects:

- BP Wiggill – Smelter, 2016;
- Northam Platinum, North West, 2015;
- Maroeloesfontein Andalusite Mine, North West, 2015;
- Eco-Planet Bamboo Core Carbon, Grahamstown, Eastern Cape, 2014;

Aquatic Assessments:

- Sunninghill Ext 168, 2016;
- Happy Island Water Park, 2016;
- Eskom, Rustenburg, North West Province, 2015;
- Steyn City, Johannesburg, Gauteng, 2015;
- Nederburg, Paarl, Western Cape, 2014;

- The Reeds, Johannesburg, Gauteng, 2014;
- Elias Motsoaledi, Soweto, Gauteng, 2014;
- K6 – Provincial Road, Pretoria, Gauteng, 2013;

Wetland Assessments:

- Greengate Ext 68, 2016;
- Happy Island Water Park, 2016;
- Wilgeheuwel Ext 60, 2016;
- Rose interchange, Gautrans, 2015;
- Eskom, Rustenburg, North West Province, 2015;
- Mogalakwena Platinum Mine, Limpopo Province, 2015;
- Steyn City, Johannesburg, Gauteng, 2014;
- Nederburg, Paarl, Western Cape, 2014;
- Elias Motsoaledi, Soweto, Gauteng, 2014;

Recent Water Use License Applications completed, include:

- Witpoortjie Ext. 52 & 57 Township Development – to facilitate the installation of essential services to the township.
- Winterveld – Installation of bulk sewer lines
- Vista Park Ext.3 - mixed-use township development and related bulk services
- Steyn City - mixed-use township development and related bulk services
- Joburg Water - Installation of bulk sewer lines
- Rooiwaal – Tswane - Installation of bulk sewer lines
- Soshanguve South Ext. 6 – Bridge crossing
- Elias Motsoaledi – Bridge crossing

Professional affiliations

- Founder Member of Environmental Assessment Practitioners Association of South Africa (EAPASA)
- Member of the International Association for Impact Assessors (IAIAsa)
- Member of the Gauteng Wetland Forum
- Member of the South African Wetland Society

Curriculum Vitae: Ms C Lubbe

Name : **LUBBE, CANDIS**
Date of Birth : 3 October 1983
Profession/Specialisation : Senior Environmental Assessment Practitioner
Nationality : South African
Years' experience : 10

Key Experience

Candis Lubbe has ten (10) years' working experience as an environmental consultant in the general industry and mining sectors. Key experience includes the overall project lifecycle management of environmental authorisation applications such as basic assessments, Environmental Impact Assessments (EIAs), Waste Licences, Water Use Licence Applications, and Rectification of unlawful activities (Section 24G Applications) including the associated public participation processes. Additional experience comprises the compilation of mining and prospecting applications, environmental management programmes and plans, financial provision calculations and providing continuous environmental and legal guidance to existing mining operations of various minerals (silica, aggregate, gold, chrome, pyrophyllite and tailings reclamation).

Ms. Lubbe also has experience related to the assessment of complex sites, operations and facilities including general environmental management, legal compliance assessments, due diligence, assessment of potential land contamination, environmental performance audits (MPRDA), and auditing of Environmental Authorisations (WUL and NEMA).

Key Qualifications

BSC HONOURS (ECOLOGY, ENVIRONMENT AND CONSERVATION)

University of the Witwatersrand (2006)

BACHELOR OF SCIENCE (ZOOLOGY)

University of the Witwatersrand (2005)

Supplementary Training

-) **General water Use Authorisations (2017)**
IMBEWU Sustainability Legal Specialists
-) **Financial Provision Regulations and Mine Closure Requirements (2016)**
IMBEWU Sustainability Legal Specialists.
-) **SA Waste Laws Update Workshop (2015)**
Laura Taylor, EnviroSus.
-) **Basic Principles of Ecological Rehabilitation and Mine Closure (2014)**
CEM, North-West University Potchefstroom Campus.
-) **Contaminated Land Workshop (2013)**
IMBEWU Sustainability Legal Specialists.
-) **Technical & Legal Guidelines for EIAs (2011)**
DLA Cliffe Dekker Hofmeyer.
-) **Introduction to Integrated Waste Management for Environmental Managers (2011)**
CEM, North-West University Potchefstroom Campus.
-) **Cross Cutting & Integrated EIA Training (2011)**
IMBEWU Sustainability Legal Specialists.
-) **Public Participation (2009)**
CEM, University of the Free State.

- J **Project Management for Environmental Impact Assessments (2009)**
CEM, University of the Free State.
- J **Social Impact Assessment(2009).**
CEM, University of the Free State.
- J **Environmental Awareness & Legal Liability for Managers (2008).**
Green Gain Consulting.
- J **Monitoring of Ecological Success Criteria for Mine Site Closure.**
David Tongway, University of Western Australia (held in SA).
- J **Environmental Law for Environmental Managers(2007).**
CEM, North-West University Potchefstroom Campus.

Employment Record

Nov 2015 – To date	PRISM Environmental Management Services Senior Environmental Assessment Practitioner
Aug 2010 – Oct 2015	Umlaba Environmental Consulting CC Environmental Consultant
Jan 2007 – Sep 2007	EcoPartners (Pty) Ltd Junior Environmental Consultant
Oct 2007 – Jun 2009	EnviroServ Waste Management (Pty) Ltd National Junior Project Co-ordinator
Jul 2009 – Jul 2010	EcoPartners (Pty) Ltd Environmental Scientist

Project Experience

Environmental Authorisation Process (BA, EIA, WL, WULA):

- J Happy Island: EIA and WULA for development of a Water Park, 2016
- J Macsteel Tube & Pipe: Lillianton: Basic Assessment for Decommissioning of Galvanising Plant, 2016.
- J Sand Shifters: Nietgedacht EIA, Waste Licence and WULA for storage, handling and distribution of building waste, 2016.
- J Northam Platinum Limited: Basic Assessment for AEL Amendment for Smelter Expansion, 2016.
- J Goedeberg: WULA for Bulk Sewer Line Installation, 2016.
- J Gold One: Modder East: EIA and Waste Licence, 2015.
- J HALO Aviation: Basic Assessment for Heliport, 2012.
- J AfriSam: Jukskei: Basic Assessment for Construction of Infrastructure within a Watercourse, 2011.
- J Gold Fields: Public Participation Process and Socio-Economic Study for EIA, 2009.
- J Gold Fields: EIA for Mega Tailings Storage Facility (team project), 2009.
- J Savcio Holdings: LH Marthinusen: Basic Assessment Process, 2009.
- J Modikwa Platinum: Basic Assessment (not completed), 2009.
- J Savcio Holdings: LH Marthinusen: Basic Assessment for treatment of used oil, 2008.
- J Spray Pave: Basic Assessment for storage for dangerous goods (not completed), 2008.
- J Oil Separation Solutions: Waste Permit: Assisted with compilation of Section 20 of ECA, 2007.
- J Old Oil Man: Waste Permit: Assisted with compilation Section 20 of ECA, 2007.

Section 24G Applications:

- J Assore: Rustenburg Mineral Development Company: Groenfontein: Section 24G Application, 2014.
- J Assore: Rustenburg Mineral Development Company: Zandspruit: Section 24G Application, 2014.
- J Assore: Wonderstone Limited: Section 24G Application, 2014.
- J Assore: Zeerust Chrome Mines Limited: Section 24G Application, 2014.
- J Rubble Tech: London Road: Section 24G Application, 2013.
- J JPL Sawmills: Section 24G Application, 2011.
- J Spray Pave: Section 24G Application, 2008.

Mining/Prospecting Applications, EMPLans and Amendments:

-) Jukskei Sand Project CC: Section 106 Notification, 2011.
-) Mining Permit / Prospecting Right Applications:
 - o Benoni South: Prospecting Right Application & Basic Assessment, 2016.
 - o Bundu Sand: Mining Permit Application and EMPlan, 2014.
 - o Heidelberg Clay & Brick Sand: Mining Permit Application, 2014.
 - o Infrasons: Marble Hall: Mining Right Application (not completed), 2013.
 - o BSC Resources: KZN5: EMPlan Amendment, 2012.
 - o Gold One: Ventersburg 6: EMPlan & Amendment, 2012.
 - o Jukskei Sand Project CC: Mining Permit Application, 2012.
 - o Uitzicht Sands: EMPlan, 2011.
 - o Whitewater Westward Exploration: EMPlans for C1, C2A and C3, 2010.
 - o Goliath Gold Mining Limited: Blinkpoort: EMPlan Amendment, 2012.
-) Financial Provisions:
 - o Janho Quarry: Financial Provisions, 2016.
 - o Goliath Gold Mining Limited: Nigel: Financial Provision, 2011.
 - o Goliath: Sub-Nigel: Financial Provision, 2012.
 - o Group Five: Laezonia: Financial Provision, 2012.
 - o Raumix: Rosslyn: Financial Provision, 2012.
 - o Renewals:
 - o AfriSam: Saldanah: Prospecting Right Renewal, 2011.
 - o BSC Resources: Prospecting Right Renewal Environmental Report, 2011.
 - o Gold One: Wit Nigel: Right Renewal: Environmental Report, 2011.
 - o Uitzicht Sand: Mining Permit Renewal, 2014.
 - o Gold One: Ventersburg 3&4: Prospecting Right Renewal, 2013.
-) Closure Applications:
 - o Group Five: Panfontein: Closure Application (PR), 2013.
 - o Tradmil Trading 10 (Pty): Vischgat: Closure Application MP & PR, 2013.

EIA/EMP Amendments (Section 102 MPRDA):

-) Drift Supersand: EMP Amendment, 2015.
-) Group Five: Zimbiwa Resources: EMP Amendment, 2012.
-) AfriSam: Zeekoewater: EMP Amendment, 2011.
-) Gold One Limited: Ventersburg: Natural Gas Exploration EMP Amendment, 2011.
-) Raumix: Aliwal: EMP Amendment (assist), 2011.
-) Raumix: Queenstown: EMP Amendment (assist), 2011.
-) Gold One Limited: Ventersburg: Natural Gas Exploration EMP, 2010.
-) Gold Fields: Driefontein: EMP Amendment, 2010.

Environmental Performance Assessment Audits (Regulation 55 MPRDA):

-) Janho Quarry: Environmental Performance Audit (MR), 2016.
-) AfriSam: Rheeboek: Environmental Performance Audit (MR), 2015.
-) Bundu Mining: Environmental Performance Audit (MR), 2015.
-) Drift Supersand: Environmental Performance Audit (MR), 2015.
-) PPC: Dwaalboom: Environmental Performance Audit (MR), 2015.
-) Raumix: Willows: Environmental Performance Audit (MR), 2015.
-) Group Five: Sky Sands: Environmental Performance Audit (MP), 2014.
-) AfriSam: Eikenhof: Environmental Performance Audit (MR), 2013.
-) AfriSam: Olifantsfontein: Environmental Performance Audit (MR), 2013.
-) PPC: Dwaalboom: Environmental Performance Audit (MR), 2013.
-) Raumix: Rossway: Environmental Performance Audit (MR), 2013.
-) AfriSam: Roodekrans: Environmental Performance Audit (MR), 2012.
-) AfriSam: Ulco Cement: Environmental Performance Audit (MR), 2012.
-) Goliath: New Kleinfontein - Modder East: Environmental Performance Audit (MR), 2012.
-) Goliath: Sub-Nigel: Environmental Performance Audit (MR) & Financial Provision, 2012.
-) Gomes Sands: Bundu Sands: Environmental Performance Audit (MP), 2012.
-) Gomes Sands: Doornrandjie: Environmental Performance Audit (MP), 2012.

-) Group Five: Laezonia: Environmental Performance Audit (MP) & Financial Provision, 2012.
-) New Kleinfontein: Modder East: Environmental Performance Audit (MR), 2012.
-) Raumix: Petra Quarry: Environmental Performance Audit (MR), 2012.
-) AfriSam: Rooikraal: Environmental Performance Audit (MR), 2011.
-) Group Five: Sky Quarries (Tradmil Trading): Environmental Performance Audit (MP), 2011.
-) Raumix: Rosslyn: Environmental Performance Audit (MR), 2011.
-) AfriSam: Jukskei: Environmental Performance Audit (MR), 2010.
-) Gold One Limited: Sub-Nigel: Environmental Performance Audit (MR), 2010.

Audits (Legal, RoD Compliance / Internal):

-) Gold One: Modder East: Water Use Licence Audit, 2015.
-) PPC: Dwaalboom: Environmental Audit (RoD), 2015.
-) Assore: Environmental Component of the EHS Legal Compliance Audit, 2014.
-) Dawn Sanitaryware: Legal Compliance Report for Vaal Sanitaryware and Libra Bathrooms, 2010.
-) Vaal Sanitaryware: Site Assessment – Manufacturing Process & Waste Streams, 2010.
-) Gold One Limited: Modder East: Internal Audit, 2010.
-) Basil Read: Legal compliance audit (team project), 2008.
-) Oil Separation Solutions: Legal compliance audit (team project), 2008.
-) NORA-SA: Audit reports for used oil collectors, 2007.
-) Oil Separation Solutions: Evaluation of Minimum Requirements of ROD Waste Permit, 2007.

Other:

-) Assore: Wonderstone Limited: Waste Classification.
-) JPL Sawmills: Directive, 2014.
-) Group Five: Laezonia: Due Diligence, 2013.
-) PPC: Best Practice Procedure: Waste Management & I&AP Consultation, 2013.
-) AfriMat: Inferon: Due Diligence, 2012.
-) Gold One: Ventersburg: BFS Specialist Studies Review (Socio-Economic, Noise and Traffic).
-) Pronto: Ulula Ash: Environmental Management Plan, 2012.
-) Eskom: Matimba: Review of SHEQ Impact Register (project team), 2010.
-) Eskom: Matimba: Training Material: Environmental Awareness and Legal Compliance, 2010.
-) EnviroServ: Training Material: Legal Compliance & Environmental Awareness, 2009.
-) Basil Read: SHEQ Legal Register, 2008.
-) NORA-SA: Operations Manual for Used Oil Collectors, 2007.
-) Basil Read: Operations and Maintenance Manual for Modimolle Water Tower, 2007.
-) Oil Separation Solutions: Operational Procedures: Integrated Management System ISO 14001, ISO 9001 and HSAS 18001, 2007.
-) Oil Separation Solutions: SHEQ Legal Register, 2007.

Professional Affiliations

-) South African Council for Natural Scientific Professions (SACNASP) Registration No: 116831: 2017
-) Environmental Law Association (ELA): 2015-2016.
-) International Association Impact Assessment (IAIA): 2011-2013.



herewith certifies that

Candis Lubbe

Registration number: 116831

is registered as a

Professional Natural Scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)

in the following field(s) of practice (Schedule 1 of the Act)

Environmental Science

Effective 25 January 2017

Expires 31 March 2017



A handwritten signature in black ink, appearing to read 'Botha', positioned above a horizontal line.

President

A handwritten signature in black ink, positioned above a horizontal line.

Executive Director

12.2. Outline Scheme Report

Refer to Appendix I of the Draft Basic Assessment

12.3. Toolbox Talks

ENVIRONMENTAL TOOLBOX TALK

WASTE

- Waste must be disposed in the provided waste bins.
- No litter is allowed on site.
- Do not mix hazardous waste and general waste
- Types of hazardous waste: contaminated soil, oil rags, empty paint tins, used cement bags, used spill sorb etc.
- Throw all food packaging in general waste bins
- Recyclable waste (glass, plastic and paper) to be disposed in appropriate bins.
- Cigarette's buds to be thrown in buckets provided.
- Use toilets provided all the time.
- Full waste bins to be disposed into the waste skips provided.
- All waste that can cause harm to animals like steel straps, conductor off-cuts, re-bar, wire off-cuts must be removed from site daily.
- No burning of waste allowed.
- Medical waste (from first aid kit) to be put in the plastic and taken to the local clinic/hospital.

DATE:.....

NAME	SIGNATURE	NAME	SIGNATURE

SAFETY REP SIGNATURE:

ENVIRONMENTAL TOOLBOX TALK

Water management

- Ensure that you have enough drinking water on site.
- Do not drink water from any other source either than water collected from the site camp.

DATE:.....

NAME	SIGNATURE	NAME	SIGNATURE

SAFETY REP SIGNATURE:

ENVIRONMENTAL TOOLBOX TALK

Plants

- We must ensure that we minimise impact of vegetation outside of the construction site area.
- No removal and collection of plants unless authorised.
- No removal of large trees unless it is absolutely necessary.
- No disturbance to plants and trees marked as protected unless you are authorised.
- Protected plants will be marked or fenced off if required.
- Indigenous plants found in the working area must be relocated.
- Vegetation clearing must take place with an authorisation.
- Removal and pruning of trees that might damage the powerline will be done in consultation with Eskom and the landowner.
- No collection of wood is allowed.

DATE:.....

NAME	SIGNATURE	NAME	SIGNATURE

SAFETY REP SIGNATURE:

ENVIRONMENTAL TOOLBOX TALK

Animals

- No killing or hunting of animals on site.
- Road kill to be noted in the incident register
- Small road kill to be left on site for scavengers, large bodies to taken off site as waste.
- Open excavations to be demarcated with orange netting.
- Gates to be closed at all times to protect livestock and game.
- Obey speed limit on site to avoid animal fatalities.
- Do not leave food packaging and containers (plastics) on site that can be consumed by animals.
- Construction material that can cause harm to animals to be removed from site.
- Do not feed wildlife
- In an event of a snake or a problem animal is found on site a trained person must be called in to remove the animal from site.
- Report breeding nests found on site to the construction manager.
- Rock outcrops can be a habitat for certain animals, care to be taken when working around them.

DATE:.....

NAME	SIGNATURE	NAME	SIGNATURE

SAFETY REP SIGNATURE:

ENVIRONMENTAL TOOLBOX TALK

How to clean a spill

- Drip trays must be placed underneath the leak to prevent further spillage.
- Drip trays must be used when refuelling plant on site.
- All teams must have spill kits with them available on site.
- The source of the leak must be closed off, if not it must be taken off site for repairs.
- Contaminated soil shall be dug out and placed into the provided plastic bags.
- After the soil has been removed, absorbent material and sawdust must be used to complete the cleaning of the spill.
- All contaminated soil and clean-up material will be disposed into hazardous waste skip provided.

DATE:.....

NAME	SIGNATURE	NAME	SIGNATURE

SAFETY REP SIGNATURE: