

**THE PROPOSED DEVELOPMENT OF MATHULINI RDP
HOUSING PROJECT WITHIN WARD 5, UMSHWATHI
MUNICIPALITY**
EDTEA REF: DC22/0002/2019

**DRAFT ENVIRONMENTAL MANAGEMENT PROGRAM
REPORT**

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1. INTRODUCTION

1.1 Project Description

The development proposal entails the insitu construction of 971 RDP houses across ward 5 in Umshwati Municipality. The project is based on the old Department of Human Settlements rural housing subsidy Quantum and Department of Human Settlements is the funding agent.

Majority of the new houses will be constructed within the existing properties (yards) of beneficiaries, adjacent to their informal houses. There is, however, a possibility that a few of the existing properties are too proximal to watercourses and therefore cannot be built within the existing plots. Hence, subject to beneficiary consent, the new homes will be located further away from watercourses (drainage channels). There will also be several new houses constructed within newly allocated plots at the time of construction.

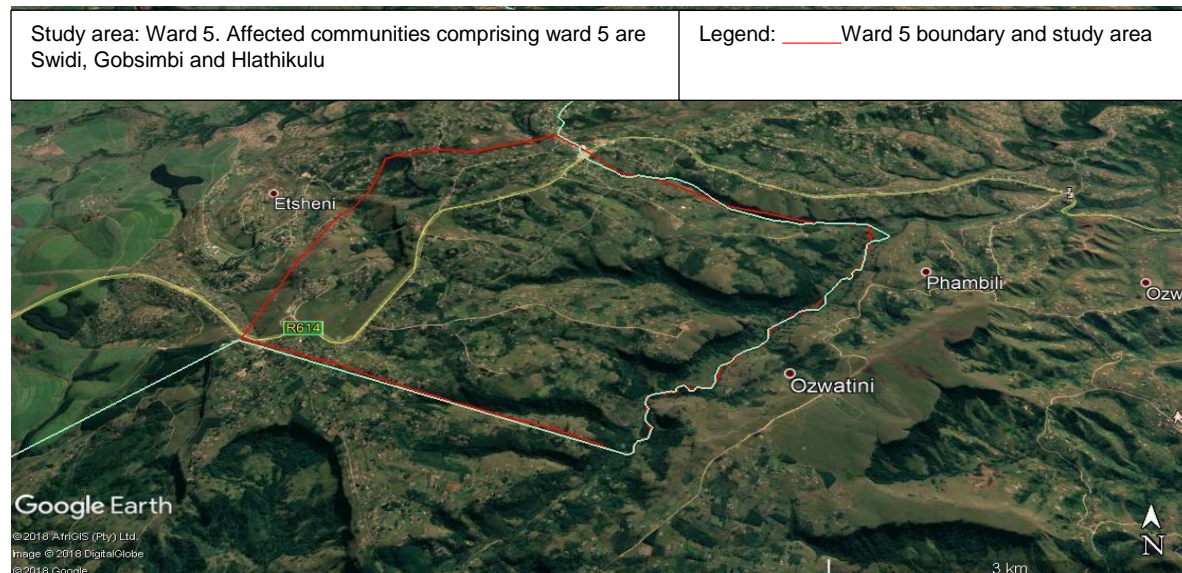
The beneficiary properties will also include a ventilated improved pit latrine (VIP) sanitation system; VIPs are available at most of the existing households and consequently all approved beneficiaries who have previously received this type of toilet (through any Umgungundlovu District Municipality projects) will not receive a second VIP.

Each house (including temporary development footprint and VIP) is not expected to exceed 80 square meters. Each house itself will be a single storey, 40.22m² structure, with a kitchen, two bedrooms and living area. The layout allows for the provision of services and infrastructure in future.

Note that the Umgungundlovu District is the water and sanitation services authority, however the construction of VIPs has now been included in this application to avoid possible delays further along the project.

No services or infrastructure will be constructed for this phase of the project. A separate EIA for infrastructure and services (roads, water, electricity etc) will be conducted by relevant service authorities when required.

Co-ordinates-center point of study area: 29 23 25.01 S; 30 52 41.0 E, area as shown in figure 1 below:



1.2 Description of Affected Environment and Summary of Specialist Studies

Description of Socio-economic Environment

The uMshwathi Local Municipality is located within the uMgungundlovu District Municipal area, to the north of Msunduzi Municipality. Covering a land area of approximately 1811 km², the uMshwathi Municipality has 106 374 people living in approximately 23 732 households according to Census 2011.

Sugarcane and timber plantations employ most of the people that are working. Livestock farms and to a lesser extent provide employment to a sizeable number of people. However, there are increasing numbers of people that get employment from the retail shops, taxi business sector and manufacturing

The agricultural sector contributes 41.5% to the local GDP (Statistics SA 2011). Sugarcane and timber plantations contribute the most to this GDP. Chicken houses are playing an ever-increasing role as well.

The main focal point for tourism in uMshwathi is in the Albert Falls Dam, Nagle Dam and the few private game reserves. Its contribution towards the local GDP is minimal although there is great potential for growth.

Most forestry plantations in uMshwathi are owned by MONDI and SAPPI. This sector is one of the biggest contributors to the local GDP and employment.

The population group across ward 5 as per Statistics SA shows that Black has the largest number of people (111102), followed by Coloured (21), Indian (15), White (13) and other (6) respectively.

The unemployment rate is 24.9% and youth unemployment rate is 31.5%. 30% (majority) of the total population earns around 19600 per annum with higher incomes declining sharply.

As per IDP, 3.2% have no schooling, 44.4% have some primary, 6.7% have completed primary, 32.6% have some secondary, 1.6% have completed secondary and only 0.9 have higher education.

The R614 provides important linkage to service nodal points and communities within the municipality as well as other communities outside this municipality while connecting with neighboring municipalities

With reference to the IDP, the Municipality indicated a backlog in the provision of housing and has identified a dire need for the provision of Subsidized Rural and also Rental Housing to meet the current demand for houses in various Wards with the Municipality, including Ward 5 wherein the project is located. A recent house-to-house survey that was conducted by uMshwathi Municipality recorded a housing backlog of 12 331 units. Ward 5 is described as a tertiary node requiring housing interventions.

Description of Heritage and Cultural Environment

The Phase I Archaeological and Cultural Heritage Impact Assessment for the proposed Mathulini housing development has identified no significant impacts to archaeological resources. Having noted that, archaeological sites dating to the Stone, Iron and Historical Age as well as battle fields are known to occur in the region of study. Below are the sensitive areas that were noted during survey:

-Most of the households which are within the proposed have family graves, the developers should thus avoid impacting on these sites; and

-Iron Age people preferred to settle on the alluvial soils close to rivers. The proposed area also includes tributaries. River banks irrespective of extent are viewed to be sensitive and should be cautioned in the best way possible.

-It is recommended that an archaeologist is assigned during bush clearing to further assess the area. -Although no significant archaeological materials were identified on the exact area proposed for development, the developer is reminded that unavailability of archaeological materials (e.g., pottery, stone tools, remnants of stone-walling, graves, etc) and fossils does not mean absentee, archaeological material might be hidden underground, and as such the client is reminded to take precautions during construction.

-Prior to construction, contractors should be given training on how to identify and protect archaeological remains that may be discovered during the project. The pre-construction training should include some limited site recognition training for the types of archaeological sites that may occur in the construction areas. Some of the indicators of archaeological site that may be found during construction are: Flaked stone tools, bone tools and loose pieces of flaked stone; Ash and charcoal; Bones and shell fragments; Artefacts (e.g., beads or hearths); Packed stones which might be uncounted underground and might indicate a grave or collapse stone walling.

-All construction within a radius of at least 10m of such indicator should cease and the area be demarcated by a danger tape. Accordingly, a professional archaeologist or Amafa officer should be contacted immediately. In the meantime, it is the responsibility of the Environmental officer and the contractor to protect the site from publicity (i.e., media) until a mutual agreement is reached. It is mandatory to report any incident of human remains encountered to the South African Police Services, Amafa staff member and professional archaeologist. Noteworthy that any measures to cover up the suspected archaeological material or to collect any resources is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement by Amafa or a professional archaeologist.

A thorough background study and survey of the proposed development was conducted and findings were recorded in line with Amafa guidelines. As per the recommendations above, there are no major heritage reasons why the proposed development could not be allowed to proceed. Thus, it is recommended that the proposed development proceed on condition that the recommendation indicated above are adhered to.

Description of Palaeontological environment

The area in which the study site is located is dominated by rocks of the Natal Group. These are considered to have a Moderate Palaeontological Sensitivity (SAHRA, 2019). A limited area adjacent to the north-western border of the study area where igneous rocks (granites and gneisses) of the Natal Structural and Metamorphic Province occur is of no palaeontological importance.

So far no fossils have been reported from the Ordovician-Silurian aged Natal Group (Groenewald, 2012).

Description of Biophysical Environment:

The area is characterised by a rainy summer season and experiences some rain in winter. Rain events can either be soft and soaking or dramatic thunderstorm events. The area has a mean annual rainfall of 895 millimetres (mm). Frost is infrequent, occurring mainly where cold air becomes trapped in valleys. The mean monthly maximum and minimum temperature for New Hanover in January (Summer) is 38.2°C and -0.2°C in June (Winter) (Mucina & Rutherford, 2006).

Based on a recent national assessment, wetlands and riverine ecosystems identified outside the project area are not considered to be important FEPA wetland sites however, and their respective catchments are also not regarded as important FEPA catchments according to the NFEPA (National Freshwater Ecosystems Priority Areas) coverage (CSIR, 2011).

No wetlands were identified within the project area but were identified with 5km away from the project. Field work was done within the area by soil sampling to check any signs of wetlands and nothing was found. This was also confirmed by the KZN Ezemvelo Wetlands Mapping.

According to Mucina and Rutherford (2006), the vegetation cover in the area is classified as Ngongoni Veld. In terms of conservation status, Ngongoni Veld is classified as vulnerable and holds a conservation target of 25%.

In terms of terrestrial conservation priorities highlighted in the Terrestrial Systematic Conservation Plan for the Province (EKZNW, 2010), the site reflects “no status” in terms of conservation priorities except the Ngongoni veld which is vulnerable and has conservation status of 25%. The site is highly transformed with no biodiversity value but with alien plant transformation. As such, remaining natural habitat is unlikely to provide meaningful habitat for locally important biota.

The present condition of terrestrial vegetation and habitat is considered Very Low due to the level of transformation, disturbance and alien infestation that now characterises the site. Habitat connectivity is also considered to be very low as a result of the location of housing plots across much of the site and the alien infested thornveld that has replaced natural grassland vegetation and can be considered to have a low conservation status/significance. It is highly unlikely that any fauna of conservation concern would actively utilise this habitat due to the poor condition, low connectivity, high risk of predation by domestic animals (dogs) and general level of human disturbance at the site. Any faunal species that do occur are likely to be locally common, generalist species that are resilient to environmental stress. As a result, the ecological importance of the site can be considered Very Low in terms of vegetation status and potential habitat value.

The proposed housing development is unlikely to result in potential negative impacts to aquatic and terrestrial habitat as there was no wetland identified on site and the site has been degraded.

As a direct result of transformation and use (e.g. housing), the present condition of aquatic and terrestrial habitat is considered poor to very poor (largely disturbed with high levels of alien plants) with a low ecological importance & sensitivity (EIS).

Recommendations below are to be considered during construction:

- No activities are to infringe upon sensitive areas such as man-made wetlands
- An invasive alien control program must be implemented to eradicate the existing alien invasive plants/trees and to prevent the introduction and spread of these species as per the legislative requirements.
- Loss of indigenous tree species must be kept to a minimum and must be replanted after construction.

-Disturbed areas must be rehabilitated immediately after construction has been completed in that area by planting appropriate indigenous plant species to reinstate floral ecology

-Rehabilitated areas must be monitored to ensure the establishment of revegetated areas and to ensure adequate ground cover.

-If possible, the development footprint should avoid destroying the protected indigenous plants and if this is unavoidable must be relocated.

-If they are required to be removed, they should be transplanted elsewhere on site so that they may re-establish.

Geology and Soils

According to the 2930 Durban, 1:250 000 Geological Map Series, the general area within which the site is located is underlain by largely by Natal Group Sandstone and to a lesser extent by granite and gneiss bedrocks of the of the Mapumulo Metamorphic Suite.

The project area is characterised by a variable topography. In areas of steep slopes necessary precautions must be exercised. It is therefore likely that platforms will need to be excavated in order to provide level areas for construction of the structures.

Cuts and fill slopes exceeding 2.0m in height will require special consideration.

Overall, the site is considered suitable for the intended development provided that the recommendations are adhered to.

The evaluation of the foundation soils and subsequent classification of the site into foundation classes has been carried along the guidelines as proposed by Watermayer and Tromp (1992) and the Structural Division of the SAICE as prescribed by the NHBRC.

-Based on the geology and the rock/soil profiles encountered during investigation; site classes C/R, C1 and S/R and S1, associated with normal and modified normal founding conditions are considered suitable for the project area.

-Earthworks must be carried out according to SANS 1200D. In areas of gentle to moderate slopes, it is anticipated that cuts and fills will be minimal. However, areas with steep slopes will necessitate extensive cut and fill for building platforms. Where required, cut and fill slopes must be constructed to batters not steeper than 1 vertical to 1.5 horizontal, unless retained. Erosion protection of the slopes must also be implemented by the establishment of vegetation and drainage measures to divert runoff away.

-All fill should be placed in layers of not more than 150mm loose thickness and compacted to at least 93% Modified AASHTO maximum dry density at (OMC). Boulders greater than $\frac{2}{3}$ of the compacted layer in thickness to be removed due to the difficulty of compacting the soil in between or around the boulders.

-Fill placed on the downslope of building platforms will generally consist of soils which have been removed from the cut portions of the terraces. These materials should be adequately stabilised with vegetation. Both during and after construction, the site should be well graded to permit water to drain readily away and to prevent ponding of water anywhere on the ground surface.

-Furthermore terrace surfaces should be sloped at 1:1 1/2 to allow for free drainage. Cut and fill slopes should be topsoiled and planted with grass to limit erosion and problems associated with wash-aways of fill embankments.

-A most important factor in the promotion of a stable site is the control and removal of both surface and groundwater from the site. Such water should be directed towards the natural surface drainage lines. Disposal of stormwater should conform to the Local Authority's requirements.

-Surface drainage of building platforms should be designed to direct water away from fill edges to prevent overtopping of the fill crest and erosion of the fill embankment slopes.

-It is important that grassing of fill embankments be carried out as soon as possible after construction.

-During the detailed geotechnical investigation the insitu material across the site will be sampled and tested for suitability for use in the construction phase. Should the material not be suitable then material may have to be imported from a suitable commercial source.

-Excavation conditions over much of the site should categorise as 'soft mechanical excavation' according to SANS 1200D "Classification of material for machine excavation" to an average depth of about 1.0 metres below ground level.

-'Intermediate to hard mechanical excavation' may be expected with depth, particularly on weathered bedrocks.

The proposed development is believed to comprise of the construction of low-cost units across the site. The site is considered suitable for the proposed upgrade. However, a detailed site investigation is required.

2. PURPOSE AND OBJECTIVES OF ENVIRONMENTAL MANAGEMENT PROGRAM

The objective of the EMPr is to manage the predicted impacts identified during the Environmental Impact Assessment (EIA) process, as well as during construction. This is a dynamic document and may be continuously updated to reflect current site conditions and address any additional issues that may arise during construction. The EMPr therefore serves as an action plan for the implementation of mitigation measures proposed during the EIA process to ensure that environmental impacts during construction are not significant.

The purpose of the EMPr is to:

- To provide a clear indication of the environmental management requirements of each of the role players involved
- Outline the Contractors' environmental management commitments for the project construction;
- Ensure adherence to relevant environmental legislation;
- Act as a performance standard that construction activities can be audited against.
- To set out the environmental management or mitigation measures which are required to be implemented during various phases of the project, to minimize the extent and severity of environmental impacts
- To provide management objectives and measurable targets as well as timeframes and budget requirements

The EMPr provides mitigation and management measures for the following phases of the project

➤ Planning Phase

This section of the EMPr incorporates pro-active environmental management measures with the goal of attaining sustainable development which can be achieved during this phase. Pro-active environmental measures help minimize the chance of negative impacts occurring. Necessary corrective actions in terms of design or location are proposed to further limit potential impacts.

➤ Construction phase

This section of the EMPr provides management principles for the construction phase of the project. Environmental actions, procedures and responsibilities as required within the construction phase are specified. This specification will form part of the contract documentation and, therefore, the contractor will be required to comply with the specifications in terms of the construction contract.

Rehabilitation/Reinstatement of sites is included under the construction phase (Post Construction).

➤ Operation and maintenance phase

This section provides management for the operational and maintenance phase of the structure/activity. Environmental actions, procedures and responsibilities as required within these phases are specified. Through taking pro-active measures during the design and planning phases as well as the construction phase; potential environmental impacts originating during the operational phase can be minimized or even prevented. The operational phase is not considered for this project.

➤ Decommissioning phase

Decommissioning takes place once the structures/activity no longer serving the purpose for which it was constructed, or if it may have deteriorated over the duration of its operation. Note that the decommissioning phase is not considered for this activity, due to the design life of the homes, and future upgrades to the homes in the distant future ensuring a considerably long lifespan of the homes,

3. ROLES AND RESPONSIBILITIES

The successful implementation of the EMPr requires co-operation between the Applicant, the appointed Contractor, the Engineer (Project Manager) and the Environmental Control Officer (ECO). The ECO is appointed to monitor the implementation of the specified mitigation measures contained in the EMPr/EA and report on findings to all parties. While the Contractor will be required to comply with all the conditions contained within the EMPr, it must be noted that Applicant is the legal entity responsible for ensuring compliance with the Environmental Authorization (EA) and is responsible for compliance with the provisions for duty of care and remediation of damage contained in section 28 of the National Environmental Management Act, No. 107 of 1998 (NEMA).

The specific responsibilities of the respective parties are outlined below:

3.1 The Applicant:

Umshwathi Local Municipality, as the Applicant, remains ultimately responsible for ensuring that the project or activity is implemented according to the requirements of the EMPr and EA, even though other role players will be appointed to undertake specific tasks. Note that uMgungundlovu District Municipality, as the provider for sanitation services, will also be bound to this EMPr.

The Applicant shall:

- Appoint an independent Environmental Control Officer
- Ensure sufficient funds are available for environmental management
- Including the EMPr or a blanket item for environmental management and rehabilitation in the contract document
- Prevent negative impacts on the environment by enforcing compliance of the EMPr (compelling the contractor to comply with the EMPr)
- Maintain all approved structures to effectively fulfil its intended purpose and to prevent negative environmental and future safety impacts
- Ensure that suitable arrangements be made to protect the environment (site) against long term negative impacts
- Ensure rehabilitation and maintenance of all disturbed areas
- Can issue a directive for compliance to the contractor, and can steps to recover costs for compliance and rehabilitation of environmental damage

3.2 Engineer (Project Manager)

- Ensure that the specification for the work takes into consideration the location and existing environmental conditions at the site; and all facets of environmental protection are properly addressed in the specification for the work;
- Ensure that the Contractor meets all his specific contractual responsibilities, adheres to environmental and occupational health and safety standards, and complies with the EMPr;
- Assist the ECO in enforcing compliance.
- Ensures that the contractor complies with the EA, EMPr and specialist studies through enforcement and site instructions

3.3 The Contractor

- Ensures adherence to conditions of authorization (including the EMPr and specialist studies) and any other laws and standards relevant to the activity at all times;
- Implements and complies with the conditions of the EA, EMPr and Specialist studies on site on a daily basis;
- Takes instruction from the Applicant, Engineer, ECO
- Avoid and/or limit any adverse impacts on the environment
- Prevents environmental pollution and degradation on site
- Ensure suitably qualified personnel are available for overseeing environmental management

- Ensure sufficient funds have been set aside for environmental management, rehabilitation/reinstatement
- Ensure the construction activities comply with the EMPr.
- Responsible under S28 NEMA (Duty of Care)

Contractors must sign the declaration of understanding and acceptance of EMPr, annexure A, which will be forwarded to EDTEA by the ECO.

3.3.1 Environmental Officer

- The Environmental Officer (EO) is appointed internally by the Contractor (is an employee or agent of the contractor).
- This EO must be similarly qualified as the ECO (have a degree in environmental management, science, or geography)
- The EO is responsible for supervising daily environmental performance on site, ensuring corrective actions are taken and preventative measures are put in place as specified in the EA and EMP as well as recording compliance on a daily basis
- The EO must maintain a record of non-compliances and compliances, incidents, and complaints on site via a consolidated weekly audit report which must be sent to the ECO, and which must be filed in the environmental file
- Provide environmental induction on site for each new team/person

3.4 The Environmental Control Officer

- Undertake site auditing and monitoring during construction, against the conditions of the authorized EMPr, and EA (including specialist studies)
- Provide an audit report on environmental compliance for DEDTEA, applicant and contractor
- Undertake awareness training for staff
- The ECO may occasionally undertake audits unannounced and unaccompanied
- The ECO may, upon request from the Contractor and Applicant, assist in procuring specialists to undertake permit applications, (but cannot not be held liable for any delays).

4. MONITORING, COMMUNICATION AND REPORTING

4.1 Responsibilities for Environmental Management

The Applicant, Contractor and its agents will be responsible for environmental management on site during the construction period. A pre-construction meeting is recommended to reach agreement on specific roles of the various parties and penalties for non-compliances with the EMPr.

4.2 Complaints Register and Environmental Incident Book

Any complaints received from the community must be registered and recorded by the Contractor on site. The complaint must be brought to the attention of the site manager and Contractor, who will respond accordingly. The following information must be recorded:

- Time, date and nature of the complaint;
- Response and investigation undertaken; and
- Actions taken, by whom, and closure

All complaints received must be investigated and a response (even if pending further investigation) is to be given to the complainant within 7 days. Records of proceedings are to be maintained in the environmental file and these must be made available to the ECO and Authorities on request.

4.3 Incidents

The Contractor will report to the Engineer and ECO, within 1 day, the occurrence or detection of any major incident at the site, or incidental to the operation of the site which has the potential to cause, or has caused, water pollution, damage to the environment, health risks or serious nuisance conditions, or which is a contravention of the Environmental Management Program or any related law. Within a maximum of 2 days from the occurrence or detection of any major incident, an action plan must be submitted with a detailed time schedule for implementation,

- To correct the impacts of the incident,
- To prevent the incident from causing any further impacts and
- To prevent the recurrence of a similar incident.

The non-compliance and complaints register, together with actions taken or to be taken, are to be kept on file by the EO and made available to the ECO and Authorities (and other external site auditors).

4.4 Site Instruction Entries

The Engineers site instruction book entries will be used for the recording of general site instructions as they relate to the works. It will also be used by the Engineer for the issuing of stop work orders for the purposes of immediately halting any particular activities of the contractor in lieu of the environmental risk that they may pose and any non-compliance with the EMP.

4.5 EO Diary Entries

The purpose of these entries will be to record the comments of the EO as they relate to activities on the site. Each of these books must be available in duplicate, with copies for the project manager and ECO. These books should be available to the authorities for inspection or on request. Minutes of all the meetings that reflect environmental queries, agreed actions and dates of eventual compliance must be available and form part of the official environmental record.

4.6 Method Statements

Method statements (from the Contractor) will be required for specific actions within sensitive areas on request of the Authorities or ECO. A method statement forms the base line information in which work takes place and is a “live document”, modifications are negotiated between the Engineer and ECO as circumstances unfold. A method statement should clearly indicate the following at a minimum:

What - a brief description of the work to be undertaken;

How - a detailed description of the process of work, methods and materials;

Where - a description/sketch map of the locality of work (if applicable); and

When - the sequencing of actions with commencement dates and completion date estimates.

The contractor must submit the method statement at least 14 days before any construction activity is due to start. Work may not commence until the method statement has been approved by the ECO and Engineer.

4.7 Record Keeping

The Contractor shall ensure that all records related to the implementation of this management plan (e.g. complaints register and incident book, site instruction book; EO diary; method statements) are kept together in an environmental file, in an office where it is safe and can be retrieved easily. These records should be available for scrutiny by the ECO and any relevant authorities at any time.

4.8 Photographs

The Contractor must ensure that photographs are taken of the site prior to, during and immediately after construction as a visual reference. These photographs should be stored with other records related to this EMPr. If captured in digital format, hard copies must be kept with all other records relevant to the implementation of this EMPr.

4.9 Environmental Close Out Report or Completion Statement

An environmental close out report or completion statement is a report by the ECO to the relevant authorities stating completion of the project and compliance with the EMPr and conditions of authorization.

4.10 Basic Rules of Conduct and environmental management practices

The following list represents the dos and don'ts towards environmental awareness that all participants in this project must consider whilst carrying out their tasks. These are not exhaustive and serve as a quick reference aid.

DO:

- Use the toilet facilities provided – report dirty or full facilities
- Clear your work areas from litter and building rubbish at the end of each working day – use the waste bins provided and ensure that the litter will not be wind blown
- Report all fuel or oil spills immediately and stop and / or contain the spillage
- Dispose of cigarettes and matches carefully
- Confine work and storage of equipment to within the immediate work area
- Use all safety equipment and comply with all safety procedures
- Ensure a working fire extinguisher is immediately at hand if any 'Hot Work' is undertaken e.g. welding, grinding, gas cutting etc.
- Prevent excessive dust and noise

DO NOT:

- Make any uncontained fires
- Enter any fenced-off or marked area
- Allow cement powder or cement bags to be wind blown

- Dump waste, litter, oils or foreign materials into drainage lines or waterbodies
- Litter or leave food strewn around

4.11 Environmental Monitoring, Reporting Mechanism

Environmental monitoring will be undertaken by the ECO on the frequency as stipulated in the EA. Monitoring will be undertaken to ensure compliance with all aspects of the EMPr.

Measurement and Payment

It is suggested that a generous lump sum be made available for all environmental management requirements and rehabilitation. Underbudgeting or lack of funds will not be accepted as a reason for poor environmental management or lack of management facilities on site.

4.12 Communications

In order to facilitate communication between the ECO, Engineer (project manager) and Contractor, it is important for a line of communication to be established that will ensure that the ECO's recommendations have the full backing of the project team before being conveyed to the Contractor. In this way, penalties as a result of non-compliances with the EMPr may be justified as failure to comply with instruction from the highest authority.

All communication should be via the Engineer, unless otherwise agreed upon by all parties.

5. LEGAL REQUIREMENTS

Various legislation and guidelines must be adhered to. Please note that this list is not exhaustive. All relevant parties must ensure that they are familiar with the content.

- The National Environmental Management Act (Act No. 107 of 1998);
- EIA Regulations, 2014
- National Forests Act (Act No.84 of 1998)
- The Environment Conservation Act (Act No.73 of 1989);
- The National Water Act (Act No. 36 of 1998);
- Occupational Health and Safety Act (Act No.85 of 1993);
- Hazardous Substance Act (Act No.15 of 1973);
- Environmental Management: Air Quality Management Act (Act No. 39 of 2004);

- The Constitution of the Republic of South Africa (Act No. 108 of 1996);
- Disaster Management Act (Act No. 57 of 2002);
- National Heritage Act (Act No. 25 of 1999);
- The KwaZulu-Natal Heritage Act (Act No. 10 of 1997)

6. COMPLIANCE REQUIREMENTS

The contractor is required to comply with the conditions of the EA and the requirements of the EMP. Difficulties may be encountered with carrying out mitigation measures that could result in future non-compliance. The Contractor shall put in place procedures to motivate staff members to comply with the EMP, and to deal with acts of non-compliance, or malicious damage to the environment. Penalties for non-compliance need to be discussed with the Contractor at the earliest stage (during the Pre-Construction Meeting). The Contractor is deemed not to have complied with the Environmental Management Plan if:

- Within the boundaries of the site, site extensions and haul/access roads there is evidence of contravention of clauses;
- If environmental damage ensues due to negligence;
- The Contractor fails to comply with corrective or other instructions issued by the Project Manager or Engineer within a specified time;
- The Contractor fails to respond adequately to complaints from the public.
- Application of a penalty clause will apply for incidents of non-compliance. The penalty imposed will be per incident. Penalties imposed per incident or violation will be as per table below.

Table: Penalties

Type of Non-Compliance	Fine
Failure to demarcate working area	R30000
Working outside of the demarcated area	R30000
Failure to strip topsoil with intact vegetation	R20000
Failure to stockpile and maintain topsoil correctly	R50000
Failure to store materials/effects correctly/in designated areas	R50000
Failure to prevent and remedy erosion	R20000
Failure to provide adequate sanitation	R10000
Unauthorized removal of vegetation	R50000
Failure to provide and use drip trays and spill kits	R50000

Failure to provide adequate, separate waste disposal facilities and services	R30000
Failure to reinstate disturbed areas within the specified time-frame	R50000
Failure to rehabilitate disturbed areas within the specified time-frame	R50000
Failure to prevent and/clean hydrocarbon/chemical spills	R50000

7. ENVIRONMENTAL AWARENESS TRAINING OF EMPLOYEES

The Contractor and Environmental Control Officer (ECO) shall ensure that adequate environmental awareness training of site personnel takes place and that all construction workers receive an induction presentation on the importance and implications of the contents of the EA and EMPr. The presentation shall be conducted, as far as is possible, in the employees' language of choice. A register will be held of all staff trained by the ECO.

Thereafter, the Contractor shall conduct weekly toolbox talks on the contents of the EMPr and EA. The contractor shall keep records of all environmental training sessions, including names, dates and the information presented.

As a minimum, training should include:

- Explanation of the importance of complying with the EA and EMPr.
- Employees' roles and responsibilities in terms of onsite environmental management, including emergency preparedness and specialist requirements
- Explanation of the mitigation measures
- Contents of the EMPr and EA
- Penalties and implications for not complying

8. ENVIRONMENTAL MANAGEMENT IMPLEMENTATION PROGRAMME

Environmental management measures are to be implemented during the construction program. Mitigation/management measures are either to be implemented immediately or prior to an aspect of work commencing, and in the event of an incident/non-compliance.

It is also recommended that a lump sum be allocated for environmental management.

The Monitoring and Reporting Mechanism will be via site visits at the DEDTEA stipulated frequency followed by a written report on findings which will be distributed to all parties.

8.1 Objectives

The management of the project aims to achieve the following:

- Effectively minimize, reduce or eliminate negative impacts.
- Enhance the positive impacts of the project.
- Provide proper stakeholder engagement.
- Provide a healthy and sustainable environment post construction, via rehabilitation
- Protect the natural open spaces to ensure its continued function of providing habitat to fauna and flora species.

8.2 Management actions

Management actions must be feasible, practical and cost-effective ways to achieve the objectives. This can be achieved by:

- Avoidance: Avoiding activities that could result in adverse impacts; avoiding certain types of resources or areas considered to be environmentally sensitive.
- Prevention: Measures aimed at preventing the occurrence of negative environmental impacts and/or preventing such an occurrence having harmful environmental and social impacts.
- Preservation: Preventing any future actions that might adversely affect an environmental resource. This is typically achieved by extending legal protection to selected resources beyond the immediate needs of the project.
- Minimization: Limiting or reducing the degree, extent, magnitude or duration of adverse impacts. This can be achieved by scaling down, relocating, or redesigning elements of a project.
- Rehabilitation and restoration: Repairing or enhancing affected resources to their preconstruction state, or to an improved state, which precludes erosion and alien invasive species.

8.3 Measurable targets

Measurable targets for environmental management will be the following:

- Proper design considerations
- No signs of erosion; implementation of erosion control measures and subsequent rehab
- No pollution of any nature evident at the sites
- No contaminant spills; or evidence of such spills being cleaned promptly
- No improper waste disposal noted; presence of waste management facilities
- No injury to fauna
- Not indiscriminate clearing of vegetation
- Required permits are in place
- No damage to heritage, cultural and paleontological resources
- No social complaints or injuries; or complaints closed out successfully within specified time frames as per complaints register
- No residual effects which may lead to degradation after construction

Environmental incidents must be recorded in the environmental register and must indicate close out actions, success, dates and personnel involved.

All the proposed management actions are included in this EMPr.

Timeframe for implementation of corrective actions and mitigation

In general, negative findings must be rectified as per item 4.3, or within 48 hours, or as agreed to by the ECO and Engineer.

9. ENVIRONMENTAL MANAGEMENT MEASURES

The section below outlines the environmental impacts associated with this activity (project), as well as management and mitigation measures that may be implemented to better manage the effects imposed on the environment by this project.

Activity/Impact/Aspect	Mitigation/Management	Responsibility	Frequency or Timing
PRE-CONSTRUCTION PHASE			
1. Legislation and permits	<ul style="list-style-type: none"> - A copy of the EMPr and Environmental Authorization, must be distributed to all parties and kept on site during construction. These documents must be made available to any authorized person or department, the ECO, employee or agent who undertakes work on the site. - Applicant must appoint an Environmental Control Officer (ECO) to provide compliance audits with the EMPr, specialist studies and Environmental Authorization. - Construction must commence after the Development Rights Agreements has been finalised by Ingonyama Trust Board. - The contractor is to ensure that all his material is sourced in a legal manner and must provide a source statement for materials used. Note that natural materials such as G5, G2, and sand, and essentially borrow pits, will possibly require a permit from DMR and the contractor is required to have this in place if he will be sourcing material directly himself, and must ensure that his suppliers or subcontractors are also compliant. - Should any protected tree or trees in a forest need to be disturbed, or relocated, a permit must 	Applicant / Engineer/ Contractor	Design/Planning/Prior to construction

	<p>first be obtained by the contractor from DAFF prior to such an action.</p> <ul style="list-style-type: none"> - Similarly, should any protected plant species need to be disturbed, or relocated, a permit must first be obtained by the contractor from EZKNW prior. The contractor may request assistance from the ECO in this regard. - The declaration of understanding and acceptance of EMPr, Annexure A, must be signed by the contractor and a copy must be provided to the ECO, who will then submit this to EDTEA. 		
<p>2. Method statements</p>	<p>The following Construction Method Statements are required:</p> <ul style="list-style-type: none"> - Camp Site layout. - Topsoil management - Waste Management - Vegetation and alien plant control, including clear and grub, topsoil management - Stormwater and runoff, including erosion control and repair - Hazardous Storage - Emergency preparedness and pollution control - Noise and dust management - The abovementioned Method Statements must include the names of staff that are responsible for the implementation of these plans. The responsible staff members must be adequately trained according to their allocated 	<p>Contractor</p>	<p>Prior to construction and ongoing</p>

	<p>responsibilities prior to construction commencing.</p> <ul style="list-style-type: none"> - Method statements must be approved by the Engineer and ECO as required. 		
CONSTRUCTION PHASE			
3. Environmental awareness training	<ul style="list-style-type: none"> - Awareness training must be undertaken by the ECO, based on the contents of the EMPr, EA and specialist studies. - The contractor is then required to conduct daily toolbox talks for staff based on the contents of the EMPr. - Training registers must be obtained and filed after each training. 	Contractor and ECO	Site establishment and ongoing as required
4. Geotechnical aspects	<ul style="list-style-type: none"> - In areas of steep slopes necessary precautions must be exercised. It is therefore likely that platforms will need to be excavated in order to provide level areas for construction of the structures. - Cuts and fill slopes exceeding 2.0m in height will require special consideration. - The evaluation of the foundation soils and subsequent classification of the site into foundation classes has been carried along the guidelines as proposed by Watermayer and Tromp (1992) and the Structural Division of the SAICE as prescribed by the NHBRC. Based on the geology and the rock/soil profiles encountered during investigation; site classes C/R, C1 and S/R and S1, associated with normal 	Engineer / Applicant / Contractor	Prior to and during construction

	<p>and modified normal founding conditions are considered suitable for the project area.</p> <ul style="list-style-type: none">- Earthworks must be carried out according to SANS 1200D. In areas of gentle to moderate slopes, it is anticipated that cuts and fills will be minimal. However, areas with steep slopes will necessitate extensive cut and fill for building platforms. Where required, cut and fill slopes must be constructed to batters not steeper than 1 vertical to 1.5 horizontal, unless retained. Erosion protection of the slopes must also be implemented by the establishment of vegetation and drainage measures to divert runoff away.- All fill should be placed in layers of not more than 150mm loose thickness and compacted to at least 93% Modified AASHTO maximum dry density at (OMC). Boulders greater than $\frac{2}{3}$ of the compacted layer in thickness to be removed due to the difficulty of compacting the soil in between or around the boulders.- Fill placed on the downslope of building platforms will generally consist of soils which have been removed from the cut portions of the terraces. These materials should be adequately stabilised with vegetation. Both during and after construction, the site should be well graded to permit water to drain readily away and to prevent ponding of water anywhere on the ground surface.- Furthermore terrace surfaces should be sloped at 1:1 1/2 to allow for free drainage. Cut and fill slopes should be topsoiled and planted with		
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	<p>grass to limit erosion and problems associated with wash-aways of fill embankments.</p> <ul style="list-style-type: none">- A most important factor in the promotion of a stable site is the control and removal of both surface and groundwater from the site. Such water should be directed towards the natural surface drainage lines. Disposal of stormwater should conform to the Local Authority's requirements.- Surface drainage of building platforms should be designed to direct water away from fill edges to prevent overtopping of the fill crest and erosion of the fill embankment slopes.- It is important that grassing of fill embankments be carried out as soon as possible after construction.- During the detailed geotechnical investigation the insitu material across the site will be sampled and tested for suitability for use in the construction phase. Should the material not be suitable then material may have to be imported from a suitable commercial source.- Excavation conditions over much of the site should categorise as 'soft mechanical excavation' according to SANS 1200D "Classification of material for machine excavation" to an average depth of about 1.0 metres below ground level.- 'Intermediate to hard mechanical excavation' may be expected with depth, particularly on weathered bedrocks.- A detailed site investigation is required.		
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<p>5. Site establishment / construction camp</p>	<ul style="list-style-type: none"> - The impending construction activities must be advertised via sign boards with relevant contact details, meetings and social facilitation, so that the community is aware in advance of contract commencement. - A site plan must be submitted to the ECO for approval. The construction camp must be positioned on a previously disturbed area or property, with limited cut and fill. This layout plan is to be submitted prior to site establishment for acceptance. Any changes to this plan require review by the Engineer in conjunction with the ECO. The Contractor will consider prevailing wind directions when designing the site layout to minimize impacts due to dust, as well as proximity to residents. - The camp must not be located within 32m from watercourses and the areas of sensitive vegetation. - The size of the camp must be minimized. - Topsoil (top 200-300mm of soil surface) from the construction camp must be stripped and conserved. - The camp site must be secured, equipped with signage and all relevant contact details. - Lighting must be set out to provide security but not create a nuisance. - Accommodation is generally not permitted on site, unless agreed to by the Engineer. - Before the contractor completely establishes on site, the following basic requirements must be fulfilled: 	<p>Contractor</p>	<p>Prior to, during site setup and ongoing</p>
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	<ul style="list-style-type: none"> - The community has been properly informed of impending construction activities and project signage must be displayed with contact details - Separate waste receptacles must be provided - Portable sanitation facilities must be provided - A spill kit and metal drip trays must be available - Site camp must be demarcated and fenced 		
<p>6. Habitat, Vegetation and fauna (Biodiversity)</p>	<ul style="list-style-type: none"> - The working areas and site extents must be demarcated, using a fence, demarcation tape, beacons, barriers or pegs; no undue construction outside of this area will be permitted. Camp site areas must be minimized and located outside of sensitive areas and fenced off. Minimize the amount of vegetative cover stripped for survey purposes. Permits are to be in place prior to disturbance or removal of protected trees and plants for survey and construction purposes. - New plots (outside of existing plots) must not encroach onto the sensitive terrestrial areas and must be located outside of these. All new plots must be approved by the ECO and Engineer. - No burning of vegetation or undue removal of vegetative cover is permitted. - Loss of indigenous tree species must be kept to a minimum and must be replanted after the construction. - If possible, the development footprint must avoid destroying the protected indigenous plants and if this is unavoidable must be relocated. 	Contractor/Engineer	Site establishment and ongoing during construction

	<ul style="list-style-type: none"> - If they are required to be removed, they must be transplanted elsewhere on site so that they may re-establish. - Disturbed areas must be rehabilitated immediately after construction has been completed in that area by planting appropriate indigenous plant species to reinstate floral ecology. - Rehabilitated areas must be monitored to ensure the establishment of revegetated areas and to ensure adequate ground cover. - An invasive alien control programme must be implemented to eradicate the existing alien invasive plants/trees and to prevent the introduction and spread of these species as per the legislative requirements specified under the Conservation of Agricultural Resources Act, 1983 amended in 2001 and the National Environmental Management: Biodiversity Act 2004 (Act No, 10 of 2004) - Topsoil must be stripped from all temporary and permanent work areas, to a depth of 200-300mm, and stockpiled to a maximum height of 2m in a designated area and conserved till rehabilitation. Topsoil is the top 200-300 mm of the upper natural soil surface and includes grass, roots and organic matter. - Ensure that stockpiles are stockpiled parallel to excavations/works, and that topsoil and subsoil are stored separately. - The hunting, capturing, killing or intentionally harming of fauna of any kind is prohibited. 		
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<p>7. Alien invasive species</p>	<ul style="list-style-type: none"> - Control and eradication of alien vegetation or weeds from site (including subsoil and topsoil stockpiles) and all affected areas is required throughout construction - Control and eradication methods must be employed on a weekly basis at the least or as soon as weeds or invasive are detected, and preferably before seeds have formed - Control and eradication methods used should ideally be manual, with care being taken not to disperse seeds during removal - Topsoil must be seeded or covered with hessian to prevent loss and suppress weed establishment 	<p>Contractor</p>	<p>From site establishment and ongoing construction during</p>
<p>8. Surface and Groundwater</p>	<ul style="list-style-type: none"> - Groundwater protocol must be undertaken for individual plots to determine that VIP latrines are suitable and assess the possibility of ground water pollution. - VIP toilets must be low flush and lined, dependent on soil conditions and Engineer discretion. These must be situated on the most upslope side when in proximity to drainage lines/watercourses. - Position toilets further than 50m from watercourses to mitigate impacts of onsite disposal on floodlines and watercourses. - If such distal location is not possible and construction is unavoidably required near floodline areas and where the water table is high, the pit cover slab must be raised around 300mm, or well above, ground level, at the discretion of the Engineer. The guidelines as per 'A protocol 	<p>Contractor / Engineer</p>	<p>From site establishment and ongoing construction during</p>

	<p>to manage the potential of groundwater contamination from on-site sanitation' by the Directorate of Geohydrology of the Department of Water Affairs & Forestry (1997), must be observed, as well all other guidelines e.g. SANS standards, as per the discretion of the Engineer.</p> <ul style="list-style-type: none"> - No activities are to infringe upon sensitive areas such as man-made wetlands. - Construction of housing must occur outside of floodlines and riparian areas, as far as possible. - No pollution must result from the construction. - Waste material, from the construction process, must not be allowed to be washed (or dumped) into the drainage channels/watercourses. - An oil spill kit is required on site and must be used. - All plant must be inspected for leaks prior to undertaking work near the drainage lines/watercourses. - Cement powder and other potential environmental pollutants must be mixed on an impermeable surface or receptacle with special provisions for runoff near drainage lines/watercourses. Ensure that all implements used in hazardous material handling are placed on the bund area, a drip tray or similar impermeable surface. - Ensure that metal drip trays are available for all machinery on site and must be used during parking, refuelling and decanting and during emergency breakdown situations. Warped drip 		
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	<p>trays or drip trays with openings at any end will not be accepted.</p> <ul style="list-style-type: none"> - All hazardous/chemical products to be dispensed from drums/receptacles will be done so with appropriate equipment and preferably not dispensed by tipping of the drum. - No machinery may be washed near the watercourses/drainage channels. - Servicing of machinery and vehicles must be done on an impermeable surface within camp site, and drip trays must be used. 		
<p>9. Erosion and sedimentation, Runoff, Stormwater and soil conservation</p>	<ul style="list-style-type: none"> - Storm water and runoff management needs to be undertaken during construction. - Where clearing is undertaken, control measures as directed by the Engineer, such as silt traps, sand bags, berms, haybales, hessian sheets, channelling of runoff onto dense vegetated areas and silt curtains, must be employed as relevant, to control surface runoff and reduce the risk of soil erosion and sedimentation. - The time that stripped areas are left open to exposure must be minimized wherever possible. Care must be taken to ensure that lead times are not excessive. - Retain as much groundcover as possible on site. Avoid clearing areas/plots not required immediately for construction and clear only those plot sizes required for construction of the homes. - Avoid unnecessary cut, fill and undermining. - Wind screening and storm water/runoff control must be undertaken to prevent soil loss from site. 	<p>Contractor / Engineer</p>	<p>From site establishment and ongoing during construction</p>

	<ul style="list-style-type: none"> - Topsoil stripped from the construction camp and rest of the site areas must be stockpiled away from any potential disturbances, and stormwater/runoff pathways, on the edge or base of slopes and near watercourses/drainage lines. - Topsoil must be seeded or covered with hessian to prevent loss and suppress weed establishment. - Store topsoil separately from subsoil/spoil. - Do not place materials or construction effects on topsoil, and do not drive on the topsoil. - Topsoil should be handled twice only, during stripping and stockpiling and during reinstatement. - Temporary cut off drains and berms will be required to capture runoff and promote infiltration in steeper areas, as directed by the Engineer. - Where surface runoff is concentrated, flow must be slowed by contouring as relevant - Earth, stone and construction material and rubble is to be properly stored and disposed of so as not to obstruct natural pathways over the sites. - De-watering water must be released onto vegetation or crop areas. - All disturbed areas not required for permanent construction which are showing signs of erosion must be immediately stabilized. - Each house will be lined by a concrete base on the outside, as well as having roofs fitted with gutters, to prevent erosion from roof runoff. 		
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	<ul style="list-style-type: none"> - Seeding of embankments and plots to limit erosion and promote stabilization must be undertaken where required. - Grassing (seeding) must occur immediately after each construction is complete. 		
<p>10. Sanitation</p>	<ul style="list-style-type: none"> - VIP toilets for beneficiary households must be constructed as per item 8. - Temporary, portable, serviceable, gender specific chemical toilets must be provided by a company approved by the Engineer and must be compliant with relevant standards. - Portable toilets must be positioned within the site camp, and at individual construction sites as required. - Portable toilets must be placed further than 32m from the watercourses, or unless agreed to by the ECO. - Portable toilets must not be placed within the sensitive terrestrial areas or edge of slopes and plateaus. - Toilets and sanitation systems must be serviced on a weekly basis. - Certificates for servicing of portable toilets must be available on site during construction for review by the ECO and DEDTEA. - The use of portable toilets must be strictly enforced, unless residents have permitted use of their private toilets. Where no existing toilet is available, a portable toilet must be provided at that housing construction site. 	Contractor	From site establishment and ongoing during construction

	<ul style="list-style-type: none"> - The use of temporary constructed pit latrines and long drop toilets is prohibited. - The use of the surrounding/natural environment for sanitation/ablution facilities is prohibited. 		
11. Waste management	<ul style="list-style-type: none"> - Waste receptacles (bins or skips, or sealable drums) are required on site for waste management. - These receptacles must be covered and secured from the elements and rodents. - Separate receptacles must be used for general waste, hazardous waste and recycling in the camp. These must be labelled according to waste type, and there must be no mixing of waste. - Littering must be prevented; litter must be collected at the end of each working day and deposited in the waste receptacles. - A litter collection program is required. All waste material that has scattered across the sites must be immediately removed and discarded in the receptacles. Waste receptacles must not be allowed to overflow and must be covered. - All rubble, concrete, steel, bricks and board offcuts must be recycled (re-used if possible), or stored on a designated area in the main camp site pending disposal. - Waste (general waste and including rubble,) must be removed from site on a weekly basis in a licenced waste disposal site authorised to accept that waste stream. Disposal slips/receipts are required from the licenced waste disposal 	Contractor	From site establishment and ongoing during construction

	<p>site, which must be filed and made available to the ECO and DEDTEA.</p> <p><u>Hazardous waste:</u></p> <ul style="list-style-type: none">- All hazardous substances, including hydrocarbons (fuels, oils, chemicals), herbicides, oily rags, empty cement bags and battery acid, shall be stored in suitable, separate, signed receptacles which can be properly closed and secured, on adequately paved, to prevent accidental contamination of the soil, surface and groundwater.- Alternatively, an impermeable liner may be placed beneath above-ground storage tanks. The integrity of the liner is to remain intact for the duration of the contract, until removal.- All storage areas are to be bunded and have a peripheral collection/outlet drain which can be sealed, with oil interceptors (if required). The bunded area is to be sufficiently large to contain a spillage equivalent to the volume of one and a half containers of the substances stored. A register shall be kept of all substances and be available for inspection at all times.- Contaminated water must not be allowed to enter into the natural drainage systems/watercourses.- Chemical waste must be stored in appropriate containers and disposed of at licensed hazardous waste disposal facilities. Spent absorbent material to be regarded as a hazardous waste. Empty chemical packaging associated with the storage of hazardous materials to be returned to supplier, if possible,		
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	<p>sent to a drum reconditioning company or disposed of as a hazardous waste as a last resort.</p> <ul style="list-style-type: none"> - Hazardous waste, including contaminated rubble and soil, must be disposed of at a licenced hazardous waste site. Once disposal of hazardous waste has occurred, receipts/waybills must be sourced from the waste disposal site and filed by the contractor, for review by the ECO and DEDTEA. - Transporting, handling or moving of hazardous waste/chemicals must be done carefully to avoid spillage. - Burning of waste of any nature, and burying of waste of any nature, is prohibited, as is dumping of waste in the watercourses, the sensitive terrestrial areas or 'back' areas. <p>- The Contractor is to provide a method statement for the dealing of accidents / spillages of hazardous materials. This statement must be handed to the Engineer and ECO.</p> <p>- The following basic steps for spill response must be undertaken or considered:</p> <ul style="list-style-type: none"> - Stop the source of the spill - Contain the spill - Report the spill to the Engineer immediately - Use spill absorbent and spill kit - Determine if there is any soil, groundwater or other environmental impact 		
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	<ul style="list-style-type: none"> - Additional remedial action must be taken if required by DWS, DEDTEA, Engineer or ECO - All significant spills must be reported to DWS and relevant departments including the ECO and Engineer. - In the event of a minor spillage, clean the affected area and remove all the contaminated soil at depth. Store the contaminated soil in designated receptacle and dispose of a registered hazardous landfill site. - Cement/concrete spills from construction activity near the watercourses must be removed immediately. - The incident (minor or significant) must be documented 		
<p>12. Access</p>	<ul style="list-style-type: none"> - Existing accesses must be used. - All roads for construction access must be planned and approved by the Engineer and ECO ahead of construction activities. - Implement required signage. - No new accesses are to be created for any purpose, unless agreed to by the Engineer and ECO prior. The Contractor will have to ascertain the existing condition of access roads and repair accordingly should damage occur due to construction and haulage activities. - Turning points will be marked out on the site for easy identification by contract workers. No turning other than at designated places shall be permitted. Parking areas for heavy vehicles will be determined and indicated. 	Contractor/Engineer	Prior to full site establishment and ongoing

	<ul style="list-style-type: none"> - Parking and turning areas must be located further than 32m from watercourses and sensitive terrestrial areas. 		
13. Noise	<ul style="list-style-type: none"> - Machinery and vehicles are to be kept in good working order for the duration of the project to minimize noise nuisance to residents and fauna in the vicinity. - No speeding or undue hooting to be undertaken - Equip machinery with noise mufflers if required. - Notice of particularly noisy activities must be given to residents adjacent to the construction site. - Noisy activities must be restricted to normal weekday working hours and must comply with SANS standards. - There must be no undue noise created by staff 	Contractor	From site establishment and ongoing during construction
14. Air Quality / Dust	<ul style="list-style-type: none"> - Ensure that dust levels are kept to a minimum by retaining groundcover, dampening of surfaces as required without over-saturating the ground, and reinstating plots as soon possible. - Construction vehicles travelling to site and on site must adhere to speed limits and avoid speeding. 	Contractor	From site establishment and ongoing during construction
15. Visual	<ul style="list-style-type: none"> - Practice a 'clean site' policy. - Keep material, implements and effects in designated areas within the site camp and individual construction sites. - Implement a daily litter and waste collection program as far as is feasible. - Ensure that lighting is directed downward so as not cause spillage and subsequent nuisance to residents 	Contractor	From site establishment and ongoing during construction

<p>16. Safety, security and socio-economic</p>	<ul style="list-style-type: none"> - All visitors must sign into the main camp site. - Warning and guiding signage must be set up for safety purposes - Firefighting equipment must be held on site - An emergency response plan and traffic control plan are required. - Excavations and construction site within each plot/property must be demarcated. - No open and uncontained fires are allowed on site, other than at a designated area within the camp site. This area must be paved, and fires must be made within a drum or similar with no potential for spreading. Burning of waste for any purpose is prohibited. - Ensure that residents are informed in advance of potential disruptions. - All complaints received from the public must be documented in a register, with the date and time, name of complainant, complaint and close out status and persons involved in close out. The beneficiaries and public must be made aware of this register via signage and the PLC/PSC/ward committee. This register must be available for review on request by the ECO and DEDTEA. - Staff must not be discourteous to residents. - Community members and those residing in the area must be given first preference for employment and procurement opportunities according to their skills. Women in particular must be given a higher number of employment opportunities. - Use labour intensive methods where possible to increase employment opportunities. 	<p>Contractor</p>	<p>From site establishment and ongoing during construction</p>
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	<ul style="list-style-type: none"> - All agreements made between the residents with the contractor, or applicant, must be documented and held on site. - Ensure that all materials and stockpiles are stored in such a way that they may not cause harm to both beneficiary property, general public and natural environment 		
<p>17. Heritage and Palaeontology</p>	<ul style="list-style-type: none"> - It is recommended that an archaeologist is assigned during bush clearing to further assess the area. - Prior to construction, contractors should be given training on how to identify and protect archaeological remains that may be discovered during the project. The pre-construction training should include some limited site recognition training for the types of archaeological sites that may occur in the construction areas. Some of the indicators of archaeological site that may be found during construction: <ul style="list-style-type: none"> - Flaked stone tools, bone tools and loose pieces of flaked stone; - Ash and charcoal; - Bones and shell fragments; - Artefacts (e.g., beads or hearths); - Packed stones which might be uncounted underground, and might indicate a grave or collapse stone walling. - All construction within a radius of at least 10m of such indicator should cease and the area be demarcated by a danger tape. Accordingly, a professional archaeologist or Amafa officer should be contacted immediately. In the meantime, it is the responsibility of the 	Contractor	From site establishment and ongoing during construction

	<p>Environmental officer and the contractor to protect the site from publicity (i.e., media) until a mutual agreement is reached. It is mandatory to report any incident of human remains encountered to the South African Police Services, Amafa staff member and professional archaeologist.</p> <ul style="list-style-type: none"> - Noteworthy that any measures to cover up the suspected archaeological material or to collect any resources is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement by Amafa or a professional archaeologist. <p>Procedure for chance palaeontological finds: The following procedure must be considered in the event that previously unknown fossils or fossil sites are exposed or found during the life of the project:</p> <ul style="list-style-type: none"> - Surface excavations should continuously be monitored by the ECO and any fossil material be unearthed the excavation must be halted. - If fossiliferous material has been disturbed during the excavation process it should be put aside to prevent it from being destroyed. - The ECO then has to take a GPS reading of the site and take digital pictures of the fossil material and the site from which it came. - The ECO then should contact a palaeontologist and supply the palaeontologist with the information (locality and pictures) so that the 		
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	<p>palaeontologist can assess the importance of the find and make recommendations.</p> <ul style="list-style-type: none"> - If the palaeontologist is convinced that this is a major find an inspection of the site must be scheduled as soon as possible in order to minimise delays to the development. - From the photographs and/or the site visit the palaeontologist will make one of the following recommendations: - The material is of no value so development can proceed, or: - Fossil material is of some interest and a representative sample should be collected and put aside for further study and to be incorporated into a recognised fossil repository after a permit was obtained from SAHRA for the removal of the fossils, after which the development may proceed, or: - The fossils are scientifically important and the palaeontologist must obtain a SAHRA permit to excavate the fossils and take them to a recognised fossil repository, after which the development may proceed. - If any fossils are found then a schedule of monitoring will be set up between the developer and palaeontologist in case of further discoveries. 		
POST CONSTRUCTION			
<p>18. Site reinstatement and rehabilitation</p>	<ul style="list-style-type: none"> - Reinstatement and rehabilitation of houses will be done progressively, immediately after each house has been completed. 	<p>Contractor</p>	<p>After completion of construction</p>

	<ul style="list-style-type: none"> - Repair all erosion and stabilize embankments. - Contour the sites so that it is continuous with the surrounding topography. - Rip (with picks) severely compacted areas and till /hoe the site to loosen / break up surface clods. - Reinststate topsoil and rip the areas. - Grassing must be undertaken, preferably use of non-invasive species, to provide erosion control. The areas can be hand seeded or use instant turf. However, should the homeowners not require grass, then the grassing can be omitted. - The control of alien invasive and exotic plants within disturbed and revegetated areas in the vicinity of the watercourses and sensitive terrestrial areas, following construction, is important. - Disassemble and remove all temporary structures, including all hardened surfaces, bund areas, etc. and discard the waste material, including other waste (concrete, litter, domestic waste, bunds etc) at a registered waste disposal site according to the waste stream and retain disposal slips. - Completely remove all residual stockpiles, materials and implements throughout the sites. - Ensure that when final restoration is complete, alien invasive plants and weeds have been removed, erosion has been repaired and no 		
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	opportunities exists for instability, wash-away or erosion issues which could undermine the housing.		
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11. CONCLUSION

Management and mitigation measures are presented herein for the activity. It is the responsibility of the Applicant to ensure that this EMPr is made binding on his contractor by either including the EMPr in the contract documentation or allotting a blanket item for environmental management in the contract document. The Contractor must thoroughly familiarise himself with the requirements of the EMPr in order to be compliant. Non-compliance with the EMPr is a legal offence and the DEDTEA can take legal action against an individual, organisation or group, for such non-compliance.

The impacts of the activity and project can be mitigated or managed through implementation of this EMPr.

Annexure A: Declaration of understanding and commitment to adopting the EMPr

Declaration of understanding and commitment to adopting the EMPr

Company name: _____

Authorized representative name: _____

Designation _____

I, as the authorized representative with details stated above, hereby declare that I understand and accept this EMPr for the construction of Mathulini Housing in Umshwathi, and undertake to be fully compliant with the contents.

Our company understands and accepts that non-compliance with this EMPr can result in legal action being instituted against our company.

Date: _____

Signature: _____

Witness: _____

Witness: _____

