2022

THE PROPOSED WELDED STEEL GRAVITY MAIN IN ZWELIBOMVU, ETHEKWINI MUNICIPALITY.

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

THE PROPOSED WELDED STEEL GRAVITY MAIN IN ZWELIBOMVU, ETHEKWINI MUNICIPALITY.	QAJANA GROUP CONSULTING | CONSTRUCTION	
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Project Title: THE PROPOSED WELDED STEEL GRAVITY MAIN IN ZWELIBOMVU, ETHEKWINI MUNICIPALITY.		

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Signature		
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SECTION 1 - INTRODUCTION

1.1 BACKGROUND

Qajana Trading (Pty) Ltd was appointed to represent eThekwini Metropolitan, Engineering Unit: Water and Sanitation as their independent Environmental Assessment Practitioner (EAP) to undertake the environmental services required for the proposed steel welded gravity main in ward 100 of the eThekwini Municipality. The proposed development requires an Environmental Authorisation prior to construction commencing. This EMPr contains the necessary information required in terms of the Integrated Environmental Management Guideline Series 5 (DEA, 2010) as well as the requirements of the EIA Regulations. Qajana Trading has been appointed to compile an Environmental Authorization proposal and part of the proposal is set to include the EMPr in order for it to be assessed together with the associated impacts and mitigation measures.

1.2 PROJECT DESCRIPTION

The proposed Ofudu to Inwabi steel gravity main entails of the following specification/works:

- 9 km Welded Steel Gravity Main;
- No off-takes will be connected;
- The pipe diameter is 300 mm; and
- More than 300 m^2 of vegetation will be cleared

1.3 PROJECT LOCATION

The pipeline is to be located adjacent to Road D1011 between Ofudu and Inwabi Reservoir within the Zwelibomvu area, outer west of Durban. It traverses within a district gravel road, and some private properties. Access to the site is via N3 Freeway west, Henry Pennington Road (formerly Richmond Road), MR468 and MR489 Provincial Roads, and Road D1011. The approximate Latitude and Longitude coordinates for the starting point of the pipeline are **29°53'59.08"S** and **30°42'52.16"E** and end point are **29°55'06.80"S** and **30°46'11.28"E.**

1.4 SITE CAMP

The proposed project will be constructing a steel gravity main from one reservoir to another (Ofudu to Inwabi). It is recommended that the site camp be within the premises of Ofudu reservoir as the site is already fenced and has security guards in the area. Furthermore, the proposed site camp is within the site boundary and in close proximity to the proposed

infrastructure route. The proposed site camp must comprises of a lockable container for the storage of goods, as well as the stockpiling and storage of construction materials, a site office and ablution facilities. The proposed site construction camp is appropriately fenced and will have to be sign-posted to prevent public access, as well as to provide adequate details of the construction project and contractor. The proposed site camp contains enough space to house a construction camp site as well as to ensure safe storage of construction materials. The proposed site camp co-ordinates are: 29°53'59.08"S and 30°42'52.16"E

Post construction, all necessary infrastructure contained within the site camp must be removed and rehabilitation measures, including re-grassing, must be implemented. Should any indigenous vegetation be found within the site camp, it will not be tampered with / cut down unless completely necessary. Should this vegetation be removed, it should be replaced with two specimens of the same species, for every item cut down.

1.5 PURPOSE OF EMPR

In terms of the Constitution of the Republic of South Africa (Act No. 108 of 1996) everyone has the right to an environment that is not harmful to their health or well-being. As well as to have the environment protected, for the benefit of the present and future generations, through reasonable legislation and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and the use of natural resources whilst promoting justifiable economic and social development. The needs of the environment as well as the affected parties should be duly considered and form part of the integral approach in the entirety of project. The proposed project should ensure compliance with the constitution and NEMA to achieve the principles of sustainable development. The EMPr sets to provide specifically for:

- The mitigation of risks identified in the basic assessment process and environmental authorization associated with the proposed development;
- Further identification of potential environmental risks/impacts that may arise on site during construction;
- Provide management and guidance in respect of addressing incidents that may be of risk to the local environment during the construction and operation stages of the development; and
- Ensure compliance with the environmental authorization

In accordance with the requirements of the NEMA impact assessment regulations of 2010, as amended in 2017, and the requirement of the competent authority (CA) which is the KwaZulu Natal Department of Economic Development, Tourism and Environmental Affairs (EDTEA). The EMPr is to be implemented by the Developer/ Applicant as well as any employee, contractor, agent or sub – contractor appointed to act on behalf of the Developer/ Applicant in the execution of the project, in order to ensure environmental compliance on site.

The specifications mentioned in the EMPr are applicable to all activities undertaken by the Developer/ Applicant as well as appointed contractors and all persons involved in the execution of the works including sub – contractors, the work force, suppliers and volunteers for the duration of the construction, operation and future maintenance. An Environmental Code of Conduct has been included, which provides a set of simplified rules that should be adhered to by all persons involved with the project at all times. The code of conduct is to be displayed at strategic points where it will encourage constant environmental awareness.

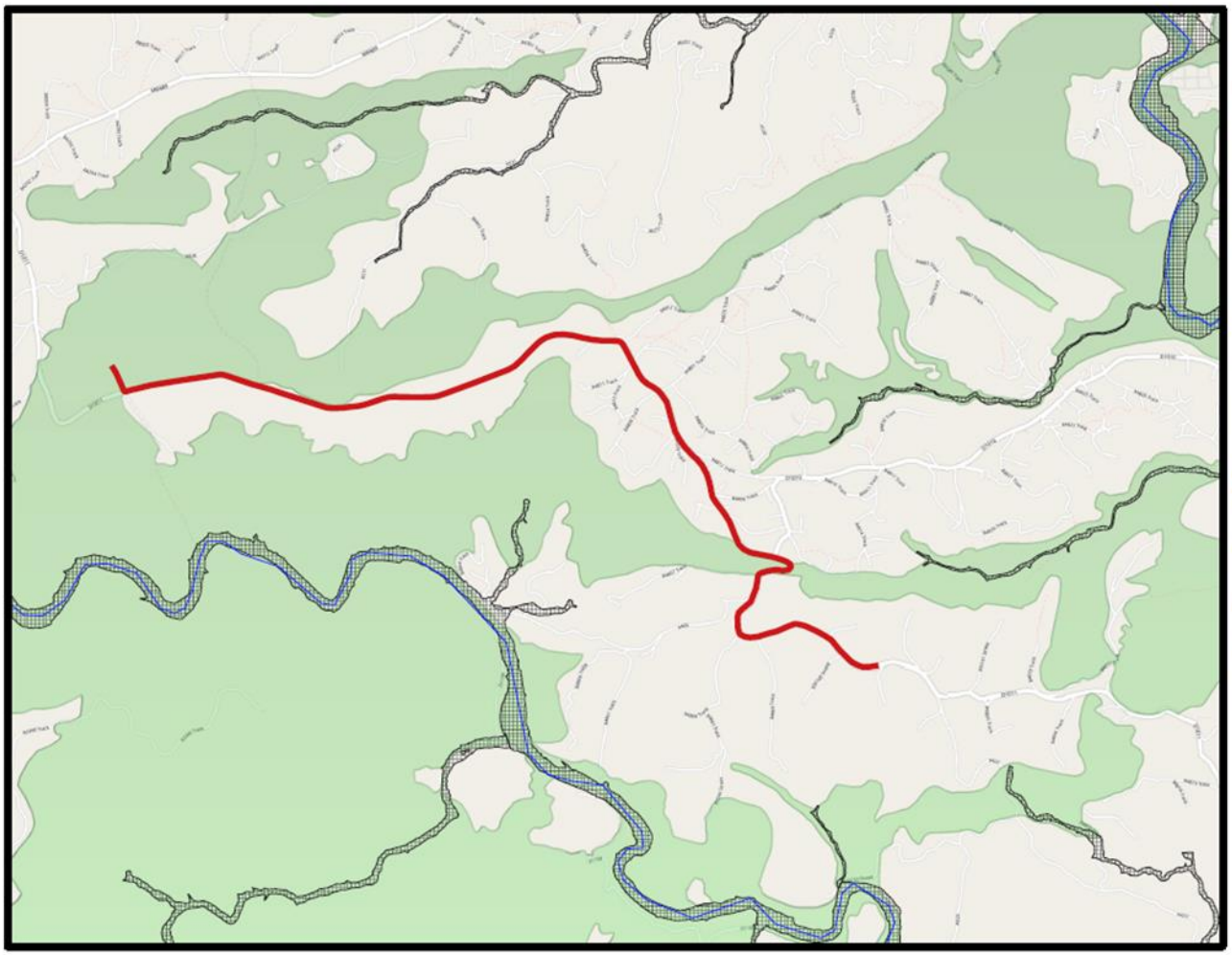
1.6 DETAILS OF EAP

The table below provides the details of the EAP; the full CV is attached in the annexures.

Details of the EAP	
Name of the Company	Qajana Trading Pty Ltd
Contact Person	Muziwandile Khuzwayo
Education	BSS Geography & Environmental Management (UKZN) MA Development Studies (UKZN) – Currently Finalizing Research Report.
Contact Details	muziwandilek@qajanagroup.co.za

Table 1.1: Details of the EAP

THE PROPOSED OFUDU TO INWABI GRAVITY STEEL MAIN



LEGEND

- OFUDU - INWABI PIPELINE
- Rivers
- Flood Plain 100yr
- DMOSS

OpenStreetMap

Applicant : EThekwini Metro - Water & Sanitation

Consultant : Qajana Trading

Map Created By : M. Khuzwayo

QGIS

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2. LEGISLATION

2.1 APPLICABILITY OF EIA REGULATIONS (2014)

The proposed Ofudu to Inwabi reservoir steel main is the motivation for the application, as the project intends to clear vegetation to make way for the pipeline. The proposed activity will require an Environmental Authorization (EA) in terms of the EIA Regulations, 2014 (as amended in 2017) as the proposed activity intends to clear more than 300 square meters of indigenous vegetation, which is considered as a critical biodiversity support area. The application for an EA will undergo the Basic Assessment process in terms of List Notice 3 (GNR327) of the EIA Regulations, 2014 (as amended in 2017).

GNR No & List	*Triggering Activity*	*Description*	*Stimulus*
GNR 324 Listing Notice 3	*Activity 12*	*The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.* ***(b) In KwaZulu-Natal:*** *i. Trans-frontier protected areas managed under international conventions;* *ii. Community Conservation Areas;* *iii. Biodiversity Stewardship Programme Biodiversity Agreement areas;* *iv. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;* *v. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;* *vi. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas;* *vii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning;* *viii. A protected area identified in terms of NEMPAA, excluding conservancies;* *ix. World Heritage Sites;* *x. Sites or areas identified in terms of an International Convention;*	*The project seeks to remove vegetation to make way for the proposed steel main.*

		xi. Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; *xii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; or* *xiii. In an estuarine functional zone.*	

Table 2.1: List Notice & Triggering Activities

2.2 OTHER APPLICABLE LEGISLATION

A growing awareness in the number of environmental laws and regulations, present company management with a task of monitoring, interpreting and implementing systems that produce a suitable plan to comply with the legal requirements. The list below was compiled to ensure that the person responsible for the activities of the proposed development is aware of the responsibilities and liabilities associated with thereof. Ensuring compliance with the relevant policies, laws and regulations will minimise the risk associated with non –compliance, be it legal, financial or rehabilitation costs. Non – compliance with the environmental law is a criminal offence and if prosecuted the Developer/ Applicant will be liable for any environmental damages incurred. Therefore, it is of critical value to ensure that compliance with the EMPr and the relevant laws is adhered to at all times. The Table below provides the legislation that applies to the development and the surrounding environment, including general legislation:

Legislation	Description
National Water Act (1998)	The proposed project should adhere to the act and ensure that any near – by water resources are not contaminated at any point of the development.
NEMBA (2006)	The act relates to the disturbance of fauna and flora found within and in close proximity to the site. It considers the ecological significance of the proposed site location.
National Forest Act (1998)	The act regulates the use and disturbance of forest organisms in the country. This report gives due consideration below to the proposed project and Section 7 of the Act which relates to the disturbance of protected species and the clearance of natural forest.
National Heritage Resources Act (1999)	The act governs the heritage resources that are in South Africa.
CARA (1983)	The act administers the control and prevention of veld fires, weeds and invader plants, which relate to the proposed activity.
Veld and Forest Fires Act (1998)	Encompasses the prevention of unauthorised veld and forest fires and such will have to considered for project due to the location.
Occupational Health & Safety Act (1993)	The act prescribes health and safety measures necessary to adhere to for all construction works.
By – Laws and Planning Policies	The development will have to consider the various municipal by – laws that affect the development. As well as the consideration of planning policies in place.

Table 2.2: Applicable Legislation.

3. IMPLEMENTATION & MONITORING

3.1 TABLE OF RESPONSIBILITIES

This section indicates the party and assigned responsibilities in the implementation of the environmental measure associated with the proposed sewer reticulation. The action plan is laid out well in the implementation plan of the document. Formal responsibilities are vital to ensure that key procedures are executed efficiently. Specific responsibilities of the Project Developer, Project Manager, Contractor/Operator, Environmental Site Officer (ESO) and Environmental Control Officer (ECO) are detailed below:

Role	Responsibilities
Project Developer	▪ Be fully conversant with the EA and EMPr for the project and all other environmentally-related licences and permits; ▪ Ensure that all stipulations within the EMPr are communicated and adhered to by the Project Developer and its Contractor(s); ▪ Make provision for monitoring the implementation of the EMPr throughout the project by means of site inspections and meetings. ▪ Overall management of the project and EMPr implementation; and ▪ Ensure that periodic site inspections are undertaken on the project implementation.
Project Manager (PM)	▪ Enforce the environmental specification on site; ▪ Be fully conversant with the conditions of the EA, EMPr and all other environmentally-related licences and permits; ▪ Ensure the EA, approved EMPr and all other relevant licences and permits are in the tender documentation issued to prospective Contractors; ▪ Request for, review and approve the method statements prepared by the Contractor; ▪ Review and comment on environmental assessments and / or reports produced by the Contractor and ECO; ▪ Undertake regular site visits and ensure environmental specifications are implemented; ▪ Monitor compliance with the requirements of the specification; ▪ Assess the Contractor's environmental performance in consultation with the ECO from which a brief monthly report of environmental performance is drawn up for record purposes and to be reported on within project meetings; and Ensure the documentation, in conjunction with the Contractor, the state of the site prior to construction activities commencing. This documentation will be in the form of photographs or video record.
The Contractor (Sub-Contractors, Service Providers and Suppliers)	▪ Be fully conversant with the EMPr; ▪ Provide information on previous environmental management experience and company environmental policy in terms of the relevant forms contained in the Contract Document. ▪ Supply method statements timeously for all activities requiring special attention as specified and / or requested by the Project Manager, Environmental Officer and/or Engineer during the duration of the Contract. ▪ Be conversant with the requirements of this environmental specification/ EMPr. Brief all his/ her staff about the requirements of the environmental specification; ▪ Comply with requirements of the Environmental Officer in terms of this specification and the project specification, as applicable, within the time period specified. ▪ Ensure any Sub-Contractors/Suppliers who are utilized within the context of the contract comply with the environmental requirements of the project, in terms of the specifications. The Contractor will be held responsible for non-compliance on their behalf. ▪ Bear the cost of any delays, with no extension of time granted, should he or his Sub-Contractors / Suppliers contravene the said specifications such that the Engineer

	orders a suspension of work. The suspension will be enforced until such time as the offending party, procedure, or equipment is corrected. - Bear the costs of any damages / compensation resulting from non-adherence to the said specifications or written site instructions. - Comply with all applicable legislation. - Ensure that he informs the Engineer timeously of any foreseeable activities which will require input from the Environmental Officer. - The Contractor will conduct all activities in a manner that minimizes disturbance to the natural environment as well as directly affected residents and the public in general.
Environmental Control Officer (ECO)	- Be aware of the findings and conclusions of all EA related to the development; - Be familiar with the recommendations and mitigation measures of this EMPr; - Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them; - Undertake regular and comprehensive site inspections and monitoring of the construction site according to the EMPr and applicable licenses in order to monitor compliance as required; - Educate the construction team about the management measures contained in the EMPr and environmental licenses; - Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective; - Monitoring the performance of the Contractors and ensuring compliance with the EMPr and associated Method Statements; - Recommend corrective action for any environmental non-compliance at the site; Compile a monthly report highlighting any non-compliance issues as well as progress and compliance with the EMPr prescriptions. These monthly reports are to be submitted to the Client and the PM; - Conduct once-off training with the Contractor on the EMPr and general environmental awareness; - In case of non-compliances, the ECO must first communicate this to the Senior Site Supervisor, who has the power to ensure this matter is addressed. Should no action or insufficient action be taken, the ECO may report this matter to the authorities as non-compliance; - Maintenance, update and review of the EMPr; - Communication of all modifications to the EMPr to the relevant stakeholders. It must be noted that the responsibility of the ECO is to monitor compliance and give advice on the implementation of the EMPr and not to enforce compliance. Ensuring compliance is the responsibility of the PM and the ESO.
Environmental Site Officer (ESO)	- Be fully conversant and assist the Contractor in complying with the EA, approved EMPr and all other relevant licences and permits; - Be fully conversant with all relevant environmental legislation applicable to the project, and ensure compliance with them; - Compile environmental method statements on behalf of the Contractor that will specify how potential environmental impacts will be managed in line with the requirements of the EA, approved EMPr and other relevant licences and permits and where relevant environmental best practice, and how they will practically ensure that the objectives of the EMPr are achieved; - Convey the contents of the EA, approved EMPr and other relevant licences and permits to the Contractor, sub-contractors and suppliers. Ensure all relevant information is relayed to construction site-staff in a manner that is easily understandable; - Undertake daily and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EA, approved EMPr and other relevant licences and permits; - Take appropriate action if the specifications contained in the EA, approved EMPr and other relevant licences and permits are not followed. This must include reporting

	transgressions to the Project Manager, Engineer and Contractor, and may include the recommendation for penalties to be imposed on the Contractor; - Monitor and verify that environmental impacts are kept to a minimum, as far as possible; - Ensuring that the Written Warning Notification and Incidents Register is available on request; and - Maintain an environmental register which keeps a record of all incidents which occur on the site during construction.

Table 3.1: Detailed duties of various personnel.

3.2 COMPLIANCE MONITORING & AUDITING

An independent, external ECO must audit the construction site during the construction phase of the project on a monthly basis, unless specified otherwise by the Competent Authority (EDTEA). The monthly construction Environmental Audit Report is to be drafted by the ECO and submitted to the Applicant / Employer for review and implementation prior to the following site audit. Furthermore, the relevant party (ECO or Applicant) has the responsibility to submit the site audit report to the EDTEA: Compliance, Monitoring and Enforcement for the duration of the construction period.

The ECO's monthly monitoring report will be circulated to the Project Manager and filed in the EMPr file. At a minimum the monthly report is to cover the following:

- Weekly Environmental Checklists;
- Deviations and non-compliances with the checklists;
- Non-compliances issued;
- Completed and reported corrective actions;
- Environmental Monitoring;
- General environmental findings and actions; and
- Minutes of the Fortnightly Environmental Site Meetings.

In alignment with the National Environmental Management Act (NEMA), an independent, and adequately qualified person is to be appointed as the ECO to oversee the development, in order to ensure environmental compliance during the construction phases. It is important to note that the developer and/or authorisation holder is to ensure the appointment of an ECO at least one month prior to the commencement of construction.

The EMPr specifies the minimum requirements to be implemented by the Applicant as per the scope of works and of the EMPr. The EMPr seeks to minimise and manage the potential

environmental impacts and ensure sound environmental management practices. It is essential that the requirements of the EMPr be carefully studied, understood and implemented, and adhered to at all time.

To simplify the EMPr requirements, each aspect related to the EMPr has been addressed in the implementation and monitoring programme. Each action within the EMPr is supported by the priority of when the specific action needs to be implemented, monitored and the responsible persons.

3.3 NON-COMPLIANCE & FINES

The contractor shall comply with the environmental specifications and requirements on an on-going basis. Should the ECO find that the contractor is not in compliance, the ECO shall report and discuss the issue with the Project Manager, who if in agreement with the ECO, will issue an instruction to the contractor to fix the issue.

In the case of non-compliance giving rise to physical environmental damage or destruction, the Project Manager, in consultation with the ECO and the eThekwini Municipality: Environmental Planning and Climate Protection Department (EPCPD), shall be entitled to undertake, or cause to be undertaken, such remedial works as may be required to make good such damage and to recover from the contractor the full costs incurred in doing so. All parties, however, must be mindful of the fact that any remedial work may trigger a separate Listed Activity not included in the initial application for an Environmental Authorisation and therefore may require its own separate environmental assessment prior to implementation.

In the event of a dispute or difference of opinion between any parties arising out of the interpretation of the conditions of the EMPr, or a disagreement regarding the implementation or method of implementation of conditions of the EMPr, the Project Manager will act as the arbitrator, unless the Project Manager feels the need to seek specialist advice. The Project Manager shall at all times have the right to stop work and/or certain activities on site in the case of non-compliance or failure to implement remediation measures.

All contractors should not commence work unless they have signed an undertaking that makes the contractor responsible for payment of penalties and remedial action on any transgressions of the Environmental Authorisation or EMPr undertaken during the construction phase. All transgressors should be entitled to one verbal warning given the level of severity of the

transgression. Thus, those contractors who impact upon the environment in a limited manner should be warned, after review of the impacts by the ECO and:

• Remedial action to be taken by contractors if environmental damage arises in any construction activity; and

• Remedial action and financial penalties to be employed by the applicant on the contractor for any further transgressions.

Penalties should thus be set at the following levels:

IMPACT	PENALTY
Level 1 Low impact	Verbal warning
Level 2 Moderate impacts as indicated by ECO	Fine not exceeding R20 000.00
Level 3 Severe impact as indicated by ECO	Fine not exceeding R100 000. 00

All fines/ penalties to be paid to the Applicant. The Project Manager/ ECO must ensure payment has been made by the transgressor. The services of an independent specialist can be called upon should a dispute arise over the level of severity. The specialist's decision shall be final. Should payments not be made, the ECO may call upon the Department of Economic Development Tourism and Environmental Affairs to intercede on the matter.

3.3 TRANSGRESSIONS

The contractor is deemed not to have complied with this EMPr if:

- Within the boundaries of the site, site extensions and haul/access roads there is evidence of contravention of the EMPr;
- Environmental damage follows due to negligence on the contractor's and/or his/her sub contractor's part;
- The contractor and/or his/her sub-contractor fail to comply with the corrective or other instructions issued by the Project Manager within a specific time; and
- The contractor and/or his/her sub-contractor fail to respond adequately to complaints from the public.

3.4 ENVIRONMENTAL AWARENESS TRAINING

The contractor shall ensure that adequate environmental awareness training of senior site personnel takes place and that all construction workers receive an induction presentation on the importance and implications of the EMPr and Conditions of the EA. The presentation shall be conducted, as far as possible, in the employees' language of choice.

As a minimum, training shall include:

- Explanation of the importance of complying with the EMPr;
- Discussion of the potential environmental impacts of, and environmental risks presented by, construction activities;
- Employees' roles and responsibilities, including emergency preparedness;
- Explanation of the mitigation measures that must be implemented when carrying out their activities;
- Explanation of the specifics of this EMPr; and
- Explanation of the management structure of individuals responsible for matters pertaining to the EMPr.

The contractor shall keep records of all environmental training sessions, including names, dates and the information presented. These records will be presented to EDTEA and the ECO on request during audits.

4 SPECIALIST STUDIES

4.1 GEOTECHNICAL STUDY

Davies Lynn and Partners (Pty) Ltd (DLP) were appointed by eThekwini Municipality Water and Sanitation to undertake a geotechnical investigation for the proposed new 9.2km 300mm diameter continuously welded steel pipeline from Ofudu to Inwabi Reservoirs. A site reconnaissance was undertaken from the 26th to 28th July 2021.The report is attached in the annexures as well as the details of the specialist.

4.1.1 GEOTECHNICAL RECOMMENDATIONS

The Inspection Pits excavated along the pipeline route by Hand and extended to 2.5m by Hand Auger encountered materials that are predominantly classified as Intermediate to Hard excavation (Ie to He) in terms of SANS 1200D, within a depth range of approximately 0.0m up to 2.4m below existing ground levels (approximately 80% of the proposed route alignment will encounter Intermediate to Hard excavations within a depth 2.5m below existing ground levels). However, Soft Excavation (Se) to a depth of at least approximately 1.5m below existing ground levels is anticipated for approximately 50% of the proposed pipeline route.

In general, it has been noted that the site is predominantly dominated by relatively shallow bedrock conditions with a relatively thin overlying soil profile (approximately 80% of the proposed pipeline route). The bedrock generally consists of siltstones and fine to medium-grained sandstones (western and central sections) and massive granites (eastern sections) indicative of intermediate to hard excavation classes (Ie to He) for the majority percentage of the route.

Significant portions of the route comprise relatively shallow colluvial and residual soils overlying weathered very soft to hard bedrock and/or large boulders in the areas underlain by sandstone bedrock. In these locations hard excavation class is anticipated below approximately 0.0m to 2.4m depth. Along portions of the route where loose sandy soils and / or potentially unstable boulder horizons are encountered to depths of 1.5m and greater, trench sidewalls may require to be shored or battered back to 1 vertical in 1½ horizontal to maintain stability of the sidewalls during excavation.

Additionally, soil samples taken from IP1, IP6 and IP10 (SS1, SS4 and SS5) indicate that the existing colluvial material in these areas is most suitable for re-use as general backfill. If the quantity of colluvial material proves to be insufficient for re-use as general backfill along the

entire pipeline route, it is recommended that suitable granular material for use as “bedding” material be sourced from recognized local quarries.

The founding materials should comprise undisturbed in-situ materials. All fill material must therefore be removed from the base of the excavations. The bottom of the excavation should always be free from standing water. Where this is not possible, it will be necessary to stabilize the trench bottom and to avoid disturbance and further softening of the founding materials. This may be achieved by placing suitable granular material, crushed stone, and crusher run or concrete on the excavation base immediately excavation has been completed. Where compressible subsoils are encountered, it is recommended that the depth of the excavation be increased below the particular unsuitable founding horizon to a level where competent soils and/or bedrock occur subject to approval by the Engineer. A requirement for founding of the thrust and anchor blocks is to ensure excavations are taken through all disturbed materials and creep zones to key adequately (150 to 200mm) into competent weathered bedrock.

It is likely that unsuitable materials will be encountered at various points along the pipeline route as confirmed by the laboratory results. These are most likely to comprise deeply weathered, residual Sandstone and Granite materials characterized by variable proportions of particularly soft, incompetent materials (including unforeseen organic and fill materials at isolated locations). If such materials are encountered at trench level, the unsuitable materials should be removed and replaced with 19mm stone, wrapped on all sides with geofabric. A bedding cradle should be emplaced evenly on top of the 19mm stone on which would rest the pipe surrounded by its bedding blanket.

Although no surface / near surface water was encountered along the pipeline route, at the time of the geotechnical investigation, should trench excavations intercept subsurface water, or crosses valley axes, etc. pipes should be installed as cross-drains beneath the excavation to divert any natural active drainage line. Temporary cut-off ditches or stone-filled drains could be efficiently constructed in these areas. Alternatively, where this is not possible, pumping operations from a local sump will be required.

All construction activities need to be carried out in accordance with SANS 1200. Allowance should be made for suitable dewatering of excavations to engineers’ detail in areas where there is a high risk of frequent soil saturation. Special measures are to be considered necessary at any proposed drainage course crossing and road crossings.

4.2 VEGETATION ASSESSMENT

The proposed project involves the clearing of vegetation to make way for trenches that will contain the pipeline for the sewer reticulation. A vegetation impact assessment was crucial for the proposed project. A field visit was conducted on the 6th of August 2020 to ground-truth the proposed construction footprint and confirm the present vegetation assemblages which exist within this area. The report is attached in the annexures as well as the specialist details.

4.2.1 VEGETATION ASSESSMENT RECOMMENDATIONS

The study area was considered highly modified and transformed to such an extent whereby little to no natural vegetation exists within the study area (with exception of gardens and roadsides). The proposed development area falls within one (1) vegetation unit, namely KwaZulu-Natal Coastal Belt (CB 3) which is classified as endangered, with approximately 50% of the original extent having already been transformed. Based on the outcome of this assessment, there are no evident fatal flaws that would prevent this development from being authorised, nor being conducted in a sustainable manner.

However, if any protected plant species are found during the construction phase of the development, they must first be protected and the correct procedure followed. Should destruction / removal be an unavoidable option, then the prescribed process must be followed. All areas earmarked to be cleared, must be adequately staked and inspected by the ECO to ensure that no vegetation has been overlooked. Unnecessary vegetation clearance must be prohibited and indigenous vegetation must remain intact where and for as long as possible (erosion reduction, maintain habitat and surface roughness). It is recommended that the pipeline route is installed along previous disturbed routes and pathways where practically possible. The Installation of the pipeline within close proximity to the watercourse should be done using labour intensive methodology where practically possible as opposed to large plant (excavators and TLBs) to limit the construction footprint within the any watercourse system. Furthermore, where practically possible the design engineer should investigate horizontal drilling and/or the use of a pipeline pier when crossing any watercourse.

The identified impacts on the specialist studies summarised above, will be incorporated into the Environmental Management Programme (EMPr) and assigned mitigation measures and responsible personnel. The EMPr will assist the Environmental Control Officer (ECO) to effectively identify and execute mitigation measures against any pre-determined impact, as well as in cases of emergencies.

5 METHOD STATEMENTS

Method Statements are written submissions by the contractor to the ECO in response to the requirements of the EMPr, or to a request by the ECO. The contractor shall be required to prepare Method Statements for several specific construction activities and/or environmental management aspects. The contractor shall not commence the activity for which a Method Statement is required until the ECO has approved the relevant Method Statement. Method Statements must be submitted to the ECO at least 10 working days prior to the date on which approval is required. The ECO must in turn accept or reject the Method Statement within 5 working days of receiving the Method Statement.

Failure to submit a Method Statement may result in suspension of the activity concerned until such time a Method Statement has been submitted and approved. An accepted Method Statement shall not absolve the contractor from any of the obligations or responsibilities in terms of the contract. However, any damage caused to the environment through activities undertaken without an approved Method Statement shall be rehabilitated at the contractor's expense.

The Method Statements shall cover relevant details with regard to:

- Construction procedures and location of the construction site;
- Start date and duration of the procedure;
- Materials, equipment and labour to be used;
- Storage, removal and subsequent handling of all materials, excess materials and waste materials of the procedure;
- Emergency procedures in case of any reasonably potential accident/incident which would occur during the procedure; and
- Compliance/non-compliance with the EMPr specification and motivation if non-compliant.

5.1 REQUIRED METHOD STATEMENTS (MS)

Based on the identified impacts, the following Method Statements (MS) are required as a minimum:

MS1: Traffic accommodation

MS2: Site and Vegetation Rehabilitation Plan

MS3: Alien Vegetation Control Programme

MS4: Stormwater control

MS5: Wastewater control system

MS6: Cement / concrete batching

MS7: Solid waste control system

MS8: Hazardous substances

MS9: Fire control and emergency procedures

MS10: Post-construction Monitoring Programme

SECTION 2 – IMPLEMENTATION & MONITORING PLAN

PRE-CONSTRUCTION				
Objective	Management Actions	Management Outcomes	Monitoring	
			Responsibility	Frequency
Compliance with environmental legislation and policy	▪ All relevant legislation and policies must be consulted and the Applicant is to ensure that the project is compliant. – Failure to comply with existing policies and / or legislation could lead to the project failure or delays and undue disturbance to the natural environment. ▪ Environmental training / toolbox talks must be held to ensure all construction personnel are aware of the provisions contained in the EMPr.	▪ Avoid conflict with local, provincial and national policies and legislation. ▪ Ensure environmental awareness amongst employees.	**Implementation**: Contractor **Inspection**: ESO / HSE **Verification**: ECO	**Implementation**: Ongoing and during rehabilitation **Inspection**: Ad hoc and weekly as a minimum. **Verification**: Monthly
Site establishment	▪ Authorization should be solicited from the Municipality, prior to assuming site; ▪ Should topsoil and grass be evident on site, it is to be removed during the establishment of the construction camp and is to be stockpiled and demarcated; ▪ Should trees be located within the footprint of the construction camp, they are to be demarcated. Should the tree species be indigenous, they are not to be removed / cut down unless replaced with two specimens of the same species. Alien plant species / trees are to be removed; ▪ The site camp is to be fenced and have restricted, gated access; ▪ Storage areas should be properly fenced off; ▪ No material is to be stored beyond the boundaries of the site camp; ▪ A sign is to be erected at the site camp to provide adequate details of the construction project and contractor, and emergency contact details (if required); and ▪ Before and after photos are to be taken of the driveways / walkways / roads to be impacted upon during development.	▪ Limit impact on the receiving environment. ▪ Ensure materials are available for the rehabilitation of the construction camp.	**Implementation**: Contractor **Inspection**: ESO / HSE **Verification**: ECO	**Implementation**: Ongoing and during rehabilitation **Inspection**: During Site Establishment **Verification**: Monthly

Environmental documentation	➢ The following documentation is, at a minimum, to be maintained in the on-site environmental file: ❖ Environmental Authorisation; ❖ EMPr; ❖ Community complaints register; ❖ Copies of the monthly ECO audit reports; ❖ Waste disposal waybills; ❖ Chemical toilet service slips; ❖ Environmental incidence register; ❖ Method Statements; ❖ Site-specific toolbox talks as signed by attendees.	➢ Ensure on-site employees undertake best environmental practice during the construction and rehabilitation phases.	**Implementation**: Contractor **Inspection**: ESO / HSE **Verification**: ECO	**Implementation**: Ongoing and during rehabilitation **Inspection**: During Site Establishment **Verification**: Monthly

Table 1: Pre-Construction Programme

CONSTRUCTION				
Objective	Management Actions	Management Outcomes	Monitoring	
			Responsibility	Frequency
Traffic management	▪ The Contractor must provide a Traffic Management Method Statement (MS1) clarifying how traffic will be managed and accommodated; ▪ Timeous notification must be given to surrounding landowners regarding the nature and timeframes for any traffic impacts; ▪ Employ flag personnel to regulate traffic; ▪ Warning signs must be erected indicating the presence of construction vehicles along the envisaged routes; ▪ Speed limits must be adhered to; ▪ Ensure that heavy / large load traffic is appropriately routed and appropriate safety precautions are taken to prohibit road collisions and traffic incidences; ▪ Ensure that vehicle operators are suitably licensed, have had appropriate environmental and safety induction, are aware of specific site procedures, and are well rested and cognisant when operating heavy or unsafe vehicles / machinery; ▪ Suitable construction sign boards must be clearly displayed in areas affected by the proposed project; and ▪ Only designated areas are to be utilised for loading/unloading/turning.	▪ The prevention / mitigation of the impedance of traffic. ▪ Ensuring public health and safety.	**Implementation**: Contractor **Inspection**: ESO / HSE **Verification**: ECO	**Implementation**: Daily and ad hoc **Inspection**: Ad hoc and weekly as a minimum. **Verification**: Monthly
Soil contamination	▪ Hazardous materials must be stored in a clearly marked, lockable, designated storage area; ▪ Potential hazardous substance must be stored on an impervious surface in a designated bunded area and be able to accommodate 110% of the total volume of material stored at any given time; ▪ When decanting hazardous substances, drip trays must be used; ▪ Decanting must not to take place within 32m of any watercourse; ▪ Should a spillage occur, absorbent material should be spread on areas where oil spills have occurred. The contaminated soil must be lifted and stored within a high-density plastic bag to be disposed of appropriately; ▪ Oil-contaminated soils must be removed to a contained storage area and disposed of at a licensed facility; ▪ All disturbed areas must be rehabilitated, using the stockpiled soil as required;	▪ Avoidance of soil loss. ▪ Re-use of viable soils in rehabilitation. ▪ Avoidance of disposal of hazardous waste.	**Implementation**: Contractor **Inspection**: ESO / HSE **Verification**: ECO	**Implementation**: Ongoing **Inspection**: During Site Establishment **Verification**: Monthly

	✚ The soil excavated from the trenches must be retained, and be returned in the reverse order to which it was removed so as to re-establish the original soil profiles as best possible; and ✚ Stockpiled topsoil must be covered during times of high wind to prevent dust.			
Biodiversity	✚ A site and vegetation rehabilitation statement (MS2) including the protection of indigenous floral species must be compiled for implementation; ✚ Only where necessary should any indigenous vegetation be disturbed or temporarily removed; and ✚ No animal, reptile or bird of any sort found on site may be killed.	✚ Prevention of the introduction and spread of alien invasive species in the area due to construction activities. ✚ Limiting loss of indigenous vegetation.	**Implementation**: Contractor **Inspection**: ESO / HSE **Verification**: ECO	**Implementation**: Ongoing and during rehabilitation **Inspection**: Ad hoc and weekly as a minimum **Verification**: Monthly
Vegetation	✚ A rigorous programme of alien weed control (MS3) must be implemented and sustained until the vegetation / grass cover over the trenches is well established; ✚ EThekwini Municipality can be contacted for assistance in eradicating alien plants, particularly Formosa Lily and Pom Pom Weed. Note the location of the plants (GPS coordinates if possible) and report the sighting online at http://www.durbaninvasives.org.za/ or contact Bheka Nxele on Bheka.Nxele@durban.gov.za ; ✚ Indigenous grass species suitable for the rehabilitation of the trenches are as follows: – Kweek grass: Cynodon dactylon – Buffalo Grass: Stenotaphrum secundatum – Bahia Grass: Paspalum notatum ✚ The above grasses are suitable in the coastal climate and are resistant to overgrazing by goats or other livestock. The remaining vegetation on the site is only to be removed immediately before construction commences to reduce the period of exposure to bare soil. Where vegetation has been removed, exposed soils must be re-vegetated as soon as possible with indigenous creeping / stoloniferous vegetation; and ✚ Vegetation is only to be cleared where required and the extent of the disturbed area must be minimised.	✚ Prevent the establishment of alien vegetation control. ✚ Ensure indigenous species establish on site.	**Implementation**: Contractor **Inspection**: ESO / HSE **Verification**: ECO	**Implementation**: Ongoing and during rehabilitation **Inspection**: Ad hoc and weekly as a minimum **Verification**: Monthly
Erosion control	✚ A Method Statement (MS4) is to be provided detailing how stormwater is to be controlled, and consequently how erosion is to be prevented and / or rehabilitated;	✚ Ensure suitable stormwater control to limit sedimentation of	**Implementation**: Contractor	**Implementation**: Ongoing and during

	✚ Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and working areas; ✚ The extent of earth works must be minimised and restricted to the required areas only. Flora may not be removed, damaged or destroyed unless necessary for carrying out the works; ✚ Should any remain, then vegetation and topsoil is to be cleared where site camp is proposed and utilised post construction for rehabilitation purposes; ✚ Disturbed areas must be immediately rehabilitated to prevent erosion; ✚ Bank slopes must be graded to the lowest possible angle and must be well below the slip angle of the soil at the site; ✚ Banks must be planted with indigenous grasses (refer to 'Vegetation' for recommended species); ✚ Where necessary use must be made of gabions, rock packs, or other such hard stabilising structures. However, the use of retaining walls constructed of bricks, blocks, or concrete, is not recommended as such structures are often ineffective and can even accelerate erosion processes in some cases; ✚ No surplus soil or other such material may be disposed of in the watercourses or drainage channels; ✚ Any hydrocarbon spills and or polluted loads identified within the construction footprint are to be removed immediately, together with the contaminated soil and disposed of in a dedicated, impermeable container; ✚ Berms / geotextiles are to be installed above and below cleared areas to capture surface run-off, promote infiltration and prevent siltation of the watercourses; ✚ Measures must be taken to manage storm water on exposed areas during high intensity rainfall events; and ✚ All areas impacted by earth-moving activities must be re-shaped post-construction to ensure the natural flow of runoff and to prevent ponding. All exposed earth must be rehabilitated promptly with suitable vegetation to stabilize the soil.	the watercourses and erosion.	**Inspection**: ESO / HSE **Verification**: ECO	rehabilitation **Inspection**: Ad hoc and weekly as a minimum **Verification**: Monthly
Surface and groundwater	✚ A Method Statement (MS5) is to be provided detailing how waste water is to be controlled, how spills are to be dealt with, who is to be contacted etc.; ✚ Contaminated water associated with construction activities must be contained in separate areas or receptacles such as Jo-Jo tanks or waterproof drums, and must not be allowed to enter the natural system;	✚ Prevent ponding and backwater effect of stormwater.	**Implementation**: Contractor **Inspection**: ESO / HSE **Verification**: ECO	**Implementation**: Ongoing and during rehabilitation

	➢ Training on site personnel regarding the correct handling of spills, as well as precautionary measures that need to be implemented to minimise potential spillages; ➢ Suitable ablution facilities must be provided for workers. These facilities must be regularly serviced to reduce the risk of surface or groundwater pollution. Workers are to be encouraged to use these facilities. All sanitary facilities are to be placed outside of 32m of the watercourse or outside of the 1/100 year floodline; ➢ No maintenance / servicing / washing of vehicles is to take place on site; ➢ All construction vehicles must be inspected regularly for oil leaks. Such leaks are to be repaired before further use of the vehicle and under no circumstances will said vehicles be allowed within a watercourse; ➢ Drip trays must be placed underneath all stationery plant; ➢ Drip trays must be used where fuel is transferred; ➢ All spillages must be cleaned in accordance with contractor's spill contingency procedure; ➢ Incidents related to the contamination of surface water must be communicated to eThekwini Municipality, EDTEA and the Department of Water and Sanitation; and ➢ Construction vehicles are to be monitored for hydrocarbon leakages daily. Any vehicles found to be leaking must not be permitted to drive within 32 of the watercourse until repaired.	➢ Any spills from construction are adequately remediated. ➢ Pollution prevention. ➢ Should the existing sewer/sewerage rising main be damaged during this operation, Musa Gumede of the eThekwini Municipality must be notified immediately.		**Inspection**: Ad hoc and weekly as a minimum **Verification**: Monthly
Cement / concrete mixing	➢ Cement and concrete batching, as per MS6, is to include details relating to the handling of concrete at the construction site and the spoiling of waste concrete and concrete washout. If the Contractor is not batching concrete but rather receiving ready mix, then the MS needs to address matters pertaining to the timing of deliveries, routing, and pedestrian safety; ➢ All concrete mixing must take place on a designated, impermeable surface. No cement runoff is to enter any watercourses or drainage lines, under any circumstance; ➢ No vehicles transporting concrete to the site may be washed on-site; and ➢ Runoff from concrete batching areas must be collected into a conservancy tank and disposed of by a registered service provider at the nearest hazardous landfill site or other landfill sites capable of dealing with waste of this nature.	➢ To prevent any contamination of the natural environment, especially the water resource when constructing stream crossing points	**Implementation**: Contractor **Inspection**: ESO / HSE **Verification**: ECO	**Implementation**: Ongoing and during rehabilitation **Inspection**: Ad hoc and weekly as a minimum **Verification**: Monthly

Waste management	✚ A Method Statement (MS7) is to be provided indicating how waste management practices are to be undertaken and implemented. MS7 is to include separation, storage, handling, transport, recycling, reduction, clean-up and disposal; ✚ Waste must be disposed of to a licenced landfill site; ✚ Designated skips/litter bins must be provided for hazardous and ✚ waste and must be kept in a bunded area in the construction camp; ✚ Waste receptacles are to be placed throughout the construction site; ✚ Spill kits must be made available for use wherever necessary; ✚ Should a spill occur, the contaminated soil is to be collected and removed immediately; ✚ Contaminated construction and maintenance waste must be removed to an appropriate registered waste disposal site; ✚ Refuse and litter must be removed from the construction footprint continuously; ✚ The recycling of waste should be practiced, with separate drums provided for paper and cardboard, glass, plastics, metals etc.; No litter, refuse, waste, rubbish, rubble, debris and builders waste generated on site may be placed, dumped or deposited on adjacent or surrounding properties including roads, verges, pedestrian walkways etc.; ✚ All solid waste generated on-site during construction processes must be placed in a designated waste collection area within the construction camp and must not be allowed to blow around the site or placed in piles adjacent the waste skips/bins; ✚ All construction/solid waste shall be disposed of off-site at a registered landfill site. Disposal certificates must be obtained and kept on site for the duration of the construction phase; ✚ Refuse bins are to be provided throughout the construction footprint; ✚ On completion of the project, the appointed contractor shall ensure that all waste rubble generated during construction is removed; and ✚ On completion of the project, the appointed contractor must ensure that all structures, equipment, materials, waste, rubble used during construction are removed. All construction waste must be disposed off-site at an approved landfill site.	✚ The prevention or the mitigation of the spread of waste and/or contamination.	**Implementation**: Contractor **Inspection**: ESO / HSE & ECO **Verification**: ECO	**Implementation**: Ongoing and during rehabilitation **Inspection**: Ad hoc and weekly as a minimum **Verification**: Monthly
Hazardous substances	✚ Hazardous substances and materials (MS8) are those that are potentially poisonous, flammable, carcinogenic or toxic. Examples of these include: diesel, petroleum, oil, bitumen, solvent based paints and lubricants. Such substances must be managed appropriately; ✚ A register of all hazardous substances relating to the project and stored at the construction camp site must be maintained;	✚ Ensure all hazardous substances is ✚ stored and handled in accordance with	**Implementation**: Contractor **Inspection**: ESO / HSE & ECO	**Implementation**: Ongoing and during rehabilitation

	➢ All hazardous substances are to be stored in a covered, lockable bunded area and handled in accordance with the relevant MSDS; ➢ Significant spills must be reported to the eThekwini Municipality, EDTEA & DWS as per legal requirements. Contamination assessments must follow significant spillage events to determine specific risks, impacts and mitigation actions; ➢ All hazardous waste must be carefully stored in appropriate hazardous waste receptacles and disposed of offsite at the licenced hazardous landfill site; and ➢ Should any existing infrastructure be damaged during this operation, the eThekwini Municipality must be notified immediately.	➢ the material safety data sheets ➢ (MSDS).	**Verification**: ECO	**Inspection**: Ad hoc and weekly as a minimum **Verification**: Monthly
Air quality and noise	➢ All machinery/plant must be serviced regularly to ensure good working order and prevent air and noise pollution; ➢ The appointed Contractor shall be familiar with and adhere to any local by-laws and regulations regarding the generation of noise and hours of operation. The contractor shall avoid construction activities outside of "normal working hours"; ➢ If possible, construction activities must be restricted to the hours of 08h00 to 17h00 to limit noise impacts to neighbouring communities; ➢ Any noise / dust complaints received from the community/surrounding businesses must be documented in a dedicated register (maintained at the construction camp) and responded to by the eThekwini Municipality (i.e. employer) who will identify the source and implement appropriate noise reduction management techniques; and ➢ All of the contractor's equipment must be fitted with effective exhaust silencers and must comply with the South African Bureau of Standards recommended code of practice and the SANS Code 0103:1983, for construction plant noise generation. Contractors' vehicles must be fitted with effective exhaust silencers and must comply with Road Traffic Act (Act 29 of 1989) when any such vehicle is operated on a public road.	➢ No fugitive dust exceeding the South African National Standard (SANS) regulations or creating nuisance conditions. ➢ No ambient noise impacts relating to plant operations. ➢ Compliance to municipal by-laws. ➢ Limited nuisance conditions created.	**Implementation**: Contractor **Inspection**: ESO / HSE & ECO **Verification**: ECO	**Implementation**: Monthly or at the prescribed vehicle/plant manufacturers' specifications. **Inspection**: Ad hoc and weekly as a minimum **Verification**: Monthly

Visual	▪ During construction, litter control measures must be kept in place to ensure the site is maintained in a neat and tidy condition; ▪ Should lighting be required it is to be erected in such a manner as to preclude the lighting from becoming intrusive; ▪ Screening of highly reflective material must be undertaken; and ▪ Housekeeping, particularly within the construction camp, must be continuously maintained.	▪ The prevention or the mitigation of unsightliness.	**Implementation**: Contractor **Inspection**: ESO / HSE & ECO **Verification**: ECO	**Implementation**: Ad hoc and daily **Inspection**: Ad hoc and daily **Verification**: Monthly
Cultural environment	▪ Amafa aKwaZulu-Natali's standard conditions are applicable to the site: ▪ Any archaeological, paleontological and related artefacts or features that are found must be reported to Amafa aKwaZulu-Natali or a qualified archaeologist for comment; ▪ Sighting of fossil material must be reported to the HIA specialist; ▪ The Engineer is to be informed of the find immediately and work in the immediate vicinity must be stopped; and ▪ Work may only resume once clearance is given in writing by Amafa aKwaZulu-Natali.	▪ The prevention or the mitigation of the loss of heritage artefacts.	**Implementation**: Contractor **Inspection**: ESO / HSE & ECO **Verification**: ECO	**Implementation**: Ad hoc and daily **Inspection**: Ad hoc and weekly as a minimum **Verification**: Monthly
Material handling and storage	▪ Areas for temporary stockpiling of excavated and imported material and other construction material shall be agreed to by the Residential Engineer (RE) and ECO; ▪ Any hazardous or dangerous goods utilised during construction must be stored on an impermeable surface that is bunded, fenced, locked and covered; ▪ Drip tray shall be provided for stationery plants; ▪ Any accidental leak / spilling of hydrocarbons is to be reported to the RE or ECO immediately so that remediation methods can be quickly implemented.	▪ Prevent impacts to and contamination of the receiving environment.	**Implementation**: Contractor **Inspection**: ESO / HSE & ECO **Verification**: ECO	**Implementation**: Ad hoc and daily **Inspection**: Ad hoc and weekly as a minimum **Verification**: Monthly
Socio-economic	▪ Inform the surrounding communities and public of the proposed activity as soon as possible. This will serve to ease potential social anxiety. It is advised that the Applicant notify residents via letter drops / pamphlets or via community meetings; ▪ Provide clear and realistic information regarding employment opportunities and other benefits to prevent unrealistic expectations; ▪ Make use of local labour, material, goods and services as far as possible; ▪ Training of labourers to benefit individuals beyond completion of the project; and ▪ Monitor complaints by the general public.	▪ Clear notification of and ▪ communication with the surrounding community	**Implementation**: Contractor **Inspection**: ESO / HSE & ECO **Verification**: ECO	**Implementation**: Ad hoc and daily **Inspection**: Ad hoc and weekly as a minimum **Verification**: Monthly

General	➢ Provide warning signs, danger tape and shade cloth to delineate the working area; ➢ Care must be taken to ensure any bulky or dangerous materials are secured when transporting them along the road / pedestrian walkways. No residents / pedestrians are to be in close proximity to the material when being transported, in the instance that materials are dislodged; ➢ The appropriate contractor's safety procedures and Personal Protective Equipment (PPE) must be used at all times by workers and visitors to the site; ➢ Ensure that a First Aid kit is available on site; ➢ In the event of an emergency, the contractor's emergency procedure must be followed and the relevant emergency services must be contacted; ➢ Excavated trenches are to remain open for as short a duration as possible; ➢ All excavations are to be cordoned off and safety signage is to be established; ➢ Implement good housekeeping practices at the construction camp; ➢ Construction workers / construction vehicles must take heed of normal road safety regulations; thus all personnel must obey and respect the law of the road. A courteous and respectful driving manner should be enforced and maintained so as not to cause harm to any individual; ➢ Cordon off the construction site and construction camp. If possible, a security guard or night watchman is to be placed on site; ➢ Care is to be taken to ensure that any bulky or dangerous materials are secured when transporting; ➢ A fire control and emergency procedure method statement (MS9) is to be developed for the site; ➢ No fires are permitted on site. Fire extinguishers are required; ➢ Control traffic and pedestrian movement in the vicinity of construction, should it be required; ➢ Suitable fire fighting equipment shall be stored and easily accessible at the site camp; and ➢ In the event of a fire, the appropriate fire management system, (and implementation of the MSDS should hazardous materials be involved) and onsite emergency response plan, must be implemented.	➢ Provide a safe and efficient system for all vehicles, pedestrian and workmen. ➢ Proactive measure to prevent accidents. ➢ Ensure the safety of the community and workers alike.	**Implementation**: Contractor **Inspection**: ESO / HSE & ECO **Verification**: ECO	**Implementation**: Ad hoc and daily **Inspection**: Ad hoc and weekly as a minimum **Verification**: Monthly

Table 2: Construction Programme

POST CONSTRUCTION				
Objective	Management Actions	Management Outcomes	Monitoring	
			Responsibility	Frequency
Post Construction & Rehabilitation of the site	✚ On completion of the project, the appointed contractor must ensure that all structures, equipment, materials, waste, rubble, notice boards and temporary fences used during construction are removed; ✚ All construction waste / debris must be removed from within the construction footprint and disposed off-site at an approved landfill site; ✚ Should any indigenous vegetation be required to be removed, it will be replaced by two specimens of the same species; ✚ All plants removed during construction must be replanted in the same location they were removed from. Should plants have been damaged, they are to be replaced like-for-like in terms of species; ✚ A 6 month post-construction monitoring programme (MS10) must be set in place and must include the following: ❖ Rehabilitation of the pipeline trenches ❖ Rehabilitation of the working servitude ❖ Reinstatement of driveways and walkways ❖ Soil erosion ❖ Alien weed invasion ❖ Leaks from the new pipeline	✚ Rehabilitated construction camp	**Implementation**: Contractor **Inspection**: ESO & ECO **Verification**: ECO	**Implementation**: Post Construction **Inspection**: During rehabilitation period **Verification**: Monthly

Table 3: Post Construction/Rehabilitation and Monitoring Programme

SECTION 3 – RECORDS

3.1 TRAINING REGISTER

Date of Training	Name of Attendee	Company Name	Details of Training Course i.e.: Environmental Induction, Safety etc.	Signature of attendee	Training Provided by (Company Name, Contact Person & Details)

3.2 COMPLAINTS REGISTER

Date Of Complaint	Complainant's Name	Contact Details	Nature Of Complaint (Environmental, Noise, Safety, Earth Works Etc.)	Corrective Action Taken	Date Of Corrective Action Completion	Name Of Person Taking Complaint And, Date & Time Of The Lodged Complain

3.3 INCIDENT & RESPONSE REGISTER

Date Of Incident	Details Of Incident	Parties Responsible	Corrective Action Taken	Date Of Corrective Action Completed