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**ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)
EDTEA REF NO: DC28/0005/2021: KZN/EIA/0001542/2021**

**The Proposed Upgrading of Nkandla Weir Within Mhlathuze River
Catchment(Quaternary Catchment W12A), Nkandla Local Municipality, King
Cetshwayo District, KwaZulu-Natal.**

APRIL 2021



Prepared for:

Mariswe (Pty) Ltd.



On behalf of:

King Cetshwayo District Municipality.

PROJECT DETAILS**Developer (DEV)**

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LIST OF ACCRONYM

C	Contractor
DEDTEA	Department of Economic Development, Tourism and Environmental Affairs
DEV	Developer
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
I&AP	Interested and Affected Parties
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMWA	National Environmental Management Waste Act (Act 59 of 2008)
NHRA	National Heritage Resources Act (No. 25 of 1999)
NWA	National Water Act (No 36 of 1998)
PM	Project Manager
PPA	Project Principal Agent
PTO	Permission to Occupy
RoD	Record of Decision
SAHRA	South African Heritage Resources Agency
ToR	Terms of Reference

GLOSSARY OF ITEMS

ARCHAEOLOGICAL RESOURCES: includes (a) material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years including artefacts, human and hominid remains and artificial features and structures; (b) rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation; wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters.

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP): describes the main environmental management requirements that the Contractor must comply with during the construction phase to ensure that the environment is considered, negative impacts avoided or minimised, and positive impacts enhanced. The CEMP is critical to the principal Contractor and the Contractor's Environmental Officer (EO) as well as any sub-contractors performing work on the principal Contractor's behalf.

CONSTRUCTION PROJECT MANAGEMENT TEAM: The team consists of a Project Manager as well as a Safety and Health Officer as required in terms of the Occupation Health and Safety Act (Act 85 of 1993) (OHSA) and an Environmental Control Officer (ECO) as required in terms of NEMA.

CONTRACTOR: companies and or individual persons appointed on behalf of the client to undertake activities, as well as their subcontractors and suppliers.

DEVELOPMENT: the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity but excludes any modification, alteration or expansion of such a facility, structure or infrastructure and excluding the reconstruction of the same facility in the same location, with the same capacity and footprint.

DEVELOPMENT FOOTPRINT: any evidence of physical alteration as a result of the undertaking of any activity.

ENVIRONMENT: in terms of the National Environmental Management Act (No 107 of 1998) (as amended) (NEMA), Environment means the surroundings within which humans exist and that are made up of:

- the land, water, and atmosphere of the earth;

- micro-organisms, plants and animal life;
- any part or combination of (i) of (ii) and the interrelationships among and between them;
- the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

ENVIRONMENTAL CONTROL OFFICER (ECO): an individual nominated through the client to be present on-site to act on behalf of the Client in matters concerning the implementation and day to day monitoring of the CEMP and conditions stipulated by the authorities as prescribed in NEMA.

ENVIRONMENTAL MANAGEMENT PLAN (EMP): A plan generated by the Contractor describing the relevant roles and responsibilities and how potential environmental risks will be assessed and managed including the monitoring and recording thereof.

ENVIRONMENTAL IMPACT: the change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services.

EMERGENCY: an undesired event that results in a probable significant environmental impact and requires the notification of the relevant statutory body such as a local or provincial authority.

FATAL FLAW: is an issue or conflict (real or perceived) that could result in developments being rejected or stopped.

HAZARDOUS WASTE: hazardous waste means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste have a detrimental impact on health and the environment.

INCIDENT: an is an event that may cause harm or potential harm to an environmental receptor e.g. air, water, land, wildlife or local habitat.

INDIGENOUS VEGETATION: refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.

INTERESTED AND AFFECTED PARTY (I&AP): for the purposes of Chapter 5 of the NEMA and in relation to the assessment of the environmental impact of a listed activity or related activity, an interested and affected party contemplated in Section 24(4) (a) (v), and which includes (a) any person, group of persons or organization interested in or affected by such operation or activity; and (b) any organ of state that may have jurisdiction over any aspect of the operation or activity.

MAINTENANCE: actions performed to keep a structure or system functioning or in service on the same location, capacity, and footprint.

METHOD STATEMENT: a method statement is a written submission by the Contractor to the Engineer in response to the specification or a request by the Engineer, setting out the plant, materials, labour, and method the Contractor proposes to carry out an activity, identified by the relevant specification or the Engineer when requesting a Method Statement. It contains sufficient detail to enable the Engineer to assess whether the Contractor's proposal is in accordance with the Specifications and/or will produce results in accordance with the Specifications.

MITIGATION: the measures designed to avoid reduce or remedy adverse (negative) impacts.

POLLUTION: the NEMA defined pollution to mean any change in the environment caused by the substances; radioactive or other waves; or noise, odours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience, and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.

PROJECT ENVIRONMENTAL SPECIFICATION (PES): describes standards specific to a particular project. Variations and additions to the SES are set out in this PES. These would include the Environmental Authorisation (EA) issued to the project or elements generally drawn from the EA. The PES may also require a more stringent standard to that described in the SES if required by the EA or a particular industry code to which the project subscribes including any environmental constraints at a construction site. The PES need not be a separate document; however, it can be in a format of an appendix/addendum making reference to the EA, permit(s) or licence(s) applicable to the project. In cases where the project does not trigger any of the NEMA listed activities or any permit(s)/licence(s), the PES may be compiled to prescribe additional environmental management measures over and above the measures stipulated on the SES.

REHABILITATION: rehabilitation is defined as the return of a disturbed area to a state which approximates the state (wherever possible) which it was before the disruption.

SAFETY, HEALTH AND ENVIRONMENTAL (SHE) OFFICER: the SHE officer is a contractor's representative, responsible for the safety, health and environmental aspects on the construction site. The SHE officer will be responsible for the day-to-day monitoring of the EMP and Health and Safety Plan as per the OHSA.

STANDARD ENVIRONMENTAL SPECIFICATION (SES): describes the minimum standards for environmental management for a range of environmental aspects associated with all construction projects with which the Contractor must comply.

WATERCOURSE: can be a) a river or spring; b) a natural channel or depression in which water flows regularly or intermittently; c) a wetland, lake or dam into which, or from which, water flows; and/or d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act, 1998 (Act No. 36 of 1998) (NWA) and a reference to a watercourse includes, where relevant, its bed and banks.

WATER POLLUTION: the NWA defined water pollution to be the direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it less fit for any beneficial purpose for which it may reasonably be expected to be used; or harmful or potentially harmful (aa) to the welfare, health or safety of human beings; (bb) to any aquatic or non-aquatic organisms; (cc) to the resource quality; or (dd) to property.

WETLAND: a land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

WORKFORCE: refers to the entire project team including people employed by the Applicant/Client/Developer directly, his Principal Agent or the Contractor, persons involved in activities related to the project, or person present at or visiting the construction area, including permanent contractors and casual labour.

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1 INTRODUCTION

Emvelo Quality and Environmental Consultant has been appointed by Mariswe (Pty) Ltd, on behalf of King Cetshwayo District Municipality as an independent Environmental Assessment Practitioner (EAP) to undertake the environmental authorization processes as required by NEMA and a host of related environmental legislation. As part of this process, this is an Environmental Management Programme (EMPr) report which will be used to promote and ensure environmental monitoring and control during the planning and design, construction and operational phases of the proposed development, has been compiled. The contents of this EMPr have been compiled according to the prescribed legal requirements contained in Appendix 4 of the Amended EIA Regulations, 2017.

2 PURPOSE OF THIS DOCUMENT

The purpose of this EMPr is to ensure that the environmental impacts of the various phases of the development of the receiving environment are managed, mitigated and kept to a minimum. The document is binding on the Applicant; all contractors and sub-contractors; and visitors to the site. It must be included as part of any tender, as well as contractual documents between the applicant and any contractors. This will ensure that all environmental impacts are managed for the duration of project cycle. This document requires that responsibility, accountability, and commitment are promoted by the developer, the main contractor, and sub-contractors.

3 OBJECTIVES OF THE EMPR

The objectives of this document are to:

- Encourage good management practices through planning and commitment to environmental issues;
- Define how the management of the environment is reported and performance evaluated;
- Provide rational and practical environmental guidelines to:
 - Minimise disturbance of the natural environment;
 - Prevent or minimise all forms of pollution

- Protect indigenous flora and fauna;
- Prevent soil erosion and facilitate re-vegetation of affected areas;
- Comply with all applicable laws, regulations, standards, and guidelines for the protection of the environment;
- Adopt the best practical means available to prevent or minimise adverse environmental impacts;
- Ensure that the construction and operational phases of projects are undertaken within the principles of Integrated Environmental Management;
- Develop waste management practices based on prevention, minimisation, recycling, treatment or disposal of waste;
- Describe all monitoring procedures required to identify impacts on the environment;
- Train employees and contractors with regards to their environmental obligations;
- Provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on-site; and
- Detail specifications deemed necessary to assist in mitigating the environmental impacts of Project.

4 SCOPE OF THE EMPR

In order to achieve the above objectives, the scope of work must be according to the requirements as stipulated in the EIA regulations, Government Notice No. 38282 as amended in 2017. The EIA regulations stipulate the requirements for the content of EMPr.

Therefore, the scope of the EMPr must include the following:

- Definition of environmental management objectives to be realised during the life of the project (i.e. construction, operation, and decommissioning phases);
- Definition of detailed actions needed to achieve these objectives, including how they will be achieved, by whom, by when, with what monitoring/verification, and to what target or performance level.

- Mechanisms must also be provided to address the changes in project implementation, emergencies or unexpected events and associated approval processes;
- Clarification of institutional structures, roles, communication and reporting processes required as part of the implementation of the EMPr;
- Description of the link between EMPr and associated legislated requirements;
- Description of the requirements for monitoring implementation of the EMPr, record keeping, reporting, review, auditing and updating of the EMPr.

5 GENERAL PROJECT INFORMATION

This general project information outlines the following:

- Proposed construction activities;
- Description of the receiving environment from the site; and
- Identification of potential environmental impacts.

5.1 Proposed construction activities

The proposed development is for the upgrade of the existing Weir at Mhlathuze River within (Quaternary Catchment W12A) in Nkandla Local Municipality, of the King Cetshwayo District.

The construction activities entails: The expansion of an existing weir by 24m (addition of 5m length on the left bank, and 19m length on the right bank); Filling the eroded bank downstream of the weir with mass concrete and plums up to the level of the water line in the plunge pool; Construction of a concrete slab at the left bank within a weir and a gabion slipway to cater for larger flood events at the edge of right bank.

5.2 Description of the receiving environment from the site

The construction activities will take place within aquatic environment at Mhlathuze River at Quaternary Catchment W12A under Pongola-Mtamvuma Water Management Area and is classified as a National Freshwater Ecosystem Priority Area (NFEPA) River.

The site is situated within the western region of King Cetshwayo District which is characterised of an undulating topography of inland hilly areas and steep valleys with elevation ranging between approximately 860m to 1040m above the mean sea level.

The site falls under a Savanna Biome, with vegetation comprise of Midland Mistbelt Grassland, underlain by Greenstone geological formation.

5.3 Activities and aspects causing impacts

Potential negative impacts that are likely to occur during the construction and operational phases are outlined on (**Table 1**) below.

Table 1: Identification of potential environmental impact

#	Proposed construction work activity	Potential negative impact
1	Site camp establishment, parking of construction vehicle, hauling material to site and spoils to suitable site (still to be identified)	Clearance of natural vegetation, pollution and accommodation of traffic (bio-physical environmental and social impact).
2	Vegetation clearance and excavation work at left and right river banks.	Clearance of geological features, clearance of natural aquatic vegetation (bio-physical environmental impact).
3	Removal of slit downstream from the weir basin and infilling of the eroded bank downstream of the weir with mass concrete and plums.	Working on watercourse, impending flow, removal of geological features, clearance of natural aquatic vegetation and pollution to water bodies (bio-physical environmental impact).
4	Installation of new sluice gate pedestals hand wheels and spindle.	Surface water pollution (bio-physical environmental impact).

5	Raising of the weir walls around the sluice gate pedestals by 500mm and construction of cover slabs	Surface water pollution (bio-physical environmental impact).
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5.4 Sensitive areas

The proposed upgrade will take place within the watercourse, which constitute ecological risks. However, will have minimum negative impacts on the environment provided that all sensitive areas are respected, and correct construction mitigations are followed.

The primary sensitive area relating to this project is the watercourse (Mhlathuze River) at the Nkandla Weir vicinity where the upgrade will take place. Therefore, any work in and around natural water bodies must be considered potentially negative and precautionary practices must be adopted.

Secondly, the project bares some of social negative impact, such as disturbance of traffic from the main road through construction vehicle turning to and from site next to Nkandla Water Treatment Works (WTW). Also, the noise pollution during construction can be another factor.

6 LEGISLATION REQUIREMENTS

The EMPr, which forms an integral part of the contract documents, informs the contractor as to his/her duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by the construction activities associated with project.

The contractor must note that obligations imposed by the EMPr are legally binding in terms of environmental statutory legislation (NEMA, Section 28, "Duty of Care"), the EA conditions, and in terms of the additional conditions to the general conditions of the contract that pertain to this project. In the event that any rights and obligations contained in this document contradict those specified in the standard or project specifications then the latter will prevail.

Additionally, in terms of NEMA (second amendment), a developer may be guilty of an environmental contravention and liable for a penalty of up to R10m or a 10-year prison term (or both) when listed activities are undertaken without an EA or the project does not comply to the conditions of the environmental authorisation (EA).

It is expected that the contractor is conversant with all legislation pertaining to the environment, including provincial and local government ordinances, which may be applicable to the contract. Some of the environmental legislation applicable to this type of project include, but are not limited to, the following legislation:

Table 2: Relevant legislations and environmental aspects

#	Legislation	Environmental Aspect
1.	Constitution of South Africa (Act No 108 of 1996)	Environmental rights of the local community
2.	National Environmental Management Act, 1998 (Act No. 107 of 1998);	Duty of care; reasonable measures; reporting of incidents; protection of workers; environmental whistleblowers; private prosecution; criminal proceedings; fines; EIA regs
3.	Environmental Conservation Act, 1989 (Act 73 of 1989)	Establishment of waste sites; littering
4.	National Environmental Management: Biodiversity Act (Act No 10 of 2004);	Plants, animals, threatened or protected species (TOPS)
5.	National Environmental Management: Waste Act. 2008 (Act No 59 of 2008)	Waste generation, storage and disposal
6.	The National Water Act, 1998 (Act 36 of 1998);	Watercourses (rivers, wetlands, etc.); water use
7.	Hazardous Substances Act (Act No 15 of 1973)	Hazardous substances and chemicals
8.	Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965);	Vehicle and machinery emissions

9.	National Environmental Management: Air Quality Act (Act 39 of 2004);	Emissions include dust
10.	National Forest Act (Act 84 Of 1998)	Indigenous and protected trees
11.	National Heritage Resources Act (Act 25 of 1999)	structures older than 60 years, archaeological (human remains, wrecks, rock art, artefacts of military history older than 75 years) or paleontological (fossil remains of animals or plants) or any meteorite or graves
12.	Fertilizer, Farm Feeds, Agricultural Remedies and Stock Remedy Act (Act No. 36 OF 1947)	Herbicides and pesticides
13.	The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983);	Soil erosion; spreading of weeds (alien invasive plants)
14.	Advertising on Roads and Ribbon Development Act (Act 21 Of 1940)	Litter along public roads
15.	National Building Regulations and Building Standards Act (Act 103 of 1977)	Erection of buildings; building standards
16.	Occupation Health and Safety Act (Act 85 of 1993)	Safety of workers and the public
17.	Fencing Act (Act 31 Of 1963)	Accessing properties; fences; farm gates
18.	Public Finance Management Act (Act 1 of 1999)	Fruitless, wasteful, and irregular expenditure arising from environmental incidents or non-compliance to EA/EMPr

7 DUTIES OF ROLE PLAYERS

A number of role players will be responsible for ensuring that environmental practices described for this report are implemented through each of the various phases of the project life cycle (construction, operations and maintenance, decommissioning). Formal responsibilities are necessary to ensure that all environmental procedures and actions are executed. Specific responsibilities of the Project Proponent, Project Manager/Project Principal Agent, Site Manager/Engineer, and Contractor/Operator are detailed below.

7.1 The Holder of Environmental Authorisation (Client / Project Proponent)

The Client (King Cetshwayo District Municipality) is the holder of the EA and is responsible for the implementation of the conditions of the authorization as well as the management measures contained in the approved EMPr (this report). In terms of NEMA, Section 28 (1) the construction of the pipelines and the associated infrastructure and the issuing of the EA implies that harm to the environment is authorised by law. Additionally, due to the need in the community for this essential service, such impacts cannot reasonably be avoided or stopped. Notwithstanding, King Cetshwayo District Municipality is required to minimise and rectify such pollution or degradation of the environment. All liabilities associated with the land will lie with the registered landowner. The holder is ultimately liable for the potential impact of the activities that are undertaken and is tasked with effective management of these impacts.

The holder of the EA is accountable for:

- Ensuring that all conditions of the EA and EMPr are complied with;
- Ensuring that all the necessary environmental licences and permits are in place before any construction activity can begin in an affected part of the project area/route;
- Appointing a contractor required for the management of environmental impacts, such as waste management and monitoring of any other required activity;
- Appointment of an Environmental Control Officer (ECO) as may be required for monitoring of implementation and compliance of the EA and EMPr during the construction phase;
- Assessment of all activities requiring special attention as specified and /or requested by the Project Principal Agent (PPA) or Project Manager (PM) and/or ECO for the duration of the contract;
- Ensuring that the Contractor conducts all activities in a manner that minimizes disturbance to the directly affected residents and public in general, as advised by the PPA and/ or ECO; and

- To order the Contractor, through the PPA, to suspend any or all works on-site if the Contractor or his subcontractor/supplier fails to comply with the any environmental specifications the EA and the EMPr.

7.2 The Engineer (Project Principal Agent)

Mariswe (Pty) Ltd. is the PPA for the Upgrading of Nkandla Weir within Mhlathuze River Catchment (Quaternary Catchment W12A), Nkandla Local Municipality, King Cetshwayo District, KwaZulu-Natal.

The PPA has overall responsibility for environmental management on site which includes the implementation of the EMPr. Therefore, the PPA roles and responsibilities include the:

- Overall responsibility for the implementation of the EMPr;
- The appointment of an ECO that will monitor the implementation of the CEMP;
- Assessment of all activities requiring special attention as specified and /or requested by the ENG and/or ECO for the duration of the contract; and ensures that the Contractor conducts all activities in a manner that minimizes disturbance to the directly affected residents and public in general, as advised by the ENG and/ or ECO.
- Ensuring that the Site Manager/Engineer and the Contractor/Operator are aware of all specifications, legal constraints, standards and procedures pertaining to the project specifically with regard to the environment;
- Ensuring that all stipulations within the EMPr are communicated and adhered to by Site Manager/Engineer and the Contractor/Operator;
- Assessing the Contractor's environmental performance in consultation with the ECO, and communicating directly with the Contractors on environmental issues observed on site;
- Liaising with the Contractor on the matters concerning the environment, and issuing of the non-conformance notifications to Contractors in consultation with the ECO;
- Arranging information meetings for and consulting with I&AP's about the impending construction activities;
- Maintaining a register of complaints and queries by members of the public at the site office. This register is to be forwarded to the ECO on a monthly basis;

- Ensuring the documentation of the state of the site prior to the commencement of construction activities, in conjunction with the Contractor;
- Preventing actions that will harm or may cause harm to the environment, and take steps to prevent pollution of the site;
- Reviewing and approving construction methods where necessary; and
- Instructing the Contractor to suspend any or all works on-site if the Contractor or his subcontractor/supplier fails to comply with the environmental specifications, and conditions of the EA or the EMPr.

7.3 Environmental Control Officer

The Environmental Control Officer (ECO) appointed by the PPA (on behalf of King Cetshwayo District Municipality) has the responsibility for ensuring compliance of the EA and EMPr, and undertaking regular monitoring of the site. The ECO is responsible for conducting the environmental audits, during the construction phase of the project, according to the provisions of the EMPr, CEMP and the EA.

The following are the duties of the ECO:

- To understand the background of the project and ensure the implementation of the EA conditions and the EMPr;
- To monitor the implementation of the EA conditions and the EMPr;
- To advise the PPA about the interpretation, implementation, and enforcement of the EA and EMPr and other relevant environment-related matters;
- To brief the Contractor about the requirements of the EA, Environmental Specifications and the EMPr, as applicable;
- To monitor and report to the PPA on the performance of the Contractor and the project in terms of environmental compliance;
- To be fully conversant with all related environmental legislation and ensure compliance;
- To ensure that all the environmental requirements contained within the EMPr are adhered to;

- To report all non-compliances with the EA and EMPr to the relevant authority, after consultation with the PPA;
- To regularly liaise with the Site Manager on matters relating to the environment; and
- To compile monthly reports as to the implementation of the EMPr which should include a percentage compliance status to the EA and EMPr conditions.

7.4 Contractor

The Contractor shall comply with the requirements of the EA and EMPr and abide by the PPA's/PM's and ECO 's instructions regarding the implementation of the EMPr. The contractor shall:

- Comply with all applicable legislation;
- Be conversant with the requirements of the EA and the EMPr and ensure 100% compliance to all conditions therein;
- Induct and educate all staff, including sub-contractors, about the requirements of the EA and EMPr;
- Ensure that sub-contractors/suppliers who are utilised within the context of the contract comply with the environmental requirements of the EA and EMPr. The Contractor will be held responsible for non-compliance on their behalf;
- Supply the method statement for all activities requiring special attention as specified and/or requested by the Engineer or ECO during the duration of the Contract;
- Inform and educate their employees about the environmental risks of their work and the manner in which their tasks must be performed in order to avoid causing significant pollution or degradation of the environment (environmental training); and retain records of such training undertaken
- Bear the costs of any damages/ compensation resulting from non-adherence to the EA and EMPr or written site instructions;
- Conduct all activities in a manner that minimizes the disturbance to directly affected residents and the public in general, and foreseeable impacts on the environment; and

- Ensures that the PPA is timeously informed of any foreseeable activities that will require input from the ECO.

7.5 Contractor's Safety, Health and Environmental (SHE) Officer

The Contractor will appoint a Safety, Health and Environmental (SHE) Officer or an equivalent resource with the documented responsibility and letter of appointment for environment-related issues on this project, before commencement of any work on site. Such a resource will be responsible to ensure implementation of the requirements of the EA, EMPr, EMP, SES and PES where applicable. The contractor's SHE Officer should have relevant environmental qualifications and experience required for the project.

The Contractor's SHE Officer will liaise with the ECO appointed by developer or the PPA.

The responsibilities of the Contractor's SHE Officer are to:

- Be fully conversant with the CEMP, EMP, SES, PES and other relevant environmental requirements;
- Be fully conversant with the EA and EMPr, and ensure 100% compliance to all conditions therein;
- Be fully conversant with all relevant environmental legislation applicable to project, and ensure 100% compliance;
- Compile Method Statements together with the Principal Contractor that will specify how potential environmental impacts in line with the requirements of the CEMP will be managed, and, where relevant environmental best practice and how they will practically ensure that the objectives of the CEMP are achieved;
- Convey the contents of this EMPr to the construction site staff and discuss the contents in detail with the Contractor by means of conducting ongoing Environmental Awareness and Training of the Contractor's site personnel through the means of toolbox talks and other means of communication;
- Undertake daily and weekly inspections of the work area(s) as per schedule or authorised through written instruction by PPA or ECO;
- Ensure conformance/compliance to the EMPr, licenses and permits and approved Environmental Method Statements;

- Monitor and verify that negative environmental impacts are kept to a minimum, as far as possible;
- Report any non-compliance or remedial measures that need to be applied, to the ECO and PPA, in line with the requirements of the EMPr;
- Order the removal from the construction site of any person(s) and/or equipment in contravention of the specifications of the EA and EMPr;
- Maintain an environmental management file and all relevant documentation and records related to environmental management;
- Maintain a hazardous substances register; and
- Present a report at each site meeting which will document all incidents that have occurred during the period before the site meeting.

8 ENVIRONMENTAL CAPACITY BUILDING PLAN

The environmental capacity building plan includes the schedules records of environmental training, induction, community involvement, and communication strategy.

8.1 Environmental training

The project team will be briefed on environmental aspects associated with the project, the compliance to environmental standards, licences and permits, the EA and the EMPr.

8.2 Induction

All staff and labourers will be required to attend a site environmental induction session, conducted in their preferred language. The site environmental aspects will be discussed during the induction session.

8.3 Community involvement

Affected and adjacent households must be informed about the construction activities, at least 7 days prior to commencement of the activities. Such I&APs must be also informed about the condition of the receiving environment and encouraged to report any environmental non-compliance by the Contractor to the PPA, subsequently the ECO.

8.4 Communication strategy

The environmental communication strategy will be developed, so that the project team and all relevant I&APs will follow a documented communication procedure. The PPA will be responsible for the communication throughout the project.

Emergency and incident reporting structures will be designed to handle any emergencies or incidents that might arise at the construction site and surroundings. The community strategy must include a designated disaster management team and community representatives. Emergency contact numbers and procedures will be communicated with the employees and community.

9 ENVIRONMENTAL CODE OF CONDUCT

One of the objectives of the EMPr is to ensure that all the workers, contractors, sub-contractors and construction staff on this project, have an understanding of basic and relevant environmental issues and the potential impacts of on-site activities. This Environmental Code of Conduct provides the basic rules that must be strictly adhered to. It is the responsibility of the ECO to ensure that each contractor, sub-contractor and workers understands and adheres to the Code of Conduct.

All persons are obliged to abide by the Code of Conduct. Therefore, ignorance, negligence, recklessness or a general lack of commitment will be in compliance to the Code of Conduct.

9.1 Environmental Rules

The environmental rules apply to all personnel on site to:

- Prevent pollution;
- Prevent littering;
- Dispose all waste in the correct waste containers provided;
- Use the toilet facilities provided and not utilise the natural environment for their ablutions;

- Immediately report to the supervisor when a spillage occurs or becomes aware of a hazardous substance spillage from a vehicle, equipment, machinery or container;
- Not enter any property with the landowner or occupier's permission;
- Not dig, excavate or the erect any permanent or semi-permanent structure of any kind that is not in the scope of this project;
- Not excavate at proximity of grave sites, without the PPA's consent. All excavation must at least be 30m away from grave sites;
- Not climb over or through any fence or enter private and neighbouring properties;
- Maintain the character and visual quality of the area;
- Never deface, draw, add graffiti or cut lettering or any other markings on trees, rocks or buildings in the area;
- Collect all litter lying around and dispose correctly;
- Be familiar with basic fire-fighting procedures;
- Be aware of the locations of all fire-fighting equipment;
- Not to establish any fires allowed outside the confines of the construction camp;
- Not burn any waste;
- Care for plants and animals;
- Not injure, poach or kill any wildlife;
- Never damage, chop down or remove any tree or shrub (unless part of the scope of the project and the necessary permits/licences are in place);
- Refuse to perform any work if, in good faith and reasonably believe, at the time of the refusal that the performance of the work would result in an imminent and serious threat to the environment.

10 NON-COMPLIANCE

The application of a penalty clause to the Contractor will apply for incidents of non-compliance to the EA and EMPr, once the necessary investigations have been completed. The penalty imposed will be per incident and will be deducted from the Contractor's monthly payment certificate.

A non-compliance notice will be issued to the responsible contractor by the ECO via the Proponent's Project Manager. The non-compliance notices will be issued in writing, a copy filed in the generic EMPr file and will, as a minimum include the following:

- Time, location and date of the non-compliance;
- Name of the contractor responsible;
- Nature and description of the non-compliance;
- Root cause of the incident;
- Recommended / required corrective action to remedy/fix the incident;
- Recommended actions to prevent a recurrence of the incident; and
- Date by which the corrective and preventative actions will be completed.

The contractor shall act immediately when a notice of non-compliance is received and remedy/fix the non-compliance (where practical). Complaints received regarding activities on the development site pertaining to the environment shall be recorded in a dedicated incident register and the response noted with the date and action taken. The ECO must be made aware of any such complaints. Any non-compliance with the agreed procedures of the EMPr is a transgression of the various statutes and laws that define the manner by which the environment is managed. Failure to redress the cause shall be reported to the relevant Competent Authority (CA).

The contractor is deemed to be in non-compliance with the EA and the EMPr if, *inter alia*, there is a deviation from any environmental condition, environmental requirement, license or permit condition, or whose actions may cause an environmental impact.

11 PRE-CONSTRUCTION

11.1 Environmental file

Table 3: Contents of environmental file

Impact Management Outcome: All relevant environmental documents and records are easily accessible to facilitate compliance to the EA and EMPr						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible Person	Frequency	Proof of compliance
Content of Environmental File must include but not limited to these docs: <ul style="list-style-type: none"> • Environmental Authorization • Relevant environmental permits and licences • Site Access Certificate (PTO) • Site Closure Inspection Form • Site layout plan • Waste Disposal Certificates • Environmental Site Rules / Environmental Awareness Toolbox Talk • Environmental training schedule and records 	ECO & PM	Make use of EA and other authorisation conditions. Have a lever arch file, divided for the different docs and clearly labelled.	Project Implementation. Pre-construction	ECO	Monthly	In line with EA, WUL: GA and other environmental permits and licences

<ul style="list-style-type: none"> • All audit reports and daily site inspection reports • Complaints Incident Register • EMPr, CEMP, PES as supplied by PPA, and EMP by Contractor • Signed Declaration of Understanding • Other Environmental Standards required for this project • Contractor's information • Contractor's Environmental Method Statements • Contractor Environmental Policy • Contractor Organogram • Appointment of Contractor' SHE Officer and Declaration of Understanding (Including CV) • Schedule of Contractor' Plants and Equipment • MSDS and Hazardous Substance Register • Emergency Contact Register 						
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11.2 Environmental Capacity Building

Table 4: Environmental communication and awareness

Impact Management Outcome: All workers are aware of environmental impacts, understand their individual responsibilities in terms of this EMPr and are able to minimize the negative environmental impacts of the project						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible Person	Frequency	Proof of compliance
<ul style="list-style-type: none"> The project team must receive environmental training on the environmental legislation, EA and EMPr conditions; 	ECO & PM	Through scheduled sessions or as part of contract meeting	Initial contracts meeting	ECO	Once	Minutes/ Attendance Registers
<ul style="list-style-type: none"> All staff and construction labourers must receive environmental training on the EA and EMPr conditions; 	ECO, SHE Officer & CM	Through scheduled sessions	Prior to site establishment, and when required	ECO	Monthly	Attendance Registers
<ul style="list-style-type: none"> All visitors to undergo environmental induction training. 	CM & SHE Officer	Through Site Environmental Rules	Duration of a project	ECO	Monthly	Attendance Registers
<ul style="list-style-type: none"> The Contractor to maintain effective communication with all relevant I&APs. 	CM & SHE Officer	Information Posters & Suggestion scheme	Duration of a project	ECO	Monthly	Information poster at site office & work areas. Communication Records

11.3 Construction site camp establishment

Table 5: Construction site camp establishment

Impact Management Outcome: Site camps have zero to minimal environmental impacts for the duration of the project						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible Person	Frequency	Proof of compliance
<ul style="list-style-type: none"> Establish the site camp on existing disturbed areas and not in environmental sensitive areas. Site camp be establish at least 100m away from the watercourse. 	PM, CM & ECO	Client or Local authorities to designate the area for site camp. PM, CM & ECO prior site visit.	Prior to site establishment.	ECO	Once	Permission to Occupy (PTO) Letter, and photographs of prior to site establishment.
<ul style="list-style-type: none"> Minimise/prevent disturbance or damage to indigenous vegetation when clearing the site. 	PM, CM & SHE Officer	Buffer and mark all red data plant species	Prior to site establishment, and during the project	ECO	Monthly	Photographs prior to site establishment, measured with current status
<ul style="list-style-type: none"> Strip topsoil together with grass / groundcover from all areas where temporary structures are located, and stockpile topsoil. Use topsoil for site rehabilitation 	PM, CM & SHE Officer	Rehabilitation Plan	During site establishment	ECO	Monthly	Images and adherence to rehabilitation plan.

<ul style="list-style-type: none"> Always maintain the site camp perimeter fence. Allow for fauna migration. Fencing must not obstruct the species migration corridors. 	PM, CM, & SHE Officer	Site Camp layout plan. Ensure that correct fence is used, as well as away from migration corridors	During site establishment	ECO	Monthly	Images, and Construction Site Camp layout plan
<ul style="list-style-type: none"> The construction site camp must have: Site office, demarcated site for parking and maintenance of vehicles, refuse bins and skips, employee welfare facilities (ablution, shelter, water), refueling area and sign; designated smoking area. 	PM, CM, & SHE Officer	Construction Site Camp layout plan	During site establishment	ECO	Monthly	Images and adherence to Construction Site Camp layout plan.
<ul style="list-style-type: none"> Mobile chemical toilets must be provided onsite, with a minimum ratio of one toilet per 15 staff members, male and female separately. Mobile toilet must be serviced at regular intervals by approved service provider and be place not less than 100m away from watercourses. 	PM, CM and SHE Officer	Provision of toilets close to working areas during the project.	Duration of a project	ECO	Monthly	Images, Service Certificates

11.4 Site access and movement of construction vehicles

Table 6: Access to construction site

Impact Management Outcome: Access to sites have zero to minimal environmental impacts for the duration of the project.						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible Person	Frequency	Proof of compliance
<ul style="list-style-type: none"> • Make use of existing access routes to construction areas where possible. • Construct approved vehicle turning areas, and erect relevant road safety signage at strategic points for accommodation of traffic. Also, have turning area routes approved by the PPA &ECO. • Temporary access roads must be rehabilitated after usage. • Construction staff may only use authorized paths and roads. • Rehabilitate the access road upon completion of the construction period. 	PM, CM, ECO and SHE Officer	<p>Permission of access.</p> <p>Implement rules to be applied to all drivers including the delivery personnel.</p> <p>Temporary road signs.</p>	Initial contracts meeting	ECO	Monthly	<p>Accommodation of traffic/ no incidents. Site rules and registers.</p> <p>Photographs, and permission of access.</p> <p>Adherence to rehabilitation plan.</p>

12 CONSTRUCTION PHASE

12.1 Storages, stockpiling and material hauling

Table 7: Storages, stockpiling and material hauling

Impact Management Outcome: All The storage, stockpiling and transportation of all hazardous materials will be managed to ensure zero to minimal negative environmental impacts.						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible Person	Frequency	Proof of compliance
<ul style="list-style-type: none"> Store hazardous materials in a secure storage and have MSDS. Hazardous material must be stored in secure tight containers on liquid tight flooring to prevent seepage into the ground. 	CM & SHE Officer	Restricted access to hazardous materials	Construction Phase	ECO	Monthly	Photographs, MSDS and Hazardous Chemical Substances (HCS) list
<ul style="list-style-type: none"> Stockpiles and storage yards must be demarcated in areas already disturbed or where they will cause minimal disturbance. Waste storage must be stored so as to prevent leakages or being blown away, preferably undercover to prevent runoff from rains 	ECO, SHE Officer & CM	Checklist for storage and stockpiling. Demarcate areas and limit these activities to single sites only.	Construction Phase	ECO	Monthly	Photographs and checklists

Impact Management Outcome: All The storage, stockpiling and transportation of all hazardous materials will be managed to ensure zero to minimal negative environmental impacts.

Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible Person	Frequency	Proof of compliance
<ul style="list-style-type: none"> Clearly indicate which activities are to take place in which areas within the site. 						
<ul style="list-style-type: none"> All bulk material must be stored on site camp and move to sites only when required. All fine products must be covered during transportation and storage 	CM & SHE Officer	Checklist for Material Onsite. Just In Time (JIT) for production method.	Construction Phase	ECO	Monthly	Photographs and checklists

12.2 Vegetation clearance

Table 8: Vegetation clearance for pipeline route

Impact Management Outcome: The removal and/or disturbance of natural vegetation will be kept to a minimum to ensure zero to minimal negative environmental impacts.						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible Person	Frequency	Proof of compliance
<ul style="list-style-type: none"> The project boundary must be demarcated and vegetation clearing as well as topsoil removal must be limited to site only. Clearing of vegetation in wetland and riparian areas, when such activity is authorised must be restricted to areas demarcated by the project plans. 	PM, CM & SHE Officer	Site demarcation and establish no-go areas. Rehabilitation plan	Construction Phase	ECO	Monthly	Checklist, photographs, and adherence to site project layouts and rehabilitation plan.
<ul style="list-style-type: none"> All Red Data trees, plants or wildlife must be identified and protected. 	ECO, SHE Officer & CM	Conservation line to prohibit access to them.	Construction Phase	ECO	Monthly	Photographs and checklists
<ul style="list-style-type: none"> All Only the approved existing access road must be used, and vehicles must not traverse virgin land. 	CM & SHE Officer	Site rules	Construction Phase	ECO	Monthly	Site rules, no unauthorized access roads

12.3 Protection of aquatic environment

Table 9: Protection of aquatic environment

Impact Management Outcome: Zero to minimal negative environmental impacts on watercourses.						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible Person	Frequency	Proof of compliance
<ul style="list-style-type: none"> • Avoid sedimentation of nearest watercourses, by limiting all clearance and excavation along the weir expansion to areas as demarcated and approved by project plans. • Avoid vegetation clearance or soil disturbance, which is easily eroded and moved off the site via runoff. • All work to be done within sensitive riparian and instream habitats should be carried out during a low flow season (winter to early spring). • Where practical minimise the use of machinery within the riverbanks. Also, excavation work 	CM & SHE Officer	Construction site demarcation, establish no-go zones. Implement site environmental rules Rehabilitation plan.	Construction Phase	ECO	Monthly	Site demarcation, checklist, and Photographs. Site Environmental Rules.

Impact Management Outcome: Zero to minimal negative environmental impacts on watercourses.						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible Person	Frequency	Proof of compliance
must not be done during wet or peak flow periods.						
<ul style="list-style-type: none"> The use of heavy machinery (excavator) within the watercourse should be avoided as far as practically possible. The excavator be only position as far as possible within a river banks. 	CM & SHE Officer	Environmental Site rules	Construction Phase	ECO	Monthly	No hydrocarbons (oil& grease) observed during Water Quality Monitoring. Adherence to site rules.
<ul style="list-style-type: none"> All watercourses must be protected from direct and indirect spills, and debris from entering into watercourse. No disposal of any substance, such as cement, oil or bitumen, within the watercourses is permitted. 	CM & SHE Officer	Site rules Spill contaminant procedures Implement CEMP	Construction Phase	ECO	Monthly	Photographs and checklists. Adherence to CEMP.
<ul style="list-style-type: none"> Sediment barriers must be installed in areas sensitive to erosion to prevent stream siltation. 	CM & SHE Officer	Storm water management plan.	Construction Phase	ECO	Monthly	Photographs and checklists

12.4 Alteration of flow regimes and fluvial systems

Impact Management Outcome: Zero to minimal impact as a result of soil removal and/ infilling or deposition within a watercourse.						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible Person	Frequency	Proof of compliance
<ul style="list-style-type: none"> The best use of engineering designs to prevent alteration of flow regime within the weir site. To only use temporary cofferdams to divert flow for construction purposes. 	PM & CM	Engineering design	Construction Phase	ECO	Monthly	No alteration of flow regime, photographs, and adherence to project designs.
<ul style="list-style-type: none"> Stormwater management measures should be implemented in order to minimise diverted flows as the result of rains and prevent the siltation and sedimentation of nearby watercourse also minimise the impacts of the disturbed areas. 	CM& SHE Officer	Stormwater management plan	Construction Phase	ECO	Monthly	Photographs and checklists.
<ul style="list-style-type: none"> All excavation at riparian should not be undertaken during wet (rainy) periods or peak flow period. 	CM & SHE Officer	Site rules	Construction Phase	ECO	Monthly	Site rules, no signs of banks incision by erosion.

12.5 Protection of fauna

Table 10: Fauna and red data species protection

Impact Management Outcome: Zero to minimal negative environmental impacts on all fauna and red data species.						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible Person	Frequency	Proof of compliance
<ul style="list-style-type: none"> The project area must be surveyed for potential animal SCC prior to construction in order to locate, capture and relocate any animal SCC. Before vegetation clearance commences, the site must be inspected for birds that might forage along the river banks. Avoid habitat fragmentation and allow for fauna migration corridors. 	CM & SHE Officer	Checklist, Buffer and site rules	Construction Phase	ECO	Monthly	Site rules. Checklist and Photographs.
<ul style="list-style-type: none"> Aquatic species must be protect during construction. Inspect for aquatic species existence before temporary construction of coffer dams for dewatering and 	CM & SHE Officer	Checklist, Buffer and site rules	Construction Phase	ECO	Monthly	Site rules. Checklist and Photographs.

Impact Management Outcome: Zero to minimal negative environmental impacts on all fauna and red data species.

Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible Person	Frequency	Proof of compliance
concrete pouring. Should any species be found it must be moved to further areas onsite.						
<ul style="list-style-type: none"> All construction activities must take place within an area demarcated for the development. 	SHE Officer & CM	Construction site demarcation. Establish No-go zone.	Construction Phase	ECO	Monthly	Site rules. Checklist and Photographs.
<ul style="list-style-type: none"> The Contractor must ensure that the work site is kept clean, tidy and free of rubbish at all times, to prevent attracting animals and pests. 	SHE Officer & CM	Waste management	Construction Phase	ECO	Monthly	Photographs, receipts (registers), checklists. Site Rules
<ul style="list-style-type: none"> Poaching or killing of animals is prohibited. 	SHE Officer & CM	Site rules	Construction Phase	ECO	Monthly	Environmental Rules Attendance Register.

12.6 Waste management

Table 11: General and hazardous waste management

Impact management Outcome: All general and hazardous waste will be managed to ensure zero to minimal negative environmental impacts.						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible Person	Frequency	Proof of compliance
<p>General waste management:</p> <ul style="list-style-type: none"> Have sufficient bins for waste disposal. Refuse must be removed regularly to licensed landfill sites. Waste that is produced must be kept on-site and managed to prevent nuisance such as litter and dust. 	CM & SHE Officer	Integrated Waste Management approach: segregation of waste into separate bins	Construction Phase	ECO	Monthly	Photographs, receipts (registers), checklists. Site Rules.
<p>Hazardous waste:</p> <ul style="list-style-type: none"> Hazardous waste must be stored in a secured waste receptacle. All material contaminated with oils or hazardous material must be disposed of as hazardous waste. Waste bins need to be emptied/collected weekly by contractors and waste manifest signed by the site manager. 	SHE Officer & CM	Hazardous Waste Management	Construction Phase	ECO	Monthly	Waste manifest, disposal certificates, Registers, Checklist, and Photographs.

Impact management Outcome: All general and hazardous waste will be managed to ensure zero to minimal negative environmental impacts.

Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible Person	Frequency	Proof of compliance
<ul style="list-style-type: none"> Hazardous waste must be disposed of at a licensed facility and all records of waste manifest & disposal certificates needs to be kept in the Environmental File. 						
<p>Health Care (medical) Waste</p> <ul style="list-style-type: none"> Have separate “one-way” waste bins to dispose of medical waste. Do not mix medical waste with any other waste. Waste bins must be clearly marked and stored in safe place. Waste bins need to be emptied/collected regularly by contractors and waybills signed by the site manager. Medical waste must be disposed at the designated landfill site. Records of waste manifest and disposal certificates must be kept in the Environmental File. 	SHE Officer & CM	Health Care Waste Management Plan	Construction Phase	ECO	Monthly	Waste manifest, disposal certificates, Registers, Checklist, and Photographs.

12.7 Heritage and/or archaeological sites

Table 12: Heritage and archaeological

Impact Management Outcome: Zero to minimal negative environmental impacts on heritage resources, especially graves						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible Person	Frequency	Proof of compliance
<ul style="list-style-type: none"> If any artefact is discovered on site, work in the immediate vicinity shall be stopped immediately. Immediately report such discoveries to the ECO who will inform the KwaZulu-Natal Amafa and Research Institute Work may only resume once clearance is given in writing. 	PM, ECO, CM, SHE Officer & Heritage Practitioner	Site rules	Construction Phase	ECO	Monthly	Checklist, reports and photographs.
<ul style="list-style-type: none"> The construction site camp must be established away from grave sites or suspected grave sites at a distance of at least more than 50m from the nearest grave. 	PM, CM, ECO	Site screening and obtaining PTO.	Pre-construction (site establishment).	ECO	Once	PTO Letter, and photograph.
<ul style="list-style-type: none"> Construction vehicles must use the approved access roads. Construction machinery must be parked at designated areas. 	PM, CM & SHE Officer	Employee/Visitors Site Rules	Pre-construction and construction phase	ECO	Monthly	Site rules register

12.8 Soil management

Table 13: Soil management during excavation of pipeline trenches

Impact Management Outcome: Soil conservation and prevention of soil erosion						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible Person	Frequency	Proof of compliance
<ul style="list-style-type: none"> Prior to commencing with earthworks, the topsoil must be stripped and stockpiled separately from subsoil, if necessary. And must be kept for use during rehabilitation of disturbed areas 	CM, SHE Officer	Site rules. Rehabilitation Plan.	Construction Phase	ECO	Monthly	Checklist and photographs
<ul style="list-style-type: none"> Excavated material including topsoil must be stockpiled in stockpiles not exceeding 2m in height, in ideally flat area 32m away from the watercourse. 	CM & SHE Officer	Checklist and site rules	Construction Phase	ECO	Monthly	Checklist and photographs.
<ul style="list-style-type: none"> If at risk of being eroded, all stockpiles must be secured with sandbags around the base of the soil stockpile. And regularly be monitored to be kept free of weeds and invasive alien plants. 	CM & SHE Officer	Site Rules, and Checklist	Construction Phase	ECO	Monthly	Checklist, and Photographs.

12.9 Backfilling of trenches and site levelling

Table 14: Backfilling of trenches and construction site levelling

Impact Management Outcome: Soil conservation and prevention of soil erosion						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible Person	Frequency	Proof of compliance
<ul style="list-style-type: none"> Removed soil is to be used to backfill trenches. Excess topsoil is to be spread evenly over the area in a manner that blends in with the natural topography. 	CM & SHE Officer	Site Rules, Checklist, and Rehabilitation Plan	Construction Phase	ECO	Monthly	Checklist and photographs.
<ul style="list-style-type: none"> Excess sand and soil resulting from levelling activities of the work area should be stored in low heaps (less than 2m in height) either on the access road or already disturbed area. 	CM & SHE Officer	Checklist	Construction Phase	ECO	Monthly	Checklist and photographs.
<ul style="list-style-type: none"> Backfill material must be imported from an approved borrow pit. 	CM & SHE Officer	Checklist and Rehabilitation Plan.	Construction Phase	ECO	Monthly	Checklist, Waybills and photographs.

12.10 Air quality

Table 15: Air quality management

Impact Management Outcome: Air pollution is minimized through the application of dust prevention measures and good vehicle maintenance						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible Person	Frequency	Proof of compliance
<ul style="list-style-type: none"> Control all dust emanating from site due to project activities. Minimise or avoid dust generating activities during high winds. Minimising vegetation clearance, implement clearing in stages, at the areas demarcated for project and apply dust suppression actions when required to stabilise cleared soil. Surrounding neighbours must be informed if excessive dust will be generated. Soil stockpile be wetted for dust suppression. 	CM & SHE Officer	Dust suppression.	Construction Phase	ECO	Monthly	Checklist and photographs. No complaint
<ul style="list-style-type: none"> Control dust emanating from stockpiles, construction access roads, site construction activities, and from movement of construction vehicles. 	CM & SHE Officer	Dust suppression, Stockpile checklist, and regular cleaning of construction vehicles.	Construction Phase	ECO	Monthly	Checklist and photographs. Zero complaints

Impact Management Outcome: Air pollution is minimized through the application of dust prevention measures and good vehicle maintenance						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible Person	Frequency	Proof of compliance
<ul style="list-style-type: none"> Minimize emissions resulting from construction activities. 	CM	Servicing construction vehicles to meet emission requirement.	Construction Phase	ECO	Monthly	Checklist Zero complaints
<ul style="list-style-type: none"> All fine products must be covered during transportation. 	CM & SHE Officer	Site Rules and Checklist	Construction Phase	ECO	Monthly	Checklist and photographs.
<ul style="list-style-type: none"> Prevent air pollution by avoiding or minimizing the lighting of fires No open fires at construction sites. Cooking must be done at designated areas under controlled conditions to avoid spreading of fires. 	CM & SHE Officer	Site Rules	Construction Phase	ECO	Monthly	Photographs. Zero complaints

12.11 Servicing and re-fuelling of construction plants and vehicles

Table 16: Servicing and refuelling

Management Impact Outcome: Avoid or minimise soil, surface water, and groundwater contamination						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible person	Frequency	Proof of compliance
<ul style="list-style-type: none"> Designate a bunded area for servicing of vehicles at the construction site camp Use a dip tray in case of emergency repairs outside the workshop area. Check vehicles regularly for fuel and oil leaks and repair immediately. 	CM & SHE Officer	Checklist Portable Spill Clean-up Kits	Construction Phase	ECO	Monthly	Checklist, Photographs Zero incidents
<ul style="list-style-type: none"> Refuel vehicles only by means of a pump and in a bunded area created for refueling. 	CM & SHE Officer	Site Rules, Spill kits Checklist	Construction Phase	ECO	Monthly	Photographs Checklists
<ul style="list-style-type: none"> In case of oil spillages on site, clean spills immediately using appropriate spill kits. Treat and dispose contaminated soil and materials used as hazardous waste 	PM, CM & SHE Officer	Spill Contaminant Procedure	Construction Phase	ECO	Monthly	Incident Register Checklist Photographs.

12.12 Fire prevention

Table 17: Fire prevention

Management Impact Outcome: Prevention and control of fires and the spread of fires						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible person	Frequency	Proof of compliance
<ul style="list-style-type: none"> The Contractor must take all the necessary precautions to ensure that fires are not started as a result of activities on site. The Contractor must ensure that there is adequate fire-fighting equipment at the fuel stores. No open fires for heating or cooking will be permitted on site, unless otherwise agreed and then only designated areas, under controlled conditions. 	CM & SHE Officer	Site Rules, Checklist and Emergency Preparedness Plan	Construction Phase	ECO	Monthly	Checklist, Photographs, Zero Incidents
<ul style="list-style-type: none"> Smoking must be prohibited in the vicinity of flammable substances 	CM & SHE Officer	Site Rules and Designated Smoking Areas	Construction Phase	ECO	Monthly	Photographs Checklists
<ul style="list-style-type: none"> The workforce must be regularly made aware of fire prevention and basic firefighting measures. 	SHE Officer	Emergency Preparedness Plan	Construction Phase	ECO	Monthly	Induction Register
<ul style="list-style-type: none"> Emergency procedure must in place, and communicated to all persons onsite 	SHE Officer	Induction, toolbox talks, simulation excise/drill	Construction Phase	ECO	Monthly	Register

12.13 Public safety and traffic accommodation

Table 18: Road crossing and pipe jacking

Management Impact Outcome: Management of traffic during construction to minimise disruptions and safety risks to all road users.						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible person	Frequency	Proof of compliance
<ul style="list-style-type: none"> Prevent motor vehicle incidents to the general public, at construction vehicle turning point from main road to site and from site to main road. 	PM, CM & SHE Officer	Temporary traffic signs at strategic points from both side of the traffic. Flagmen during turning of large haulers.	Construction Period	ECO	Monthly	Photographs, Zero incidents
<ul style="list-style-type: none"> Establish the temporary speed limit at an approach to construction vehicle turning point. To be adhered to make sign visible to all motorist 	PM, CM & SHE Officer	Temporary traffic sign with speed limit.	Construction Period	ECO	Monthly	Photographs, Zero incidents
<ul style="list-style-type: none"> Temporary signing, traffic control signals, delineators, message boards, used for traffic accommodation in the work zone shall be visible by motorists and pedestrians. 	PM, CM & SHE Officer	Adhere to safety standards	Construction Period	ECO	Monthly	Checklist, Photographs

12.14 Invasive alien species

Table 19: Control of invasive alien species

Management Impact Outcome: Prevent the spread of invasive alien plants						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible person	Frequency	Proof of compliance
<ul style="list-style-type: none"> All invasive alien plants must be removed from areas under construction. The control and eradication of a listed invasive species must be carried out by means of methods that are appropriate for the species concerned and the environment in which it occurs. Prevent the spread of invasive alien plants by avoiding excessive vegetation clearing and leaving areas open 	CM & SHE Officer	Alien removal plan	Construction and rehabilitation phase	ECO	Monthly	Checklist, photographs
<ul style="list-style-type: none"> Manual methods such as cutting, weeding out, hoeing or pulling out by hand of invasive plants are recommended. 	PM, CM & SHE Officer	Alien removal plan	Construction and rehabilitation phase	ECO	Monthly	Checklist, photographs
<ul style="list-style-type: none"> Soil stockpiles must not be kept for extended periods as invasive alien 	PM, CM & SHE Officer	Checklist, JIT Method and Rehabilitation plan	Construction and	ECO	Monthly	Checklist, photographs

Management Impact Outcome: Prevent the spread of invasive alien plants						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible person	Frequency	Proof of compliance
plants will germinate and grow on such stockpiles.			rehabilitation phase			
<ul style="list-style-type: none"> Prevent the transportation of invasive alien plants from borrow pits to other areas Minimise movement of topsoil from one area to another to prevent the spread of invasive alien plants. 	PM, CM & SHE Officer	Approved borrow pits		ECO	Monthly	Registers and checklist

12.15 Noise

Table 20: Noise management during construction

Management Impact outcome: To minimise or prevent unacceptable noise levels during construction activities and at certain times of the day or week.						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible person	Frequency	Proof of compliance
<ul style="list-style-type: none"> In recognition of the inherently noisy and temporary nature of construction activities, specify standard construction hours during which the usual fixed noise limits do not apply. Avoid shouting or loud conversations especially in the early or late hours of the day. 	CM	Shift must be between (07h00-17h00)	Ongoing	ECO	Monthly	Zero complaints Time sheets
<ul style="list-style-type: none"> Minimise noise from construction activities to avoid impacts on human health and well-being If certain construction activities require work outside the stipulated hours, all adjacent landowners must be informed prior to commencement of such activities. 	CM	Commencing of any particularly noisy part of the activity (such as use of a masonry saw or jack hammer) must be after 09h00, and not on Sundays.	During site establishment and ongoing	ECO	Monthly	Zero complaints Filling records.
<ul style="list-style-type: none"> Minimise noise emanating from construction vehicles and equipment. 	CM	All equipment, vehicles, equipped with sound mufflers if necessary.	Construction phase	ECO	Monthly	Zero complaints, photographs, records.

13 POST CONSTRUCTION

13.1 Site camp decommissioning

Table 21: Site camp decommissioning

Management Impact outcome: Remediate/rehabilitate any negative environmental impacts at the site						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible person	Frequency	Proof of compliance
<ul style="list-style-type: none"> Remove all structures from site camp. All temporary structures, materials, waste and facilities used for construction activities are removed upon completion of the project. 	PM, CM & SHE Officer	Site Close-out Report Rehabilitation plan	During site camp decommissioning	ECO	Upon completion of the project	Close-out report Checklist, photographs
<ul style="list-style-type: none"> Use stockpiled topsoil to rehabilitate the construction site camp. Fully rehabilitate all disturbed areas and ensure erosion measures are in place. Only local indigenous plants should be considered for re-vegetation of the site. Such plants are able to establish themselves easily 	PM, CM & SHE Officer	Checklist	Once, During site camp decommissioning	ECO	Upon completion of the project	Checklist, photographs

13.2 Site clean-up and rehabilitation

Table 22: Site clean-up and rehabilitation

Management Impact Outcome: Site restoration to approximate original state						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible person	Frequency	Proof of compliance
<ul style="list-style-type: none"> The Contractor must ensure that all temporary structures, materials, waste and facilities used for construction activities are removed upon completion of the project. All waste must be disposed of responsibly, following five-step hierarchy of waste management Fully rehabilitate all disturbed areas and protect ensure erosion controls are in place, where necessary Only local indigenous plants should be considered for re-vegetation of the site. Such plants are able to establish themselves easily Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed 	PM, CM & SHE Officer	Rehabilitation plan	During site decommissioning	ECO	Upon completion of the project	Checklist, photographs

13.3 Maintenance during operation

Management Impact Outcome: Maintenance of site to meet its intended purpose during operation						
Impact Management Actions	Implementation			Auditing		
	Responsible Person	Method of Implementation	Implementation Period	Responsible person	Frequency	Proof of compliance
<ul style="list-style-type: none"> Manage the impact on flow regime of the Mhlathuze River within proximity of Nkandla Weir as a result of weir extension, through best construction practice that proper implement engineering designs. 	PM & CM	Construction supervision. Best practice weir design and construction practices Engineering design to mitigate extremely events from inundation upstream of the weir.	Throughout the project lifecycle	PM	Throughout the project lifecycle	Design standards, and best construction practice
<ul style="list-style-type: none"> Construct storm water system and make provision for erosion protection. Installation of gabion baskets and mattresses, energy dissipaters and grass lined drains Stormwater management through regular inspection for evidence of sediment and debris build-up during wet season. 	PM & CM	Engineering Design and Storm Water Management Plan.	Throughout the project lifecycle	PM	Throughout the project lifecycle	Storm Water Management Plan. Design standards, and best construction practice
<ul style="list-style-type: none"> Manage the changes to the backwater effect of the weir presence across the river. 	Project proponent (Developer)/ KCDM	Monitor and maintain the weir for stream incision, siltation and debris built up at upstream of the weir.	Operational phase	N/A	Operational phase	Photographs and reports

14 MONITORING

Monitoring will be undertaken to determine whether construction activities are impacting on the environment and that the EMPr is being implemented. Therefore, the preparation of a monitoring plan as part of an EMPr will ensure that the monitoring is conducted effectively and consistently and will deliver reliable, good quality data. Monitoring, in the broad sense, can also include visual evidence as well as a complaint register.

Monitoring will be an ongoing process to ensure that non-conformity is corrected, and necessary steps are taken timeously, to prevent further environmental degradation.

15 CONCLUSION

The application of the measures outlined in this Environmental Management Programme (EMPr) must ensure that the operation will have a minimal impact on the environment. If the measures outlined are not strictly adhered to, the contractor or responsible party can be charged and fined in terms of applicable legislation, and the project stopped. This EMPr will, therefore, administer and manage all activities on the project site and the actions of all the employees and agents of the Contractor.

This EMPr specifies the minimum environmental requirements to be implemented by the applicant as per the scope of works of the EMPr, in order to minimize and manage the potential environmental impacts and ensure sound environmental management practices are adhered to. It is essential that the EMPr requirements are carefully studied, understood, implemented and adhered to at all the time by all relevant parties on this project.

This EMPr has been developed to set out actions to be taken and standards to be met in order to avoid, control, reduce or remediate adverse (negative) environmental impacts of the pipeline and associated infrastructure and to ensure compliance to:

- The Environmental Assessment findings and recommendations;
- Legislation obligations;
- Permit requirements (e.g. plant or heritage permits);
- License conditions (e.g. EA or Water Use License); and
- King Cetshwayo District Municipality's environmental policies and standards.