



ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

FOR

THE FORMALISATION OF WARBURTON INFORMAL SETTLEMENTS AND TOWNSHIP DEVELOPMENT ON PORTION 15 OF THE FARM FERNIGEHAUGH 70 IT, WITHIN MSUKALIGWA LOCAL MUNICIPALITY UNDER GERT SIBANDE DISTRICT IN THE MPUMALANGA PROVINCE.

PREPARED FOR:

Mahlori development Consultants

Contact person: Morgan Mutapanduwa

Cell: 012 943 0068

Physical address: 94 Pony Street Suite 11 and 12, Tiger Vallei, Silver Lakes, Pretoria

Email: m.mutapanduwa@mahlori.co.za



PREPARED BY:

Global Geo Enviro Specialists

Contact Person: Mulweli Makatu

Contact details: 072 1190 434

Email: mulwelimakatu@globalgeo.co.za

Physical address: 21 Coral Drive Mooikloof Heights Estate, Pretoria East 0059



ON BEHALF OF:

Msukaligwa Local Municipality

Contact person: Craig Mathebula

Cell: 083 479 6477

Tel: 017 801 3500

Postal address: P.O. Box 48 Ermelo 2350

Email: fcmathebula@msukaligwa.gov.za



Contents

INTRODUCTION.....	6
1.1 Objectives of the EMPr.....	6
2. SITE DESCRIPTION AND LOCATION OF THE PROJECT.....	7
2.1 Location.....	7
3. DESCRIPTION OF RECEIVING ENVIRONMENT.....	8
3.1 Climate.....	8
3.2 Vegetation.....	9
4. LEGAL REQUIREMENTS.....	11
4.6 National Heritage Resources Act, 1999 (Act No. 25 of 1999).....	12
4.7 National Environmental Management Act: Biodiversity Act (Act No. 10 of 2004).....	12
5. PHASES OF THE PROJECT.....	15
5.1 Planning And Design Phase/ Pre-Construction Phase.....	15
5.2 Construction Phase.....	15
5.3 Operational Phase.....	15
6. ENVIRONMENTAL MITIGATION AND MANAGEMENT MEASURES.....	17
7. MANAGEMENT AND MONITORING PROCEDURES.....	42
7.1 Specific Roles and Responsibilities.....	42
7.1.1 Applicant.....	42
7.1.2 The Contractor.....	42
7.1.3 Project Manager.....	43
7.1.4 The Environmental Control Officer (ECO).....	43
7.1.8 The Local/Provincial Environmental Authority.....	44
8. REHABILITATION.....	44
9. GENERAL CONDUCT.....	45
10. ENVIRONMENTAL AWARENESS PLAN.....	45
11. CONCLUSION.....	46
12. REFERENCES.....	46
ANNEXURE A.....	47

DETAILS OF THE EAP WHO PREPARED THE REPORT;

EAP name: Mulweli Makatu

Professional affiliation: EAPASA 2021/3432

Ms Mulweli Makatu she is a registered Environmental Assessment Practitioner, she holds a degree in Bachelor of Environmental Sciences from the University of Venda, Bachelor of Environmental Sciences Honours Degree from the University of Venda. She is currently appointed by Global Geo Enviro Specialists as an Environmental Assessment Practitioner. She has been involved in several activities that includes most facets of environmental Management.

EAP EXPERTISE

Ms Mulweli Makatu has conducted several EIA for various developments in the Limpopo and Gauteng Province, our professional team has been involved in the following environmental authorisation processes:

The Proposed Sports Arena development -Limpopo

The Proposed Cash Crop Farming- Limpopo

The Proposed Chicken farming- Gauteng

The Proposed Maubane Township Development- Northwest

The proposed Kawayeni Township development-Limpopo

The Proposed Madombidzha filling station and shopping centre- Limpopo

The proposed Cash Crop Farming- Limpopo

The Rectification of Riverside Informal Settlement- Free State

Section 24G Application for Everland Chicken Farming- Limpopo

REQUIREMENTS OF AN ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT IN TERMS OF GN R. 326 APPENDIX 4

(1) An EMPr must comply with Section 24N of the Act and include –

(a) Details of –

(i) The EAP who prepared the EMPr; and

(ii) The expertise of the EAP to prepare an EMPr, including a curriculum vitae;

(b) A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;

(c) A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;

(d) A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including – (i) Planning and design;

(ii) Pre-construction activities;

(iii) Construction activities;

(iv) Rehabilitation of the environment after construction and where applicable post closure; and

(v) Where relevant, operation activities;

(f) A description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph

(d) will be achieved, and must, where applicable include actions to –

(i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;

(ii) Comply with any prescribed environmental management standards or practices;

- (iii) Comply with any applicable provisions of the Act regarding closure, where applicable;
 - (iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;
 - (g) The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);
 - (h) The frequency of monitoring the implementation of the impact management actions contemplated in (f);
 - (i) An indication of the persons who will be responsible for the implementation of the impact management actions;
 - (j) The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;
 - (k) The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);
 - (l) A program for reporting on compliance, taking into account the requirement as prescribed by the regulations;
 - (m) An environmental awareness plan describing the manner in which –
 - (i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and
 - (ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment; and
 - (n) Any specific information that may be required by the competent authority.
- (2) Where a government notice gazetted by the Minister provides for a generic EMP, such generic EMP as indicated in such notice will apply. Environmental Management

1. INTRODUCTION

Global Geo Enviro Specialists (Pty) Ltd was appointed by Mahlori Development Consultants on behalf of Msukaligwa Local Municipality as an independent Environmental Assessment Practitioner (EAP) to compile the Environmental Management Programme report for the formalisation of Warburton Informal settlement and township development on portion 15 of the Farm Fernigehaugh 70 IT, within the Msukaligwa Local Municipality of Gert Sibande District in the Mpumalanga Province.

Environmental Management programme report (EMPr) refers to a programme that seeks to achieve a required end state and describes how activities that have or could have an adverse impact on the environment, will be mitigated, controlled, and monitored. The EMP will address the environmental impacts during the design, construction and operational phases of a project. Due regard must be given to environmental protection during the entire project. In order to achieve this number of environmental specifications/recommendations are made. These are aimed at ensuring that the contractor maintains adequate control over the project in order to:

- Minimise the extent of impact during construction.
- Ensure appropriate restoration/rehabilitation of areas affected by construction, as close as possible to the original contours.
- Prevent long term environmental degradation.
- The contractor must be made aware of the environmental obligations that are stipulated in this document and declares him/her to be conversant of all relevant environmental legislation.

1.1 Objectives of the EMPr

- Identifying those construction activities that might have a detrimental impact on the environment;
- Detailing the mitigation measures that will need to be taken, and the procedures for their implementation;
- Establishing the reporting system to be undertaken during the construction.
- The EMPr also serves to highlight specific requirements that will be monitored during the development, and should the environmental impacts not have been satisfactory prevented or mitigated, corrective action will have to be taken.

The document should, therefore, be seen as a guideline that will assist in minimising the potential environmental impact of activities. Mitigation measures can be defined as a tool that seeks to find better ways of doing things, by the implementation of practical measures to reduce, limit, and eliminate adverse impacts or enhance project benefits and protect public and individual rights.

The EMPr also defines the arrangements that will be put in place to ensure that the mitigation measures are implemented by including recommendations of the roles and responsibilities of the project proponent, environmental management team and contractors.

2. THE STATUS OF THIS DOCUMENT

The Provision of this EMPr is binding on the contractor during the construction phase and defects liability period of the contract. These specifications shall be read in conjunction with all the documents that comprise the contract documents for this contract. If any conflict occurs between the terms of the construction EMPr and the Project Specification or the EA, the terms of the construction EMPr shall stand.

The potential negative environmental impacts that may be triggered by the above activities include environmental pollution, deformation of the landscape, soil / sand erosion and visual disturbance. In order to minimize these impacts, care must be taken with, inter alia, the disposal of waste, spillage, storage, noise and dust control, preservation and re-establishment of indigenous vegetation and sediment management and the demarcation of sensitive areas. Minimal negative environmental impacts must occur during the maintenance phase of the proposed project.

2. SITE DESCRIPTION AND LOCATION OF THE PROJECT

2.1 Location

The project is located remainder of portion 15 of the Farm Fernihaugh 70 IT, within the Msukaligwa Local Municipality of Gert Sibande District in the Mpumalanga Province. The proposed township establishment is located at Warburton which is approximately ±65 km East of Ermelo along the N17 road to Swaziland, is located approximately 42km northwest of Carolina.

Table 1: Description of the property

MUNICIPALITY	FARM NAME	COORDINATES		DEVELOPMENT FOOTPRINT (ha)
Msukaligwa Local Municipality under Gert Sibande District	Fernihaugh 70 IT	Latitude:	26°13'51.16"S	42 Ha
		Longitude:	30°29'7.42"E	
21-digit SG code	T 0 I T 0	0 0 0 0 0	0 0 0 0 7 0 0	0 0 1 5

2.2 Access to the site:

The development is located at Warburton township which is approximately ±65 km East of Ermelo along the N17 road to Swaziland.

2.3 Current land uses

The proposed site is a vacant land and informal settlement on the Northern part and Eastern part of the proposed development site.

LOCALITY MAP FOR THE FORMALISATION OF WARBURTON INFORMAL SETTLEMENT AND TOWNSHIP DEVELOPMENT

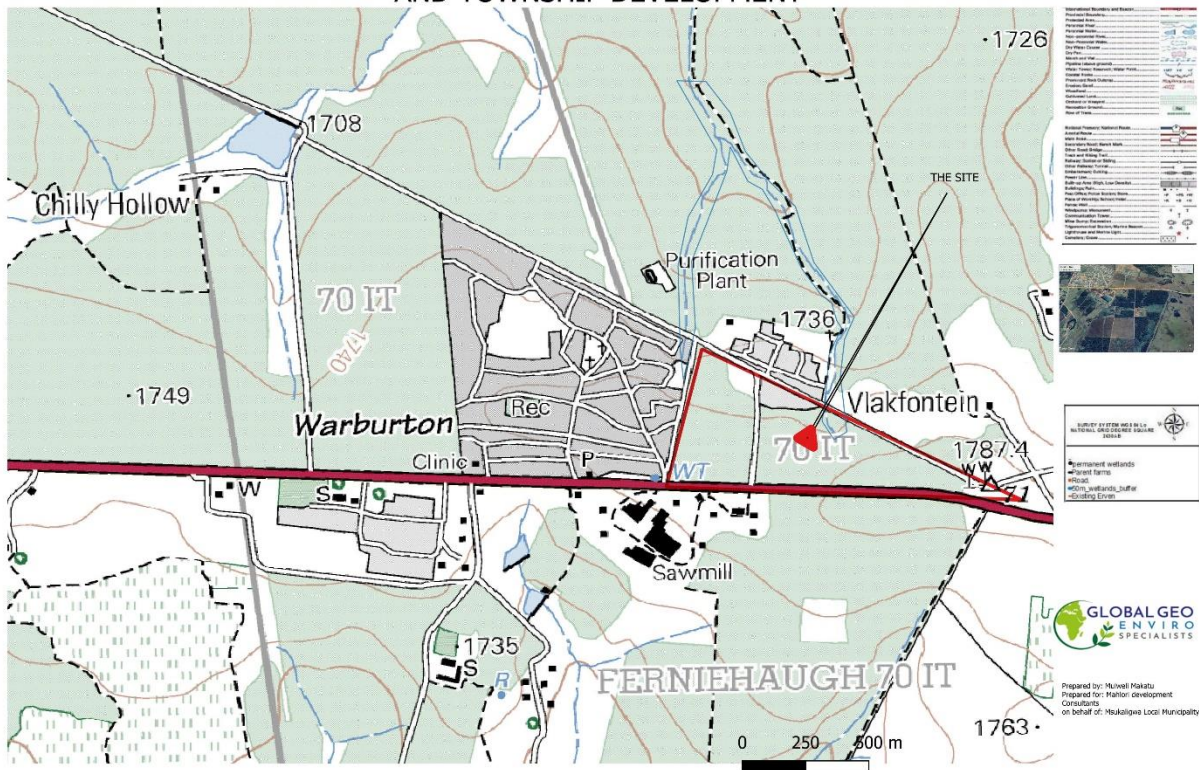


Figure 1: Locality Map

3. DESCRIPTION OF RECEIVING ENVIRONMENT

3.1 Climate

Msukaligwa Local Municipality falls under the central Mpumalanga climatic zone characterized by warm, rainy summers and dry winters with sharp frosts. Rainstorms are often violent (up to 80mm per day) with severe lightning and strong winds, sometimes accompanied by hail. The winter months are droughty with the combined rainfall in June, July and August making up only 3,9% of the annual total (734mm). The average daily maximum temperature in January (the hottest month) is 25,2°C and in July (the coldest month) is 16,7°C. Due to its position near the escarpment, the area is somewhat windier than is typical for the South - Eastern Mpumalanga Highveld, although the majority of winds are still light and their direction is controlled by topography (Msukaligwa LM Spatial Development Framework, 2010).

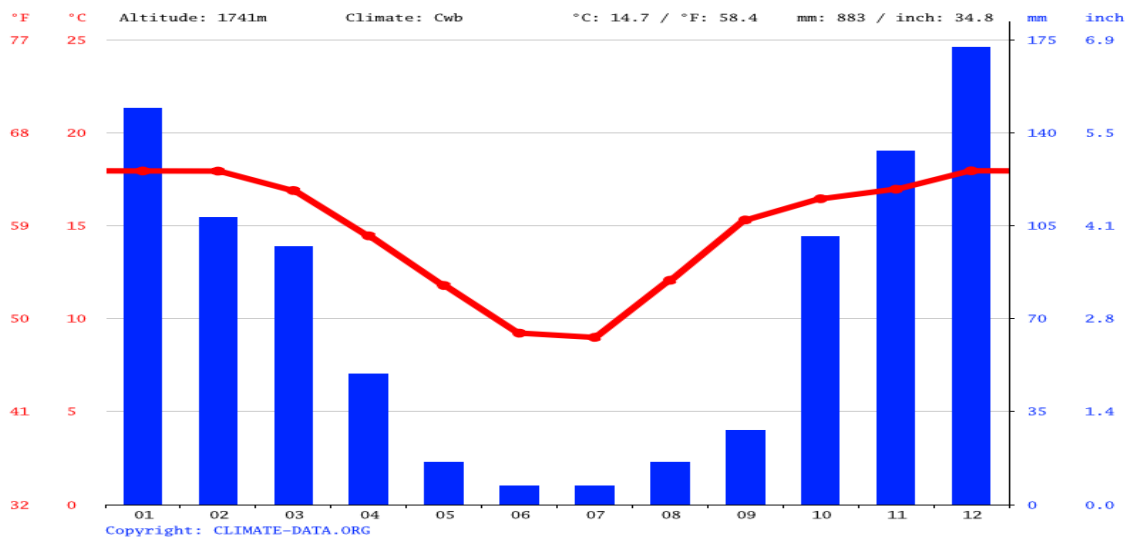


Figure 2: climatic factor of the area

3.2 Vegetation

Mucina and Rutherford (2006) classified the study area to be in the Highveld Grassland vegetation type. The vegetation type is found in Mpumalanga, Existing vegetation in the undeveloped areas of Msukaligwa Local Municipality consists predominantly of typical Highveld grasslands. Within the proposed site herbaceous plants and invasive weeds are the ones appearing at stature of young seedlings and only few trees to the range of 1-1,5m height. Invasive plant species are the ones that dominate the area as confirmed during surveys throughout the study area. Wattle trees plantation exist in the surrounding vicinity of the area.

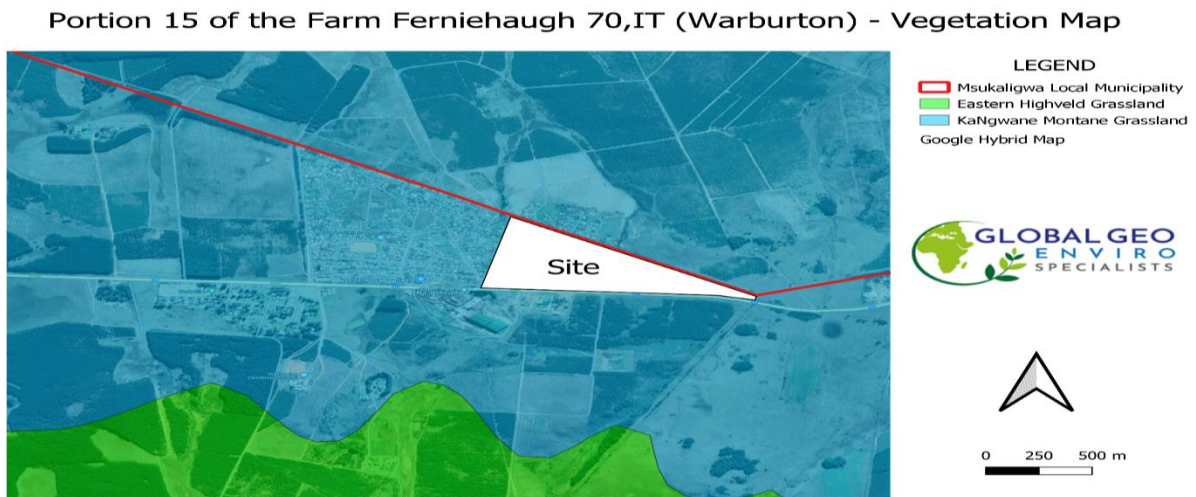


Figure 3: Vegetation type of the area



Figure 4: Vegetation cover of the area

3.3 Topography

Msukaligwa LM is characterized by the gently undulating highland topography with fairly broad to narrowly incised valleys of headwater drainages. The rural areas are also characterized by typical Highveld landscapes in the western and central parts, and more undulating terrain with dense commercial forests in the eastern parts. Interesting landscapes are found in the Chrissiesmeer panveld area.

3.4 Hydrology

There are a number of marshy areas or vleis in the upper parts of the valleys and numerous pans, which vary from insignificant vegetated depressions to large deeply etched features with bare clayey floors. An ecologically important concentration of pans and freshwater lakes is located in the Chrissiesmeer area. The Local Municipality is roughly dissected by the (continental) divide between the Upper Vaal and Usuthu / Pongola WMA's. In the north of the Local Municipality, certain sub-catchments drain into the Olifants and Inkomati WMA's.

The headwaters of the Vaal River are found in the western half of the Local Municipality and drain in a southwesterly direction along with the Tweefontein River. The Usuthu River rises in the northeast of the Local Municipality. The headwaters of the Inkomati River flow northwards from the Local Municipality into the Inkomati WMA, and the headwaters of the Olifants and Klein-Olifants River drain the far north-west of the Local Municipality. (Msukaligwa Spatial Development Framework, 2010).

3.5 Geology and Soils

The proposed site location is underlain dolerite intrusive rocks classified as Jd. Dolerite is of basaltic composition, but coarser grained than basalt because it is not extruded as lava from

a volcano but intruded into the earth's crust at lesser or greater depths, and therefore cooled more slowly. It is described as an igneous rock. Furthermore, the site comprises ironised ferricrete. A horizon, at the land surface, made up of the cementation of near surface materials by iron oxides, and often forming a resistant duricrust.

4. LEGAL REQUIREMENTS

This EMPr has been developed to serve as an environmental guiding tool during construction activities. The contractor must take note that conditions as stated in this EMPr are legally binding in terms of the environmental statutory legislation. A hard copy of the EMPr must be kept on site during construction. The legislations that abiding with this EMPr are:

4.1 National Environmental Management Act, 1998 (Act 107 of 1998)

This act prevents the commencement of activity without prior environmental authorisation. Environmental Authorisation was not applied for prior to the construction of informal settlements undertaken therefore a Section 24G rectification process is undertaken to apply for these activities by means of conducting a Section 24G Environmental Authorisation process.

4.2 Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)

The Occupational Health and Safety Act provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work; to establish an advisory council for occupational health and safety; and to provide for matters connected therewith.

4.3 Environmental Conservation Act, 1989 (Act No 73 of 1989) (ECA)

The Environmental Conservation Act provide for the effective protection and controlled utilization of the environment and for matters incidental thereto.

4.5 Animals Protection Act, 1962 (Act No. 71 of 1962)

The Animals Protection Act 71 of 1962 intends to consolidate and amend the laws relating to the prevention of cruelty to animals.

4.6 National Water Act, 1998 (Act No.36 of 1998)

The National Water Act, 1998 (Act No. 36 of 1998) (NWA) aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users. This requires that the quality of water resources is protected as well as integrated management of water resources with the delegation of powers to institutions at the regional or catchment level. The purpose of the Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in responsible ways.

4.6 National Heritage Resources Act, 1999 (Act No. 25 of 1999)

This Act legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 hectares (ha) and where linear developments (including roads) exceed 300 metres in length. The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by SAHRA, the Provincial Heritage Resources Authority. The South African Heritage Resources Authority (SAHRA), as the responsible Heritage Resources Authority, was notified of the proposed project.

4.7 National Environmental Management Act: Biodiversity Act (Act No. 10 of 2004)

The purpose of the Biodiversity Act is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed. This Act is applicable to this application for environmental Authorisation, in the sense that it requires the project applicant to consider the protection and management of local biodiversity.

4.7 National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)

The purpose of this Act is to prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources, while promoting justifiable economic and social development. In addition sustainable development requires that the generation of waste is avoided, or where it cannot be avoided, that it is reduced, re-used, recycled or recovered and only as a last resort treated and safely disposed of.

4.8 Construction Industry Development Board Act, 2000 (Act No. 38 of 2000)

The Construction Industry Development Board intends to implement an integrated strategy for the reconstruction, growth and development of the construction industry and. to provide for matters connected therewith.

4.9 Hazardous Substances Act, 1973 (Act No. 15 of 1973)

This legislation provides for the control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of hazardous substances. Msukaligwa Local Municipality must comply with the regulations included within this regulation.

4.10 Constitution of South Africa 1996 (Act No. 108 of 1996)

The Constitution of the Republic of South Africa has major implications for environmental management. The main effects are the protection of environmental and property rights, the change brought about by the sections dealing with administrative law, such as access to information, just administrative action and broadening of the locus standing of litigants. These aspects provide general and overarching support and are of major assistance in the effective implementation of the environmental management principles and structures of

the NEMA. Section 24 in the Bill of Rights of the Constitution specifically states that: Everyone has the right –

- To an environment that is not harmful to their health or well-being; and
- To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:
- Prevent pollution and ecological degradation.

4.11 Integrated Environmental Management (IEM) IEM

Integrated Environmental Management (IEM) IEM is a philosophy for ensuring that environmental considerations are fully integrated into all stages of the development process. This philosophy aims to achieve a desirable balance between conservation and development (DEAT, 1992). The IEM guidelines intend encouraging a pro-active approach to sourcing, collating, and presenting information in a manner that can be interpreted at all levels. The Department of Environmental Affairs (DEA), Integrated Environmental Management Information Series guidelines were also consulted during this process.



Figure 3: Locality Map of proposed site

5. PHASES OF THE PROJECT

The process which was followed in compiling the EMPr follows NEMA EIA Regulations (2014) and applies the principle of Integrated Environmental Management (IEM). The EMPr deals with the following phases as detailed below:

- To ensure a holistic approach to the management of environmental impacts, during the construction and operational phase.
- The EMPr sets out the methods by which proper environmental controls are to be implemented by the Contractor and all other parties involved.
- The planning and design phase of the weir has already commenced and thus this phase is not discussed further. Each remaining phase of development is discussed in more detail below and has specific issues unique to that phase.

5.1 Planning And Design Phase/ Pre-Construction Phase

Environmental Monitoring Committee needs to be established with representatives of the I&APs, relevant authorities and the holder of an Environmental Authorisation. The role of this EMC is to monitor the environmental compliance during all phases of the project and satisfy as far as possible the issues and concerns of all parties involved in or affected by the project.

5.2 Construction Phase

The construction phase section details the environmental management system/framework within which construction activities will be governed. The construction phase section consists of various actions, initiatives and systems that the contractor will have to ensure are in place and are undertaken. It consists of both a management system and environmental specifications which contain detailed specifications that will need to be undertaken or adhered to by the Contractor. Sound environmental management is orientated around a pragmatic, unambiguous but enforceable set of guidelines and specifications, and for this reason it is imperative that the Contractor, while being bound by the EMPr, fully understands it and has had input into its final development. For this reason, the final construction EMPr will need to be signed off after input from the selected contractor prior to the initiation of construction activities.

5.3 Operational Phase

The operational phase section provides specific guidance related to operational activities associated with a particular development. Negative impacts during the operational phase of a development of this nature will be few and low in intensity. By taking pro-active measures during the construction phase, potential environmental impacts emanating during the operational phase will be minimised. Monitoring of certain issues such as erosion control will be required to continue during operation.

Table 2: Responsibilities and timeframes for the pre-construction phase

Establishment of Environmental Governing Bodies	Responsibility	Timeframe
<p>1. Establishment of Environmental Monitoring Committee (EMC):</p> <p>Establish an Environmental Monitoring Committee with I&APs' representatives. Formal agreement regarding the frequency of meetings and agenda must be reached.</p>	<p>Environmental consultant(s)/specialist(s)</p>	<p>During the lifetime of the project (from pre-construction through operation and maintenance phases).</p>
<p>2. Appointment of Environmental Control Officer (ECO): Developer to appoint the ECO for the project.</p>	<p>Developer</p>	<p>Pre-construction, construction and operation and maintenance phases.</p>
<p>3. Establishment of a complaints register:</p> <p>Environmental complaint register to be maintained:</p> <ul style="list-style-type: none"> ✓ All complaints with regards to environmental non-compliance on the construction site need to be recorded and addressed accordingly. ✓ Establish an Environmental complaints register. ✓ Address complaints from time to time and report back to EMC meetings. ✓ Open liaison channels should be identified and developed to ensure that all queries, complaints from affected individuals/ parties may be addressed with the shortest possible delay. 	<p>Site engineer and contracts managers will be responsible for maintaining the register and report any complaints received to the ECO</p>	<p>During construction, operation and maintenance phases</p>

6. ENVIRONMENTAL MITIGATION AND MANAGEMENT MEASURES

The environmental mitigations and management measures will be used as guidelines, will form the basis for environmental mitigation and management on site. The appointed Environmental Control Officer (ECO) will ensure that any modifications are communicated, explained to and discussed with all the Interested and Affected Parties (i.e. the authorities, contractor, the proponent and any directly affected party who requests this information).

- Mitigation of the potential impact in regard to the
- Potential to mitigate any negative impacts
- Potential to optimize any positive impacts
- The likelihood of successful mitigation
- Overall assessment and general comments as to the predicted impacts of the development after mitigation in terms of such criteria as may be relevant to a particular impact, and which may include the following aspects:
 - The severity and permanence of the impact on either local biota or surrounding human communities
 - The size of the affected communities and their relative significance
 - The general ecological and socio – economic context within which a particular impact would occur
 - The final balance of between positive and negative impacts, and related costs and benefits to society.

Table 3: Identified Impacts during Construction phase

ENVIRONMENTAL IMPACT/ASPECTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	TIMEFRAME	COMMENT ON THE OVERALL ASSESSMENT AND CONCLUSION
1. Compliance to legislation	<ul style="list-style-type: none"> ✓ The contractor will be informed to rehabilitate the impacted region. ✓ A copy of the warning letter will be forwarded to the Principal Agent of the project Should no improvement be noted by the next site visit the following actions will take place: ✓ A STOP ORDER will be issued by the ECO to the contractor and all construction activities that are related to the identified activity of non-compliance will cease 	Contractor and ECO	Daily	When an issue of non-compliance be found on site the ECO has the authority to: Issue a warning letter and site instruction to the contractor to cease the activity,
2. vegetation	<ul style="list-style-type: none"> ✓ Removal of vegetation should be confined to the proposed construction areas. The removal of vegetation close to the slopes should be kept to the minimum. ✓ Areas to be cleared of vegetation must be demarcated prior to the commencement of construction, in line with the approved Construction Site Development Plan. ✓ Protected tree species may only be removed after a permit from the Department of Agriculture Fisheries and Forestry (DAFF) has been obtained. ✓ Large indigenous trees should be retained as far as possible during the construction and operation phase. ✓ No exotic/invasive plants are to be planted on common ground 	Contractor and ECO	During construction	The Contractor is obligated to remove any existing and any new alien vegetation that has established as a result of the construction activities.

	<p>of the site.</p> <ul style="list-style-type: none"> ✓ Clearing of vegetation should be kept to a minimum, keeping the width and length of the earth works to a minimum. ✓ All areas falling outside of the demarcation must be designated as no-go areas. ✓ Areas outside the development footprint, and disturbed by construction activities, must be rehabilitated. Such rehabilitation must make use of indigenous plant species ✓ Where soils are slow to re-vegetate, these areas should be grubbed and planted with grass seed suitable for the region. 			
3. Protection of fauna	<ul style="list-style-type: none"> ✓ Breeding sites must be kept intact and disturbance to breeding birds must be avoided. ✓ Special care must be taken where nestlings or fledglings are present; ✓ No poaching must be tolerated under any circumstances. ✓ All animal dens in close proximity to the works areas must be marked as Access restricted areas; 	Contractor	During construction	Animals existing in the area must be protected by all means.
4. Noise	<ul style="list-style-type: none"> ✓ Construction and other noise generating activities should be restricted to between 06h00 and 18h00 Monday to Friday, unless otherwise approved by the appropriate competent person in consultation with adjacent landowners/affected persons and ECO. ✓ During the operational phase all activities must take place in a manner that will allow as little noise as possible. ✓ Activities, which are deemed to generate high levels of noise, 	Contractor	During construction	If construction vehicles are serviced and properly maintained the level of noise should be less.

	will be restricted to normal working hours.			
5. Air quality	<ul style="list-style-type: none"> ✓ The liberation of dust into the surrounding environment shall be effectively controlled by the use of, water spraying. ✓ The speed of haul trucks and other vehicles must be strictly being controlled to avoid dangerous conditions, excessive dust or deterioration of the road being used. ✓ Site clearance to be done only as needed in phases. ✓ Dust minimisation and control measures should be implemented on the construction site at regular intervals. This could include irrigation by water tankers. ✓ The frequency of implementation of dust suppression measures should be increased when it is expected that high wind conditions will develop. ✓ Vegetation clearing shall take place in a phased manner in order to retain vegetation cover for as long as possible 	Contractor	During construction	The level of dust should be reduced to minimal as the result of water spraying during working hours and pilling of soil should be avoided wherever possible.
6. Soil disturbance	<ul style="list-style-type: none"> ✓ The Contractor shall remain within the development footprint. ✓ Topsoil should be removed and kept for replanting once complete where feasible and practical. ✓ Should there be soil stockpiles, these shall be convex in shape and no more than 2m in height. Stockpiles shall be shaped so that no surface water ponding can take place. ✓ Topsoil stockpiles (if any) shall be protected from erosion by wind and rain by providing suitable stormwater and cut-off drains (approved by the ER) and/or the establishment of temporary indigenous vegetation. ✓ Topsoil stockpiles (if any) shall be monitored regularly to identify 	Contractor	During construction	Soil disturbances outside the development footprint are minimised.

	<p>any alien plants. If any establish, these must be removed when they germinate to prevent contamination of the soil. Before topsoil is to be re-used the stockpiles should be fertilised.</p> <ul style="list-style-type: none"> ✓ Any topsoil contaminated by hazardous substances shall not be used but shall be disposed of at a registered hazardous landfill site. Proof of appropriate disposal must be filed in the contractors camp. ✓ The Contractor shall be held responsible for the replacement, at his expense, of any unnecessary loss of topsoil due to his failure to work according to the requirements of this EMPr. Soil must be stockpiled in such a way as to minimize erosion 			
6. Soil erosion	<ul style="list-style-type: none"> ✓ During construction, the Contractor shall protect all areas susceptible to erosion by installing necessary temporary and permanent drainage works as soon as possible and by taking any other measures necessary to prevent stormwater from concentrating in streams and scouring slopes and steep banks. ✓ Stockpiled topsoil should not be compacted and should be replaced as final soil layer. ✓ Soil should be exposed for the minimum time possible once cleared of vegetation, i.e., the timing of clearing and grubbing should be co-ordinate as much as possible to avoid prolonged exposure of soils to wind and water erosion. ✓ Any runnels or erosion channels developed during the construction or maintenance period shall be backfilled and compacted and the areas restored to a proper condition like the 	Contractor	During construction	The design lay out plan should address all issues relating to storm water management and soil erosion. This could be a complete mitigation of this soil erosion.

	<p>condition before the erosion occurrence.</p> <ul style="list-style-type: none"> ✓ Stabilisation of cleared areas to prevent and control erosion and/or sedimentation shall be actively managed. ✓ The method of stabilisation shall be determined in consultation with the Project Engineer. ✓ Consideration and provision shall be made for the following methods (or combination thereof): Brushcut packing; Mulch or chip cover; Straw stabilising; Watering, planting or sodding; Soil binders; Anti-erosion compounds; Mechanical cover; ✓ The A-horizon will be removed and used for rehabilitation purposes. The lower soil horizons will be used for construction activities. The A-horizon will be stockpiled in a responsible manner and replaced during rehabilitation. ✓ In areas where construction activities have been completed and where no further disturbance would take place, rehabilitation, and re-vegetation (comprising the replacement of topsoil and grass planting) must commence as soon as possible. 			
<p>7. Waste generation and disposal</p>	<ul style="list-style-type: none"> ✓ A waste management plan to be developed for the construction site. ✓ Recyclable waste must be deposited in separate bins. Recyclable material includes paper, tins and glass. ✓ Refuse must be disposed of at a Municipal registered landfill site, which is also approved of by the local authority. Refuse may not be burned or buried on or near the site. ✓ The contractor shall be responsible for the establishment of a refuse control and removal system that prevents the spread of 	<p>Contractor</p>	<p>During construction</p>	<p>Waste removal should be done regularly and that could make the environment free from any hazards. This could completely mitigate this impact.</p>

	<p>refuse within and beyond the construction site</p> <ul style="list-style-type: none"> ✓ Refuse bins must be watertight, wind-proof and scavenger proof and shall be appropriately placed throughout the site and shall also be conspicuous. ✓ Hazardous waste, consisting of substances that may be harmful to the receiving environment, and therefore require precautionary measures when handled. Examples include (but not limited to) oil, paint and diesel. 			
8. Mixing of concrete	<ul style="list-style-type: none"> ✓ Where concrete has been mixed, especially in the natural environment, all residues must be removed and disposed of in an environmentally responsible manner approved by the ECO. 	Contractor	During construction	Unused cement should not be left to dry on the ground. If proper housekeeping rules are complied with, most impacts should not affect the environment.
9. Sewage disposal	<ul style="list-style-type: none"> ✓ The contractor to install adequate portable chemical toilets to meet the sanitation needs on the construction site (14 people per toilet). ✓ All solid waste will be collected at a central location at each construction site and will be stored temporarily until removal to an appropriately permitted landfill site in the vicinity of the construction site. 	Contractor	During construction and maintenance	Ablution facility must be made available during construction phase for the employee. All type of waste should be classified and disposed in an appropriate registered waste disposal site.

<p>10. Hazardous substances</p>	<ul style="list-style-type: none"> ✓ Hazardous materials to be stored correctly, marked, labelled, without the risk of contamination and hazardous waste to be disposed of correctly with the necessary certificates issued. ✓ All oils, hydraulic fluids and other hazardous materials will be stored in suitable containers in a structure or facility designated for this purpose. ✓ Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. ✓ Storage areas containing hazardous substances must be clearly signed and the designated person contact and names should be displayed. ✓ Residents living adjacent to the construction site must be notified of the existence of the hazardous storage area. ✓ Staff dealing with these materials/substances must be aware of their potential impacts and follow the appropriate safety measures. ✓ Contaminated soil should be removed and disposed of as per hazardous waste disposal requirements 	<p>Contractor in co-operation with the ECO</p>	<p>During construction</p>	<p>Employees dealing with hazardous substances should be trained and be competent to do so. This could completely mitigate reduce the risk posed by this impact.</p>
<p>11. Contamination of groundwater resources</p>	<ul style="list-style-type: none"> ✓ A Method Statement (MS) for the handling, storage and management of hazardous substances during the construction phase must be drawn up by the appointed Contractor and approved by the Engineer and submitted to the ECO, prior to the commencement of construction. ✓ This MS must, as a minimum, include the following: 	<p>Contractor</p>	<p>Construction and operational phase</p>	<p>Groundwater resources are not negatively impacted by the construction of the facility.</p>

	<ul style="list-style-type: none"> ○ A list of all potentially hazardous materials to be used during the construction phase; ○ Provision for all potentially hazardous materials (including cement and solvents) to be housed under cover and within bunded areas; and ○ Reasonable measures to prevent potential spills of these substances. <ul style="list-style-type: none"> ✓ All potentially hazardous materials must be handled, stored and managed in line with the approved MS. ✓ A Spill Contingency Plan must be developed by the Contractor and approved by the Engineer. ✓ This plan/procedure must detail measures for the immediate clean-up of spills, as well as the appropriate storage and disposal of contaminated material, to prevent environmental pollution or contamination. ✓ All spills must be cleared up, stored, and disposed of in accordance with the approved spill contingency procedure. ✓ Drip trays will be placed underneath all stationary plant (excavators, trucks and mobile cranes) whether they are in operation or not. ✓ Drip trays will also be in place where fuel is transferred. The contents of drip trays will be appropriately disposed of in a manner that prevents environmental pollution or contamination. ✓ All maintenance of construction vehicles, plant and equipment 			
--	---	--	--	--

	<p>will take place off site.</p> <ul style="list-style-type: none"> ✓ Only emergency work on vehicles, plant or equipment may be allowed on site. ✓ If concrete or cement mixing is to be undertaken on the site, this must be undertaken on an impermeable surface. ✓ Any contaminated water generated by these activities must be contained and appropriately treated / disposed of. ✓ No contaminated water may be discharged to the environment. ✓ At the end of each day, any leftover / unused cement is to be removed from the site for appropriate disposal by the concrete supplier. 			
<p>12. Storm water runoff</p>	<ul style="list-style-type: none"> ✓ To prevent storm water damage, the increase in storm water run-off resulting from construction activities must be estimated and the drainage systems assessed accordingly. ✓ A drainage plan must be submitted to the Engineer for approval and must include the location and design criteria of any temporary stream crossing. ✓ All storm water runoff from compacted materials must be monitored if signs of erosion become apparent. ✓ Drip trays will be placed underneath all construction plant (excavators, trucks and mobile cranes) whether they are in operation or not. Drip trays will also be in place where fuel is transferred. ✓ The contents of drip trays will be appropriately disposed of in a manner that prevents environmental pollution or 	<p>Contractor</p>	<p>During construction</p>	<p>This should be able to address soil erosion as well as the design of the site should have appropriate storm water management as well as drainage system that should have oil trap/ filters if necessary.</p>

	<p>contamination.</p> <ul style="list-style-type: none"> ✓ Only emergency work on vehicles, plant or equipment may be allowed on site. If concrete or cement mixing is to be undertaken on the site, this must be undertaken on an impermeable surface. ✓ Any contaminated water generated by these activities must be contained and appropriately treated/ disposed of. ✓ No contaminated water may be discharged to the environment. 			
13. Storage of equipment and materials	<ul style="list-style-type: none"> ✓ Choice of location for storage areas must consider prevailing winds, exposure sun, distance to water bodies and general onsite topology. ✓ All equipment and materials must be stored in a designated area in an appropriate manner as to prevent pollution. ✓ Storage areas must be designated, demarcated, and fenced as effective as possible. ✓ Fire prevention facilities must be always present and accessible. 	Contractor	Throughout the lifecycle of a project	If employees on site shall practice good housekeeping behaviour, the work condition will be free of injuries, and everything would be in its place and there will be space for everything.
14. Vehicle maintenance and refuelling	<ul style="list-style-type: none"> ✓ Vehicle maintenance and equipment handling to be carried out in areas especially equipped for this purpose to prevent spillage and contamination. ✓ All oil changes, lubrication and maintenance will take place only at the designated areas. ✓ Refuelling of vehicles will and must take place at the designated refuelling area. ✓ This area will have a sufficiently impermeable surface to prevent seepage into ground water. The refuelling area will be bounded to prevent any surface water from running over this area. 	Contractor	During construction	The impact must be completely mitigated or reduced form posing danger to the environment.

<p>15. Vehicle and equipment washing</p>	<ul style="list-style-type: none"> ✓ Washing of vehicles and equipment should be done in one place and if ever spillages of detergents occur then cleaning up should be considered immediately 	<p>Site workers</p>	<p>During construction</p>	<p>If the washing of vehicles and equipment is done in an appropriate manner and detergents are always sealed then the negative impact would be low or no more.</p>
<p>16. Labour force</p>	<ul style="list-style-type: none"> ✓ Access to the site should be restricted to employees of the contractor. ✓ Temporary ablution facilities to be provided at appropriate sites (one toilet for 14 labourers). ✓ Such ablution facilities to be kept away from natural water bodies. ✓ Cooking facilities to be provided in demarcated areas. ✓ All labour will undergo basic induction, where safety, health and environmental issues will be discussed. ✓ Construction staff should be educated, prior to commencement of construction, as to the need to refrain from destruction or killing of animals and plants, as well as from indiscriminate defecation, waste disposal and / or pollution of local soil and water sources. ✓ The contractor should always ensure proper supervision of employees. 	<p>Contractor</p>	<p>During construction</p>	<p>Skills and knowledge must be gained by these employees who assist in building local communities.</p>

17. Temporary jobs	<ul style="list-style-type: none"> ✓ Local labour and contractors must be used wherever possible. Basic skills development and capacity development must be incorporated with this. ✓ It will be a specific condition in the contractors' agreements that local labour be used wherever possible. ✓ All reasonable attempts will be made to appoint people from the local communities as temporary labourers for non-specialize tasks and they will be subject to the necessary basic skills training. 	Contractor	During construction	Local labourers must be given priorities.
18. Security and crime	<ul style="list-style-type: none"> ✓ Members of the community should be hired to patrol the premises during construction and maintenance. ✓ The access of unauthorized individuals must be minimized. 	Contractor	During construction and maintenance	Crime could be reduced or completely eradicated by the improvement of security system.
19. Fire prevention and control	<ul style="list-style-type: none"> ✓ Contractor must make sure that there is supervision for all fires that are used in the construction camp. ✓ Smoking should be prohibited in the vicinity of flammable substances. ✓ The contractor should ensure that fire-fighting equipment is available on site, in particular where flammable substances are stored. ✓ Fires started for comfort(warmth) should be discouraged by the contractor, due to the risk of vegetation fires and risk to adjacent property ✓ Fire-fighting equipment and emergency plans must be in place prior to the construction phase. 	Contractor	During construction	Every public structure must have fire prevention measures in place the presence of this facility is a necessity.

	<ul style="list-style-type: none"> ✓ The contractor will plan and implement a fire prevention program and develop a contingency plan in the event of any fire. ✓ No refuse or waste must be burnt on site. ✓ The contractor will be responsible for all damages caused by the outbreak of a fire originating from a site where work is undertaken. Damage to adjacent properties will be to his account. ✓ The contractor is to provide cooking areas where fire risks will be minimized and controllable. 			
20. Safety and access control	<ul style="list-style-type: none"> ✓ Safety equipment must be provided to all employees to prevent personal injury during construction activities. This includes equipment such as protective eye and ear wear and protective clothing where necessary. ✓ Staff should be appropriately trained in all assigned activities. ✓ Access to dangerous excavations and materials, must be controlled by the site manager. ✓ No other access routes must be constructed. Construction vehicles must be limited to approved access routes and areas on the site to minimise excessive environmental disturbance to the soil and vegetation on or close to the site. ✓ All personnel and vehicles used for transportation and/or construction purposes should remain within the demarcated areas. ✓ Excavations should only remain open for a minimum period of time and during this time the must be clearly demarcated so as 	Contractor	During construction	Safety and Access control will be management according to the requirement.

	to prevent accidental ingress of people and animals.			
21. Material handling	<ul style="list-style-type: none"> ✓ Re-fuelling and maintenance of vehicles must take place off site. ✓ No oils, chemicals or other hazardous materials used during construction are to be stored on site. 	Contractor and site workers	During construction	If employees will be properly trained to handle material this could avoid any incidents from occurring.
22. Survey points	<ul style="list-style-type: none"> ✓ Roads or trails that are cut to provide temporary access for survey work must be minimized. ✓ Vegetation clearing must be kept to a minimum during survey operations. 	Contractor	During construction	Construction will only take place on the proposed or demarcated area.
23. Constructi on camp	<ul style="list-style-type: none"> ✓ The choice of the site for the contractors' camp requires the Engineers permission and must consider location of villagers and or ecological sensitive areas, including flood zones and unstable zones. ✓ The size of the construction camp should be kept to a minimum. ✓ No camp or office site shall be located closer than 200m from a stream or any drainage line; ✓ The contractor must attend to the drainage of the camp to avoid standing water and or sheet erosion. ✓ If construction camp is required in the study area, the contractor must establish a construction camp in an area as agreed with the ECO. ✓ The site for the construction camp must not be in an environmentally sensitive area such as proximity to a 	Contractor and engineers	During construction	The site will be accessible and pose less impact on the environment if chosen in a correct place. The engineers must be responsible to ensure that the chosen place has less or no environmental impact.

	<p>watercourse, on a steep slope or on erosive soils.</p> <ul style="list-style-type: none"> ✓ The area must be properly demarcated prior to establishment to prevent the construction camp from being unnecessarily large. The camp must be properly fenced. ✓ The construction camp must not be established along the water courses. ✓ To prevent excessive disturbance of natural vegetation, the contractor should use existing disturbed or paved areas wherever possible. 			
24. Fencing of construction camp	<ul style="list-style-type: none"> ✓ Fencing of the entire construction area will be required as a means of ensuring safety and restricting trespassers. ✓ The fencing however will be ecologically sensitive to ensure that species habitat is not divided. ✓ Fences will be clearly demarcated, and appropriate signage will be displayed, similar to the signs in the images below. ✓ The necessary signage will also be erected in the vicinity of the sites to ensure visitors can easily and safely access the premises. 	Contractor	During construction	The fencing must be made ecologically sensitive to ensure that species habitat is not divided.
25. House keeping	<ul style="list-style-type: none"> ✓ The Construction Site and surrounds are to be always maintained in a clean orderly and presentable condition. ✓ Regular inspections by the Contractor (and ECO) will be undertaken using checklists to ensure a minimum standard of orderliness is maintained. 	Contractor	During construction	Construction activities shall avoid causing unnecessary disruption and nuisance to adjacent landowners and the public.
26. Workers conduct on	<ul style="list-style-type: none"> ✓ A general regard for the social and ecological well-being of the site and adjacent areas is expected of the site staff. 	Contractor	During construction	Workers will be provided sufficient awareness

<p>site</p>	<ul style="list-style-type: none"> ✓ Workers need to be aware of the following general rules: ✓ No alcohol / drugs to be present on site. ✓ No firearms are allowed on site or in vehicles transporting staff to or from the site (Unless used by the security personnel). ✓ Prevent excessive noise. ✓ No harvesting of firewood from the site or from the areas adjacent to it. ✓ Other than per-approved security staff, no workers shall be permitted to live on site. 			<p>training.</p>
<p>27. Destruction of wetlands, pans and their associated buffer areas</p>	<ul style="list-style-type: none"> ✓ Avoid loss of wetlands, pans and wetland buffers Minimise the risk of soil destabilisation and sedimentation of wetlands. ✓ All construction activities must remain within the boundaries of the development area, as demarcated at the start of construction. ✓ Wetland areas should be demarcated and marked as “no go” area. ✓ No water should be abstracted from any drainage lines, wetlands and pans. ✓ No stockpile areas should be located within drainage lines, wetlands and pans, or within the associated buffer zone. ✓ No hazardous materials (such as oil) should be kept within 50m of the edge of a wetland buffer zone ✓ No construction camps should be located within the 1:100 year 	<p>Project developer</p>	<p>During construction</p>	<p>Upon completion of this EMP the project developer has optimised their project footprints to avoid ecologically sensitive areas identified by the specialist (pans, hillslope seep, with 100 – 200 m buffers as specified).</p>

	floodline of a watercourse or a wetland			
28. Alien invasion	<ul style="list-style-type: none"> ✓ All invader plant species must be removed from the site. Communal landscaping within the development must be done with indigenous vegetation. ✓ Alien species should be removed from any working areas and the site camp(s). ✓ Alien vegetation species should also be eradicated when they establish themselves in disturbed areas (disturbance of the natural vegetation will encourage the establishment of invasive species). ✓ To discourage the spread of alien species, soil should not be moved from one part of the site to another without the consent of the ECO ✓ The Contractor is obligated to remove any existing and any new alien vegetation that has established as a result of the construction activities. ✓ The cleared vegetation must be disposed of at an appropriate landfill. ✓ Manual control involves physical activities (i.e. harvesting) such as hand-pulling, digging, flooding, mulching, manual destruction or removal of nests, egg masses, or other life stages; generally includes the destruction of invasive species by hand. 	The project developer	During construction	Monitor and implement prevention programs for identified priority invasive species and areas.
29. Stock piling	<ul style="list-style-type: none"> ✓ Ensure that excavated and stockpiled soil material is stored and beamed on the higher lying areas of the site and not in any storm water run-off channels or any other areas where it is likely 	Contractor	During construction	Topsoil stockpiles (if any) shall be monitored regularly to identify any

	to cause erosion or where water would naturally accumulate			alien plants.
30. Visual and aesthetics	<ul style="list-style-type: none"> ✓ generation of dust will increase the visibility of the project, and it is therefore important to employ techniques to suppress dust generation during construction. ✓ The contractor should maintain good housekeeping on site to prevent litter and minimise waste. ✓ Erosion risks should be assessed and minimised as erosion scarring can create areas of strong visual contrast with the surrounding vegetation. Equipment not being used should be removed from site. ✓ The contractor should maintain good housekeeping on site to prevent litter and minimise waste. ✓ Erosion risks should be assessed and minimised as erosion scarring can create areas of strong visual contrast with the surrounding vegetation; and ✓ Equipment not being used should be removed from site. 	Contractor	During construction	The contractor should maintain good housekeeping on site to prevent litter and minimise waste.
31. Ablution facilities	<ul style="list-style-type: none"> ✓ Portable chemical toilets must be provided for the construction workforce. ✓ These facilities must be regularly serviced by an appropriate service provider. Ablutions must be provided in accordance with the requirements of the Occupational Health and Safety Act (OHSA,1993). ✓ The construction of long drop toilets is forbidden. ✓ The Contractor shall be responsible for ensuring that all ablu 	The contractor	During construction	Ablution facilities may not be placed within the 1:100-year floodline.

	<p>facilities are maintained in a clean and sanitary condition to the satisfaction of the Project Engineer.</p> <ul style="list-style-type: none"> ✓ Evidence of appropriate management (in the form of service receipts / waybills) must be maintained and presented to the ECO during audits. ✓ Ablution facilities may not be placed within the 1:100-year floodline. ✓ Sanitation facilities should be well maintained and serviced, any breakages or leaks should be fixed immediately to prevent loss of containment. 			
32. Damage of subsurface heritage resources	<ul style="list-style-type: none"> ✓ Should any human remains and/or other archaeological and historical material be exposed, during any phase of construction work, then work must cease in the immediate area and it must be reported to the archaeologist to the Heritage Resources Authority immediately, so that a systematic and professional investigation can be undertaken. ✓ The developer must finance the costs should additional investigations be required. ✓ Should any fossil remains be discovered, during any phase of construction, either on the surface or exposed by excavations the Chance Find Protocol must be implemented by the ECO in charge of these developments. These discoveries ought to be protected (if possible, in situ) and the EC must report to SAHRA. ✓ The Contractor will be required to abide by the specifications as set out by the Competent Authority or the heritage specialist 	Contractor	During construction	Sub-surface heritage resources uncovered by excavation (if any) must not be damaged or destroyed.

	<p>appointed to investigate the find.</p> <ul style="list-style-type: none"> ✓ The Contractor may not, without a permit issued by the relevant heritage resources authority, destroy, damage, excavate, alter, deface or otherwise disturb archaeological material. 			
33. Water supply	<ul style="list-style-type: none"> ✓ The Contractor shall make available safe drinking water fit for human consumption at the site offices and all other working areas. ✓ All drinking water must be from a legal source and comply with recognised standards for potable use. ✓ If water is stored on site, drinking water and multi-purposed water storage facilities shall be clearly distinguished and demarcated. 	Contractor	During construction	A sustainable and lawful water supply will be utilised.
34. Excavation	<ul style="list-style-type: none"> ✓ After all foreign matter has been removed from site; excavations shall be backfilled with subsoil, compacted and levelled with previously stored topsoil. ✓ No foreign matter such as cement or other rubble shall be introduced into such backfilling. the areas shall be cleared of any contaminated soil. ✓ The surface shall then be ripped or ploughed to a depth of at least 300mm and the topsoil previously stored adjacent to excavations, shall be spread evenly to its original depth over the whole area. ✓ The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora. Where sites have been rendered devoid of vegetation or where soils have been 	Contractor	During construction	Excavations shall be backfilled with subsoil, compacted and levelled with previously stored topsoil.

	<p>compacted by heavy machinery, the surface shall be scarified and ripped.</p> <ul style="list-style-type: none"> ✓ Rehabilitation of the new landscape would be done in such a manner to blend in with the surrounding landscape and allow normal surface drainage to continue. ✓ Water control systems must be implemented to prevent erosion. The visual impact would be addressed by means of: re-vegetation with grasses removal of any infrastructure, scrap, waste that would contribute to a negative impact. 			
35. Landscaping	<ul style="list-style-type: none"> ✓ All disturbed areas or areas, which have been engineered for the purpose of the development, must be rehabilitated with indigenous vegetation, which must be sourced from surrounding areas where possible. ✓ This will aid in preventing erosion within the site. All plant material must be obtained either from nurseries; from a phased "Search and Rescue" operation on the site prior to clearing; or, from an area near, and of the same veld type as, the site, as indicated by the Engineer/ ECO. ✓ The seed mix must therefore consider the availability of indigenous grass seeds as per the above, different soil situations and the prevailing climatic conditions of the area ✓ The planting of alien plant species for landscaping purposes will not be permitted. Only grass species that are indigenous to the study area should be used for the creation of lawns 	Contractor	During rehabilitation phase	Disturbed areas or areas, which have been engineered for the purpose of the development, must be rehabilitated with indigenous vegetation.
36. No go area	<ul style="list-style-type: none"> ✓ Areas where construction activities are prohibited are referred to as no-go areas. ✓ Entry into these areas by any person, vehicle or equipment 	Contractor	During construction	Areas where construction activities are prohibited are

	<p>without the Employer's written permission will result in penalty.</p> <ul style="list-style-type: none"> ✓ All no go areas must be demarcated by temporary fencing and appropriate signage. ✓ All private property outside of the construction areas including any detour routes as set out in the site layout plan is considered as a no go area. ✓ Additional no go areas may be declared at any time during construction phase as deemed necessary. 		phase	referred to as no-go areas such as wetlands.
--	--	--	-------	--

Table 4: The table below indicates the identified impacts and mitigation measures that could occur during operational and maintenance phase

IMPACT AND PROPOSED MITIGATION AND MANAGEMENT ACTIONS	RESPONSIBLE PERSON	TIMEFRAME
<p>1. Storm water management: It is recommended that proper storm water drainage system be ensured during operation and maintenance phase. Storm water should not be allowed to discharge onto bare soil but must be diverted to the surrounding grasslands or to the landscaped gardens during the operational phase.</p>	Developer and contractor	During operation and maintenance
<p>2. Clean-up action: In the event of incident or leakage of hazardous waste from storage site, a professional company to be appointed to remove and clean up the waste as quickly as possible.</p>	Developer and contractor	During both construction, operation and maintenance phases
<p>3. Waste generation and disposal: Solid waste generated during operation and maintenance phase must be removed in a continuous and efficient manner to the satisfaction of the local municipality. A waste management plan to be developed and maintained for the construction site. No solid waste should be dumped on the site. All domestic waste generated on the site should be disposed of in a proper manner off site i.e. no burial on site.</p>	Developer and contractor	During construction, operation and maintenance
<p>4. Maintaining environmental complaint register: The environmental complaint register must be maintained during the operation and maintenance phase.</p>	Developer	Operation and maintenance
<p>5. Maintenance of access roads: Access/ alternate roads to be maintained with an acceptable free of erosion, and no surface water pounding.</p>	Developer	Operation and maintenance
<p>6. Traffic: Any traffic disruptions due to the movement of heavy machinery should be undertaken with the approval of all relevant authorities and in accordance with all relevant legislation. All signage and road markings for the proposed site should be in accordance with the South African Road</p>	Local municipality	During operation and maintenance.

Traffic Signs Manual		
<p>7. Job creation</p> <p>permanent employment opportunities for customer service agents on the forecourt, staff at the convenience store kiosk as well as other administrative staff. Given that the number of employment opportunities is relatively small, but permanent in nature, this is a positive impact of low intensity.</p>	Contractor and developer	During operation and maintenance
<p>8. Risks of Fires & Explosions</p> <p>Fire extinguishers must be easily accessible, and all vehicles should have fire extinguishers. Employees should be trained on fire safety and there should be fire marshals. The management must adhere to an Emergency Response Plan. All staff must be adequately trained in the implementation of this plan. The following signs must be installed</p>	Operator	Operation and maintenance

7. MANAGEMENT AND MONITORING PROCEDURES

This section focuses on the systems and procedures required to ensure that the environmental specifications contained in the EMPr are effectively implemented, monitored and recorded.

General Monitoring and Reporting

The appointed ECO as well as the contractors on site are responsible for ensuring compliance with the EMP. Monthly EMPr compliance reports (audits) will be compiled by the ECO and submitted to the contractor for his/her review and correction of non-compliance issues. It is the responsibility of the ECO to report any non-compliance, which is not correctly rectified to the contractor. Interested and Affected Parties (I&APs) have the right to monitor specific aspects of the EMPr (e.g. noise regulations, working hours stipulated) and must be allowed access to the EMPr document in conjunction with the contractor in a reasonable and informal manner, without unreasonably disrupting construction activities.

The contractor shall keep a record of all complaints received from the community and communicate them to the ECO. These complaints must be addressed and mitigated within reason. Records relating to the compliance/non-compliance with the conditions of the EMPr as well as audits reports shall be kept in good order. It is suggested that all records be kept for at least two years following construction activities for reference purposes.

7.1 Specific Roles and Responsibilities

The roles of the responsible people on site are included below:

7.1.1 Applicant

- The applicant shall ensure that the EMPr forms part of all contract documents;
- The applicant must ensure that the contractor and his/her subcontractors comply with all the environmental specifications outlined in this document;
- Assume overall responsibility for the effective implementation and administration of the EMPr;
- Ensure construction personnel are trained in accordance of the requirements of the EMPr.

7.1.2 The Contractor

The contractor is responsible for complying with the EMPr during the construction phase of the development. The contractor is responsible for ensuring that his/her sub-contractors and their employees appointed by him/her are familiar with the EMPr and that they abide to conditions as set out in the EMPr. The contractor will be responsible for any non-compliance with the EMPr and will pay for any remedial work that may result from non-compliance resulting directly from his/her negligence.

7.1.3 Project Manager

The project Manager is responsible for overall management of project and EMPr implementation and has the following tasks:

- Be familiar with the recommendations and mitigation measures of this EMPr, and implement them;
- Monitor site activities on a daily basis for compliance;
- Conduct internal audits of the construction site against the EMPr
- Confine the construction sites to the demarcated areas.

7.1.4 The Environmental Control Officer (ECO)

ECO is responsible for communicating environmental issues associated with the site to the contractor and his subcontractors. The ECO is responsible for the explanation of environmental issues contained in this EMP to anyone working on the site. Should any non-compliance with the EMP take place, the ECO must communicate this with the party responsible for the non-compliance as well as the contractor. If the non-compliance continues after written request by the ECO to rectify the situation, the ECO must inform the local / provincial environmental authority in writing. Should any issues arise on the site of an environmental nature or concern, the ECO will be responsible for taking the appropriate action.

7.1.5 Resident Engineer (RE)

The Resident Engineer (RE) will be appointed by the 'Consultant' and will be required to oversee the construction programme and construction activities performed by the Contractor. The RE is expected to liaise with the Contractor and ECO on environmental matters, as well as any pertinent engineering matters where these may have environmental consequences. He/she will oversee the general compliance of the Contractor with the EMPr and other pertinent site specifications. The RE will also be required to be familiar with the EMPr specifications and further monitor the Contractor's compliance with the Environmental Specifications on a daily basis, through the Site Diary, and enforce compliance.

7.1.6 Inspection

Periodic inspections will be performed by the ECO. These will consist of formal reviews of conformance against policies and procedures stated in this document. Inspections will occur on a monthly basis (or as required). Supervisors in all work areas will conduct performance and compliance reviews, using the EMP as guideline to ensure compliance.

7.1.7 Record Keeping

Documents to be maintained by the designated representative/ site agent and are to Include:

- Training records
- Inspection records
- Records of non-conformance and corrective action

- Records of all complaints, concerns or issues and corrective action
- Environmental Management Plan
- All incidents reports All records will be kept for up to a year after the completion of the project or in accordance with other legal requirements as they apply.

7.1.8 The Local/Provincial Environmental Authority

The local/provincial Environmental Authority responsible for taking action against any non-compliance with the EMP by the Applicant, the Contractor or any of his/her subcontractors. The Local/Provincial Authority can request a compliance audit to be undertaken on the site at any time during the development phase of the project.

Table 5: method of monitoring

TIMEFRAME	METHOD OF MONITORING	RESPONSIBILITY	MONITORING FREQUENCY
External Monitoring by ECO			
Planning, design and preconstruction	A site visit and associated pre-construction audit report to be prepared immediately prior to the start of construction. The report will document existing pre-construction conditions and any non-compliance to be addressed prior to the start of construction.	ECO	Once off Once off
Construction	Minimum of monthly site visits with an audit report generated and submitted to the Project Team for the duration of construction.	ECO	Monthly
	Monitoring of dust must be conducted daily and waste and erosion weekly. Responsibility:	Contractor	Weekly and daily
	Monitoring the success of traffic management measures.	Contractor/ECO	As frequently as possible
	Monitoring of machinery for leaks and areas for hydrocarbon spills	Contractor	Daily
Operation	Monitoring of the system to ensure leaks, system failures etc. are identified early.	Project developer	Frequently

8. REHABILITATION

After construction, any area cleared or disturbed (as a result of the construction activities) within and outside the boundaries of the construction site shall be rehabilitated. The contractor shall be responsible for cleaning the contractor's camp and construction site of all structures, equipment, residual litter and building materials at the end of the contract and where necessary and appropriate, the ground scarified, topsoil restored and indigenous

vegetation re-established. All construction equipment and excess aggregate, gravel, stone, concrete, bricks, temporary fencing and the like shall be removed from the site upon completion of the work. No discarding or burying of materials of whatsoever nature shall be allowed on the site, or on any vacant or open land in the area. Such materials may only be disposed of at the appropriate registered waste disposal site.

9. GENERAL CONDUCT

Each member of the work force will be subjected to a project orientation period prior to commencing work on the site. The orientation shall include a discussion on environmental matters of concern on this project. The ECO, with the assistance of the contractor, shall communicate all aspects of the EMP to the site staff (i.e. site agents to labourers) prior to commencement of excavation or any other environmentally disturbing activity. Basic environmental awareness training must be carried out for all employees (it is suggested that this be conducted in a language best understood by all employees) and should be included in safety training.

A copy of the EMP must always be made available on site. General waste such as food wrapping and sanitary waste shall be confined to the work site and collected daily for appropriate disposal at an approved municipal landfill. Construction waste such as rubble shall be gathered up for disposal at an approved location. No waste is to be burned or disposed of on-site and construction personnel are required to confine their activities within the approved work site. It should be emphasized that the Environmental Practitioner shall be given the responsibility to inventory all the environmental aspects of the operation. Such responsibilities are to include the following:

- Documentation of specific environment-related activities, such as lists of fuel spill incidents.
- Ensuring that project related activities comply with contingency plans, regulatory permits and approval conditions, as well as contract provision or specifications.
- Providing environmental information for staff and ensuring that all personnel and contractors understand the terms and conditions outlined in all regulatory permits and in the Management Programme report.
- Maintaining the required records for environmental monitoring programs.
- Maintaining a photographic record of prior to, and during construction activities that have the potential to affect environmental resources in an adverse manner.

10. ENVIRONMENTAL AWARENESS PLAN

Environmental Awareness Plan describing the way the Contractor intends informing its employees of any environmental risks which may result from their work and the way the risk must be dealt with to avoid pollution or degradation of the environment. All internal staff and external Agents undertaking work on the proposed development must undergo Environmental Inductions and Training which must include the contents of the Final EMP. During the construction phase, regular Health and Safety Toolbox Talks must be held to address potential environmental risks, near misses or incidents and how they can be avoided in future. Regular drills are to be held to ensure that all staff are aware of the spill contingency and other environmental emergency procedures as applicable and can perform these procedures in reasonable timeframes.

11. CONCLUSION

The EMPr is to be implemented between all parties involved in this development. This EMPr must be used as a tool to support the development in being sustainable in environmental terms while still promoting economic and social development. It contributes to the environmental awareness of the workforce and can also facilitate the prevention of environmental degradation and minimise impacts when they are unavoidable. It also describes the methods and procedures for mitigating potential impacts and monitoring thereof.

12. REFERENCES

1. Environmental Conservation Act of 1989 (Act No; 73 of 1989) Republic of South Africa, Pretoria Department of Environmental Affairs and Tourism (1998).
2. EIA Regulations-Implementation of Section 21, 22 and 26 of the Environment Conservation Act, Government Printer, Pretoria.
3. National Environmental Management Act of 1998 (Act No; 107 of 1998).
4. Regulation in terms of Chapter 5 of the National Environmental Management Act, 1998 (21 April 2005) Department of Environmental affairs and Tourism.
5. Occupational Health and Safety Act (OHSA) (Act No. 85 of 1993)

ANNEXURE A

Environmental Code of Conduct

The applicant is committed to ensuring that the operation of the development is done according to the highest environmental standards so that the ecological footprint of the development is minimised where possible.

The applicant requires that all personnel involved in the operation process accept their responsibilities towards the EMP and the environment. This includes all permanent, contract or temporary workers as well as any other person involved with the project or visiting the site. Ignorance, negligence, recklessness or a general lack of commitment will not be tolerated.

If you do not understand the rules you must seek assistance to ensure compliance. The following people can assist you in ensuring compliance with the EMP.

Your Supervisor:

Environmental Control Officer:

Project Manager:.....

