ENVIROPRO

IN ASSOCIATION WITH INKANYEZI YETHU

SEPTEMBER 2022

DRAFT BASIC ASSESSMENT REPORT

THE NTAMBANANA WATER SUPPLY SCHEME –THE INFILL AND EXCAVATION WITHIN WATERCOURSES FOR THE CONSTRUCTION PIPELINES AND BULK WATER INFRASTRUCTURE

UMHLATHUZE LOCAL MUNICIPALITY

KING CETHWAYO DISTRICT MUNICIPALITY

EIA REF NO: DC28/0011/2022 **EVP1472**

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SECTION 1 INTRODUCTION, PROJECT AND SITE DESCRIPTION

1.1. Background

The City of uMhlathuze proposes upgrading the existing Ntambanana Water Supply Scheme (WSS) within the Ntambanana Water Supply Area (Upper Nseleni area and specifically the Ntambanana, Obizo and Macekane areas), within Wards 24, 31, 32 and 33 of the uMthlatuze Local Municipality.

The new WSS infrastructure planned for the scheme includes the following:

- 79.8km of bulk water pipelines between 110mm dia – 450mm to supply the 12 reservoirs in the system, 8 of which will be new,
- The Installation of pump stations,
- The construction of 8 reservoirs,
- Pipe reticulation of approximately 395km with metered connections[1].

The Ntambanana WSS was designed with an updated design philosophy where the topography of the areas within the scheme were divided into specific reservoir supply zones. The pipeline network will cross 63 watercourses where more than $10m^3$ of material will be infilled or removed.

The water source supplying this scheme will come from Empangeni Town's Hillview Reservoir which has capacity (currently 7.2 Mℓ/d) to supply the Ntambanana WSS. The Ntambanana WSS will have a water demand of 3Mℓ/d.

1.2. Scope of Work

Prepare a site specific EMPr for the construction of The Ntambanana Water Supply Schemein order to manage and mitigate potential environmental impacts during construction. The provisions of this EMPr are binding on the contractor throughout the life of the contract.

1.3. General Principles and Purpose of This EMPr

The purpose of this EMPr is to provide guidance to all contractors and site workers on how to operate in a responsible manner to achieve these goals and ensure that the requirements of the legislation are met. This EMPr is a working document to be used during construction and has been generated to ensure that:

- The protection of the environment during the construction period.
- All emissions to air water and soil are controlled and managed to mitigate their impacts on the environment and surrounding communities.
- Nuisance factors associated with construction are controlled as far as is reasonably possible.
- The correct principles are followed from the very beginning during site set up thereby reducing frustrations on the part of the contractor when asked to comply with the strictures of the EMPr and relevant environmental legislation.
- The post construction clean-up is carried out correctly so as to avoid environmental impacts and meet the legislated requirements.

[1] Upgrade Of Water Supply Infrastructure for Ntambanana Supply Area (Upper Nseleni Supply) Feasibility Report (Rev 1) March 2022. Civtech Engineers.

This EMPr is subject to change as brought about by variations in the project specification and any changes must be approved by the relevant authorities.

1.4. Responsibilities

The Project Applicant (The uMhlatuze Local Municipality) is responsible for:

- Ensuring that the engineer and contractors comply with the approved EMPr.
- Ensuring compliance with the provisions for duty of care and remediation of damage in accordance with section 28 of the National Environmental Management Act (NEMA), (No. 107 of 1998) and its obligations regarding the control of emergency incidents in terms of Section 30 of NEMA.
- Notifying the relevant authorities (EDTEA) of any incident as defined in subsection 30(1) (a) of NEMA.
- Ensuring that the mitigation measures to address environmental impacts identified are carried out by the contractor.

The Project Manager or Engineer (Civtech) is responsible for:

- Appointing a qualified contractor and ensuring that they have read and understood the EMPr.
- Ensuring all work undertaken is in accordance with the EMPr.
- Ensuring adherence to safety, health and environment (SHE) standards and ensuring the construction activities comply with the EMPr.
- Arranging for the site to be monitored on a daily basis to ensure compliance with the EMPr.
- Overall responsibility and accountability for the site during the construction phase.
- Mitigating impact on the environment through responsible operation and adherence to the EMPr.
- Ensuring transparency in their operation and environmental management of the site.
- Managing the contractor to ensure that they adhere to the EMPr and ensuring that all necessary documentation is maintained on site.
- Ensuring that the contractor has a copy of the EMPr and Method Statements.

The Site Contractor(s) is/are responsible for:

- Providing a suitable person to operate as Environmental Officer (EO) to undertake the monitoring of the day-to-day requirements of the EMPr.
- Operating in accordance with the EMPr and carrying out construction activities with due care and diligence.
- Ensuring that any communications from stakeholders are reported to the Environmental Control Officer (ECO).
- Maintaining relevant documentation for review by the ECO.
- Undertaking the mitigation measures to address environmental impacts identified.

The Environmental Officer (EO) or designated Safety Health Environment (SHE) officer is responsible for:

- Daily compliance monitoring of construction against the requirements set out in this EMPr, and the environmental authorization.
- Undertaking the mitigation measures to address environmental impacts identified.
- Ensuring that all site staff are adequately trained in environmental matters.
- Liaising with site staff and I&APs through the Community Liaison Officer (CLO), if required.
- Must be conversant with the applicable legislation pertaining to the environment.
- Liaise directly with the ECO on the monthly audit findings.

- Identification of possible areas of improvement during construction.
- Monitoring the construction site on a regular basis and recording key findings.
- Advising the Project Manager and the contractors on environmental matters.
- Provide recommendations to address and rectify these matters.
- Monitoring implementation of the EMPr by the contractor.
- Work hand in hand with the health and safety officer.
- Maintain records pertinent to the requirements of the EMPr.

The Environmental Control Officer (ECO or Independent environment practitioner) is responsible for:

- Conducting regular auditing against the requirements of the EMPr and Environmental Authorization.
- Liaising directly with the EDTEA and supplying them with copies of the audit reports.
- Liaising directly with the contractor and EO and supplying them with a copy of the audit reports.

1.5. Monitoring

The key to a successful EMPr is effective monitoring and review to ensure effective functioning of the EMPr and to identify and implement corrective measures in a timely manner. The EO must be responsible for day-to-day monitoring and reporting while the ECO must undertake to monitor the site on a monthly basis. The day-to-day monitoring must be conducted by the EO in conjunction with the contractor and the engineer. The monthly audit report by the ECO can then be used to provide external monitoring and reporting to EDTEA Compliance and Enforcement. Paramount to the reporting of non-conformances or incidents is that corrective and preventive action plans are developed and adhered to. Photographic records of all incidents and/ or non-conformances must be retained. Non-compliances identified by the ECO must be resolved within fourteen days of being noted, incidents that are deemed by the ECO to have a large environmental impact must be resolved immediately.

1.6. Applicable Legislation

The site engineer must be aware of any compliance issues raised by the EO and ECO and must ensure that the necessary corrective measures are implemented. As per the National Environmental Management Act No 107 of 1998 (Section 28), offending parties may be held financially accountable for any pollution or environmental damage.

The following environmental legislation must be adhered to:

- Constitution of South Africa (Act No. 108 of 1996)
- National Environmental Management Act (Act No 107 of 1998) – NEMA
- Environment Conservation Act (Act No 73 of 1989)
- National Heritage Resources Act (Act No 25 of 1999)
- National Water Act (Act No 36 of 1998)
- Hazardous Substances Act (Act No. 15 of 1973)
- National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
- Occupational Health and Safety Act (Act No 85 of 1993)
- National Environmental Management: Waste Management Act (Act No. 59 of 2008)
- National Building Regulations and Building Standards Act 103 of 1977
- Relevant local bylaws

This EMPr meets the requirements of the stipulations provided in Appendix 4 of NEMA, 1998 (Act No. 107 of 1998) Environmental Impact Assessment Regulations, 2014 with regards to the content of EMPr. This EMPr has been developed to specifically address the impacts related to this project in each phase of development.

1.7. Layout of the EMPr

The EMPr is divided into five sections dealing with an Introduction and description of the proposal and the site, Pre Construction and Site Set Up, Construction Activities and Post Construction, Rehabilitation and Operation Activities. Sections 4 and 5 provide definitions and records that can be used to record training, incidents, and complaints. Under the construction section, each section deals with a specific aspect of the development i.e. administration and records. Within these sections, the specific activity is described and the mitigation action required is provided. The tables have been set up to enable ease of auditing with a section for the EO/SHE officer or ECO to state whether mitigation measures have been put in place and to make comment about any problems noted.

1.8. Project Details

The City of uMhlathuze proposes upgrading the existing Ntambanana Water Supply Scheme (WSS) within the Ntambanana Water Supply Area (Upper Nseleni area and specifically the Ntambanana, Obizo and Macekane areas), within Wards 24, 31, 32 and 33 of the uMthlatuze Local Municipality.

The new WSS infrastructure planned for the scheme includes the following:

- 79.8km of bulk water pipelines between 110mm – 450mm diameter to supply specific reservoirs,
- The Installation of pump stations,
- The construction of 8 reservoirs, and
- Smaller (narrow) pipe reticulation of approximately 395km with metered connections to households[2].

The project area was previously served by King Cetshwayo District Municipality which is a Water Service Authority (WSA). A large section of the WSS falls within Ntambanana Local Municipality. The Ntambanana Local Municipality was dissolved in September 2012 and absolved by City of uMhlathuze which is also a WSA. Historically, this area has faced a number of water supply challenges, namely:

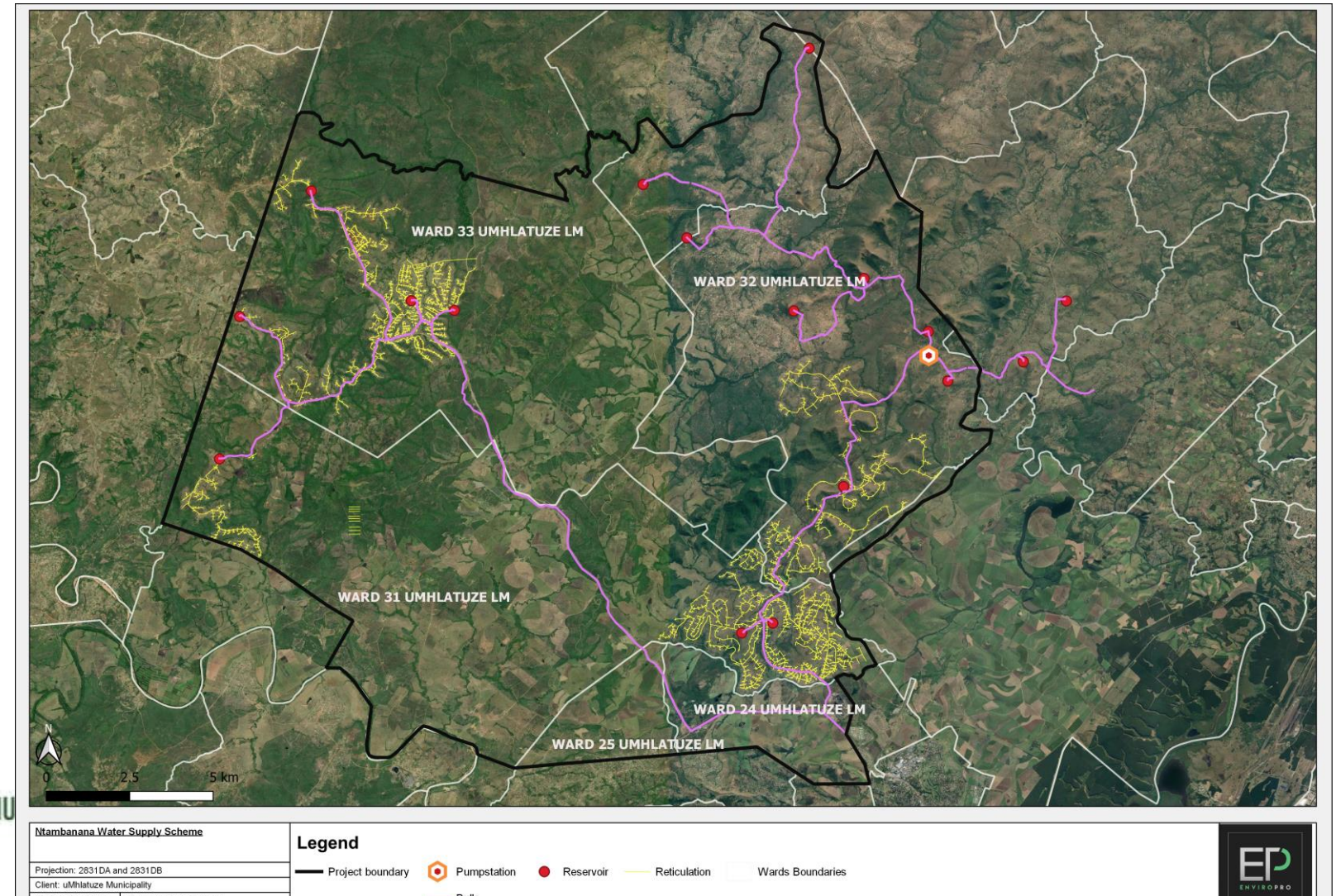
- The previous WSS design philosophy was uneconomical and impractical.
- Intermittent water interruptions in the previous WSS created frustration in the community who resorted to illegal connections for access to water.
- The water source was unreliable and was shared with a number of water schemes.
- There was a history of poor water management. There were no individual household water meters installed to control water leakage and to manage water losses.

[2] Upgrade of Water Supply Infrastructure for Ntambanana Supply Area (Upper Nseleni Supply) Feasibility Report (Rev 1) March 2022. Civtech Engineers.

The Ntambanana WSS was redesigned with an updated and realistic design philosophy where the topography of the areas were divided into specific reservoir supply zones. A water reconciliation strategy for Richards Bay and surrounding towns (including Empangeni) undertaken by DWS was implemented where reliable water sources have been developed and implemented. A detailed assessment for sourcing water was undertaken for this project.

The water source supplying this scheme will come from Empangeni Town's Hillview Reservoir which has capacity (currently 7.2 Mℓ/d) to supply the Ntambanana WSS. The Ntambanana WSS will have a water demand of 3Mℓ/d.

Figure 1: Aerial Photograph Showing an Overview of the proposed water supply scheme. Google Earth Image, 2022.



1.9. Construction Methodology

Please note construction of the pipeline through the major watercourse crossings should take place in the dry season to ensure there is less water within the watercourse systems during construction. If required for construction purposes the water within the watercourses will be redirected around the active work zone, however the flow of the watercourse will still remain in the river channel. Sand bags acting as impeding structures will be manually placed within the watercourses to redirect the flow. Once work has been completed or there is no longer the need to redirect the flow the sand bags will be removed allowing the water to flow on it most desired course.

1.10. Table of Responsibilities

This is to state that the undersigned have received a copy of the Environmental Management Plan (EMPr) developed for this site by *EnviroPro* dated August 2022. Any contravention of the EMPr must be recorded and corrective action must be carried out. Any changes to the EMPr must be approved by the *Environmental Control Officer (ECO)*, the consultant *EnviroPro* and the relevant authority. Such changes are to be made in writing and a record must be maintained.

The undersigned do hereby agree to abide by the structures of the Environmental Management Plan (EMPr) and accept responsibility for ensuring adherence to the Construction EMPr as it relates to the following areas:

Table of Responsibilities				
Job description / title	**Scope of work or area of responsibility i.e. camp drainage, construction camp , housekeeping etc.**	**Responsible person (Name)**	**Signature**	**Date**

1.11. Names and Telephone Numbers of Contact Persons

The following list of contacts must be printed and made clearly visible on the site.

Contact List			
Designation	**Organisation**	**Name**	**Contact number**
Applicant	The City of Umhlatuze Municipality		
Consulting Engineer	Civtech		
Independent Environmental Practitioner and ECO	EnviroPro	Josette Oberholzer Rob Rowles	031 765 2942
Environmental Authority (Enforcement & Compliance)	EDTEA	Compliance Officer	
Reporting for Incidents involving Watercourses	DWS	Compliance Officer	
Wildlife Related Incident	Ezemvelo KZN Wildlife	Dominic Wieners	033 845 1455
Heritage Resources	AMAFA	Weziwe Tchabalala	033 394 6543
Fire Emergency	Fire Department	-	10111
Crime Emergency	Police	-	10111

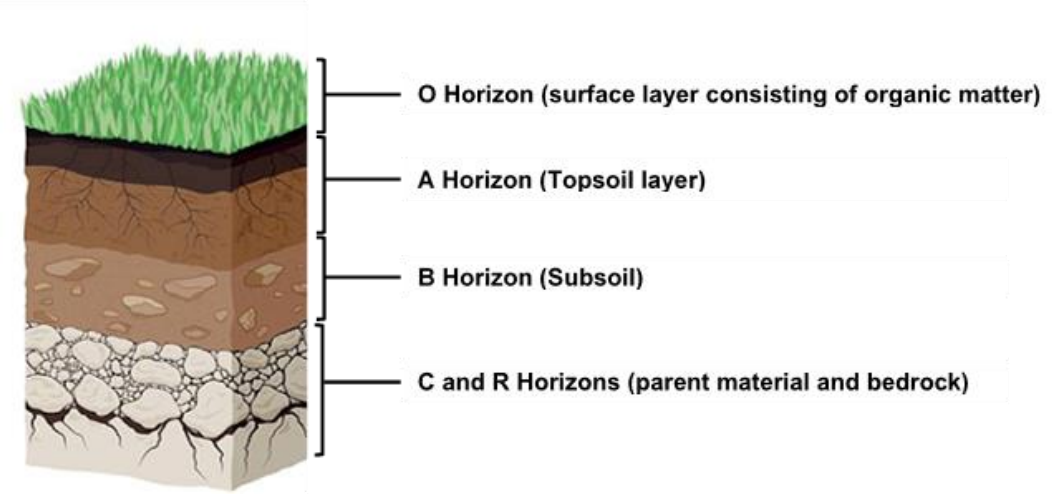
SECTION 2 SITE SPECIFIC IMPACTS AND MITIGATIONS AS IDENTIFIED IN THE BAR

Nature and Consequences of impact	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Person	In place (Yes / No)	Comments
Deposition of eroded material into water bodies when laying pipe across the 63 watercourses, impacting water quality (increased turbidity, reduction of dissolved oxygen).	This impact is unavoidable. However, the pipeline and related infrastructure are going to be constructed along the existing road servitudes and previously cleared sections of watercourse crossing points for the majority of the pipeline network. The watercourse has been previously disturbed at these locations thereby limiting the amount of disturbance impacting the watercourse. The following measures must be carried out to mitigate the disturbance of the watercourse area: • Construction work within the watercourse areas must be strictly limited to the construction footprint only. A construction corridor of 10m within each watercourse must be maintained. • No areas may be excavated outside of the project footprint. • No soil stockpiles may be placed within 32m of a watercourses. All stockpiles must have sufficient erosion protection measures to ensure sediment is not dislodged as runoff resulting in erosion and sedimentation. • The areas outside of the watercourse areas must be demarcated as no go areas with snow netting. • The watercourse area must be rehabilitated as soon as the installation of the pipeline has been completed. • A dry work area is required for the installation of the pipe and pouring of the concrete. Minor diversions may be required within the channel of the rivers. Water will be diverted around the work area. It is recommended that large sand bags are used for the diversion. This enables the contractor to shift the work as construction progresses.	CON/EO		
Physical damage to wetland areas associated with the rivers and tributaries during excavation.	A maximum construction servitude width of 10m must be adhered to when working within the wetlands. The rest of the surrounding area must be demarcated as ‘no-go areas’ to prevent workers from unintentionally encroaching into wet areas. Furthermore: • The pipeline must run as close to all existing pipelines as possible to reduce the disturbance footprint in undisturbed areas. • No storage of material, vehicles or equipment is permitted within the wetland areas; • Apart from where the pipeline crosses the wetlands, a buffer of 32m is to be maintained around wetland areas; • No heavy vehicles will be permitted to work in the wetland areas unless exceptionally hard material is encountered and the trench cannot be dug by hand. Pipework around these sensitive areas should be laid by hand.	CON/EO		

Nature and Consequences of impact	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Person	In place (Yes / No)	Comments
	• No dumping of material or waste may occur within these areas. All material and waste must be taken back to the construction camp at the end of the day. • Designated stockpile storage areas must be established outside of the wetland areas. • The contractor must limit in-stream work to minimize streambank and bed disturbance. • Construct the pipeline in the larger watercourses in the dry season (between early May and late September) where possible when water levels will be lowest and the risk of erosion and downstream siltation is lowest. • Any disturbed areas within the construction footprint must be rehabilitated within a month of occurrence to the satisfaction of the ECO and or EDTEA Compliance Authorities. • All activity within the watercourse must be strictly according to the prescribed engineering designs and approved drawings. • The pipeline must be constructed according to approved engineer gradients to allow for the free flow of water over the pipeline. • Reno-mattresses or large aggregate must be used for energy dissipation in the channel downstream of the pipeline to reduce the likelihood of scouring the watercourse bed and prevent downstream sedimentation of the catchment. It is preferable that larger aggregate be used to avoid flows removing aggregate material from the site. • Erosion prevention and temporary sediment control measures must be implemented in areas prone to channelled flow and erosion. Temporary and permanent erosion control methods may include silt fences, interceptor ditches, seeding and sodding, riprap of exposed embankments, and mulching. • Any stockpiles within 32m of a watercourse area must have sufficient erosion protection measures to ensure sediment is not dislodged into the watercourses. The vegetation that could be utilised for wetland rehabilitation:			

<table>
<tr><th>Nature and Consequences of impact</th><th>Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:</th><th>Person</th><th>In place (Yes / No)</th><th>Comments</th></tr>
<tr><td></td><td>
<table>
<tr><th>Wetland Aspect</th><th>Risks</th><th>Objectives</th><th>Plant species</th><th>Recommendation</th></tr>
<tr><td>Embankments</td><td>Erosion, bank collapse and steep banks</td><td>To slow water flows and provide soil stability</td><td>• Schoenoplectus brachyceras
• Pennisetum macrourum
• Cyperus esculentus
• Cyperus sexangularis
• Eragrostis curvula
• Eragrostis gummiflua
• Eragrostis lehmanniana
• Imperata cylindrica
• Sporobolus africana</td><td>Slope banks and slight contouring to aid in plant establishment and slowing of water flows down the slopes. Seed should be sowed in a mix. Plants can be sourced from the area and replanted if removal is necessary to accommodate the project.</td></tr>
<tr><td>Saturated channel area</td><td>Erosion, soil dispersion and downstream impacts</td><td>Trapping of sediment, water filtration, improvement of plant diversity</td><td>• Phragmites australis
• Typha capensis
• Nymphoides thundergiana
• Juncus spp.</td><td>Seed should be sowed in a mix and towards the end of the dry season.
Plants can be sourced from the area and replanted if removal is necessary to accommodate the project.</td></tr>
</table>
</td><td></td><td></td><td></td></tr>
<tr><td>Erosion of exposed soil prior to the rehabilitation of the construction area (i.e. trenches).</td><td>Exposed soil is very susceptible to erosion and therefore erosion control is critical, especially around the watercourse crossings.
• Exposed areas will be rehabilitated and re-vegetated as soon as possible during construction.
• Cleared areas may not be left exposed for long periods of time (2 weeks) and should be re-vegetated in stages on completion of a section of the pipework.
• Cleared areas may not be left exposed for long periods of time and should be re-vegetated in stages on completion of a section of the pipework.
• Small inspection holes may be left open along the route but the rest of the trench must be closed once the pipe has been laid.
• In certain steeper sections additional precautions to manage erosion will be required (e.g. sand bags or gabions).
• During the exaction of trenches, flows must be diverted around the active work areas to prevent channelled flow.</td><td>CON/EO</td><td></td><td></td></tr>
</table>

Nature and Consequences of impact	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Person	In place (Yes / No)	Comments
	• Temporary stormwater channels and preferential flow paths should be filled with aggregate and/or logs (branches included) to dissipate and slow flows thereby limiting erosion. • Trenches must not be left open for longer than 2 weeks at a time. Trench work must be completed in sections and then closed once the pipe has been laid in that section. Small inspection holes may be left open along the route but the rest of the trench must be closed. Cleared areas may not be left exposed for long periods of time and must be re-vegetated as each stage of pipework is completed. Trenches must not remain open during building shut down periods i.e. over Christmas and Easter. Trench work must be planned so that trenches are closed before these shut down periods as there is a risk that the trenches will either collapse or fill with water if left unattended and this can create a hazard for children and animals.			
Trenches remaining open for long periods of time, causing them to collapse, creating an erosion and safety hazard.	Trenches must not remain open indefinitely. Trench work must be completed in sections and then closed once the pipe has been laid in that section. Small inspection holes may be left open along the route but the rest of the trench must be closed. Cleared areas may not be left exposed for long periods of time and must be re-vegetated as each stage of pipework is completed. Trenches must not remain open during building shutdown periods i.e. over Christmas and Easter. Trench work must be planned so that trenches are closed before these shut down periods as there is a risk that the trenches will either collapse or fill with water if left unattended and this can create a hazard for children and animals. Trenches must be demarcated.	CON/EO		
Incorrect filling of trenches on completion creating points of erosion, especially on slopes and near watercourses.	Care must be taken to ensure that when closing trenches, soil is compacted sufficiently and left so that the level of the trench is slightly higher than the surrounding land, to allow settling. Should soil settle below the level of the surrounding land, it will leave a depression along which water will travel and this could create a focal point for erosion. This can occur on sloped sections where water will follow the depression along the pipeline route, building up speed down steeper sections and creating furrows. If this occurs near watercourses, it will erode the river banks and cause them to collapse. Rehabilitation through replanting of indigenous grass species soon after closure will aid in stabilising soil and preventing erosion and will also assist in dust control.	CON/EO		

Nature and Consequences of impact	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Person	In place (Yes / No)	Comments
	Backfilling of incorrect soil horizons: depending on the depth of each soil horizon, the top soil (approximately 5 -20cm depth) must be separated from deeper horizons during trench excavation activities. This will involve the excavation and stockpiling of different soil types (see Figure 17 below) into separate piles on either side of the trench (to prevent soil type mixing). Each stockpile (i.e. each Horizon) must be placed back into the trench in the order it was excavated, i.e. start with bottom layer and finish with the topsoil layer. This must be conducted in order to retain the nutrient composition within the topsoil layer (required for the growth of plant species characteristic of the ecosystem type) once the trench has been backfilled. This will result in the efficient and effective rehabilitation of excavated, and subsequently backfilled, pipeline trenches.  			
Excavations within the community impacting on features with heritage value (i.e. graves, historical ruins or medicinal trees).	Should any un identified graves or artifacts be identified within the project area, a 20m buffer must be maintained around the site. The pipeline routes will need to be diverted by 20m if and when they intercept a heritage/ archaeologically sensitive site. Construction workers must be trained to operate with care on-site and should a culturally sensitive aspect be discovered on site that has not been previously identified, construction	CON/EO		

<table>
<tr><th>Nature and Consequences of impact</th><th>Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:</th><th>Person</th><th>In place (Yes / No)</th><th>Comments</th></tr>
<tr><td></td><td>activities stop temporarily and the issue assessed and the authorities (AMAFA) notified if need be.
The following sites require specific mitigation. Each site must be demarcated with snow netting for the duration of construction in the vicinity of the site.
<table>
<tr><th>ASPECT</th><th>COORDINATES</th><th>DISTANCE FROM PIPELINE</th><th>MITIGATION REQUIRED</th></tr>
<tr><td>Khoz 578 – H35 House</td><td>28°36'55.76"S 31°53'40.85"E</td><td>3m from bulk pipeline</td><td>Divert the bulk pipeline to the other side of the road.</td></tr>
<tr><td>Khoz 582 – H31 House</td><td>28°37'47.11"S 31°52'59.12"E</td><td>10m from 25mm pipe</td><td>Divert this reticulation pipe more than 10m away from the historical house.</td></tr>
<tr><td>Khoz 500 - House</td><td>28°37'20.81"S 31°52'15.14"E</td><td>8m from a 50mm pipe</td><td>Divert this reticulation pipe more than 10m away from the historical house.</td></tr>
<tr><td>Khoz 499 – E Ingens Tree</td><td>28°37'10.35"S 31°52'25.07"E</td><td>4m from a 50mm pipe</td><td>Divert this reticulation pipe more than 20m away from the historical house.</td></tr>
<tr><td>Khoz 498 – Marula tree</td><td>28°37'10.84"S 31°52'24.19"E</td><td>1m from a 50mm pipe</td><td>Divert this reticulation pipe more than 20m away from the historical house.</td></tr>
<tr><td>Khoz 577 – Muti tree</td><td>28°36'45.53"S 31°53'54.74"E</td><td>59m from blulk line</td><td>Demarcation during construction, no deviation required.</td></tr>
<tr><td>Khoz 575 - graves</td><td>28°36'45.58"S 31°53'57.29"E</td><td>6m from proposed bulk line.</td><td>Divert the bulk pipeline to the other side of the road, more than 20m from the grave sites.</td></tr>
<tr><td>Khoz 576 - graves</td><td>28°36'45.19"S 31°53'57.04"E</td><td>2m from proposed bulk line.</td><td>Divert the bulk pipeline to the other side of the road, more than 20m from the grave sites.</td></tr>
<tr><td>NTA 334 – E Ingens 2</td><td>28°35'13.31"S 31°44'20.86"E</td><td>20m from a pipe that will be disconnected.</td><td>Disconnect the pipe in question but do not removed the old pipeline. Leave the ground intact.</td></tr>
<tr><td>NTA 332 - cemetery</td><td>28°36'8.29"S 31°44'59.58"E</td><td>10m from the bulk line</td><td>Divert bulk line to opposite side of the road or place the bulk line in the road servitude 15m from the site. Erect demarcation of the cemetery pre construction to prevent accidental damage during construction.</td></tr>
<tr><td>NTA 314 – Gr6</td><td>28°42'30.14"S 31°50'56.27"E</td><td>18m from the bulk line on the opposite side of the road.</td><td>Demarcate the grave with snow netting during construction. No deviation required.</td></tr>
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<table>
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<tr><td></td><td>
<table>
<tr><td>NTA 313 – Gr6</td><td>28°42'42.34"S 31°51'43.03"E</td><td>1m from a 50mm pipe</td><td>Divert this reticulation pipe more than 20m away from the grave.</td></tr>
<tr><td>NTA 308 - Gr7</td><td>28°42'40.58"S 31°51'41.63"E</td><td>1m from a 50mm pipe</td><td>Divert this reticulation pipe more than 20m away from the grave.</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
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</td><td></td><td></td><td></td></tr>
<tr><td>Clearing of indigenous vegetation during the laying of the pipeline and temporary access points.</td><td>The construction footprint is 10m wide within the watercourses and 15m wide outside of the watercourses.
The vegetation that will be cleared must be restricted to the construction footprint of the pipelines. No vegetation may be cleared other than that is required for access to the site or for the construction activities associated with the construction of the Ntambanana Water Supply Infrastructure.
The majority of the pipeline network will be placed in the road and previous pipeline servitudes where the vegetation has been previously disturbed. In order to minimise the amount of vegetation cleared, the following measures have been included in the EMPr:
All protected vegetation identified within the pipeline servitude must not be cleared or relocated before a permit for relocation or removal has been obtained from KZN Wildlife.
A maximum trench servitude of 15m (7.5m on either side of the trench) must be adhered to for this pipeline construction.
A maximum width of 10m must be managed within the watercourse crossing points.
A narrow strip of vegetation may be required for the pipeline networks, no wider than 15m.
Clearing of vegetation and excavating of the trench in close proximity to the watercourses will need to be done by hand, where possible. Vehicle access will be restricted as there is a higher risk of damage and disturbance to surrounding vegetation.
All access routes are to follow the existing roads / access tracks.
The contractor must ensure that invasive species do not gain a foothold along the cleared route until the indigenous vegetation has had time to re-establish.</td><td>CON/EO</td><td></td><td></td></tr>
<tr><td>Draining excavated areas during construction.</td><td>The draining of the excavated areas during construction is essential in order for construction activity to take place for the foundations of the structure within the</td><td></td><td></td><td></td></tr>
</table>

Nature and Consequences of impact	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Person	In place (Yes / No)	Comments
	watercourse (such as pouring concrete). The following mitigation measures must be carried out: • Where possible, all excavated areas must be drained into a temporary settling pond before releasing the water into the downstream watercourse area, • Where this is not possible or practical, the pumped water must be released onto reno-mattresses or pack rock to prevent the scouring and resultant downstream erosion from the pumped pipe outflow. • Silt screen can also be used to prevent sediment-laden water entering the river.			
Constructing the pipeline through areas of natural habitat.	The following measures must be carried out to mitigate against excessive habitat destruction within the Ntambanana Water Supply Scheme area: • The areas outside of the project footprint must be managed as no go areas for the duration of construction. • Any animal found within the project construction area must be removed unharmed from the site. • Erosion prevention and sediment control measures must be implemented. Temporary and permanent erosion control methods may include silt fences, interceptor ditches, seeding and sodding, riprap of exposed embankments, and mulching; • The project footprint must be kept as small as possible; • Heavy machinery must not be permitted to move beyond the demarcated footprint. The recommended buffer of 32m must be implemented. • Sand and aggregate for concrete must not be obtained from any watercourse but must be sourced from a permitted source; • Contamination of the river system with unset cement must be prevented as it is detrimental to aquatic biota. Due to the potential presence of vulnerable fish species, construction activities need to consider fish migrations (fish ways) when constructing the pipeline and associated infrastructure within the larger watercourses8. The proposed pipeline crossing will not result in the creation of any additional fish migration barriers as the pipeline will be below the surface of the river bed. However, any temporary diversion could impact fish movement and must ensure that water flow is only redirected and not blocked. Any activity affecting the water quality could affect fish within the river.			
Encroachment of alien vegetation into disturbed	Alien vegetation (weeds) were noted at some of the watercourse crossings, due to previous disturbance associated with construction of roads, and pipeline infrastructure. The Contractor	CON/EO		

Nature and Consequences of impact	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Person	In place (Yes / No)	Comments
areas during construction.	is to ensure that the alien vegetation does not further establish within the disturbed areas associated with the excavation of the trench. Any cleared area for the pipeline is the contractor's responsibility to keep free from alien vegetation encroachment. Alien vegetation within the construction footprint must not be allowed to encroach onto the site and must be continually removed (monthly) during construction. All soil stockpiles must be free from alien invasive species before they are used to backfill the trenches.			
Damage to archaeological and culturally sensitive aspects.	The HIA recorded 35 heritage sites that occur within 50m of the pipeline footprint. Some of these will require the pipeline to be re-aligned between 5-20m. A prescribed 20m buffer must be placed around all graves that occur near the pipeline in which no construction work whatsoever is undertaken within 20mn of a gravesite. Should any human remains be uncovered during construction, then a 20m radius around that area must be delineated and all work must stop in that specific area: work may continue either side of the remains. The SAPS and KZNARI need to be informed and the remains may only be removed once KZNARI has granted permission and has supplied the relevant permits. These are graves outside of a formal cemetery and are thus protected by the KZNARI Act of 2018. Similarly, some trees, such as *the Euphorbia ingens*, *Erythrina spp*. And *Ziziphus spp*., are traditional grave markers. Other trees, such as the Marula tree are used for muthi, and are thus cultural resources. All of these types of trees should be avoided. Young/new *E. ingens* will not be associated with graves as this custom has not been used for a few decades. The recorded sites have been provided below (Table 4, Pg 73 of the HIA report). The sites highlighted in red require mitigation measures due to their proximity to the proposed pipelines:: **Name Latitude Longitude Description Mitigation** KHOZ 576 -28.612553 31.899179 E. ingens none KHOZ 577 -28.612648 31.89854 Muthi tree Do not remove tree KHOZ 578 -28.61549 31.89468 Grave pipe must stay next to road			

Nature and Consequences of impact	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Person	In place (Yes / No)	Comments
	KHOZ 579 -28.62536 31.889011 house none KHOZ 580 -28.626466 31.888368 house none KHOZ 581 -28.630079 31.882724 H31 none KHOZ 582 -28.629752 31.883088 H31 graves re-assess with surveyor after final layout KHOZ 583 -28.629855 31.883218 H31 none KHOZ 584 -28.63005234 31.87692077 grave? none KHOZ 585 -28.63008 31.87694 grave? none KHOZ 586 -28.630077 31.876944 grave? none KHOZ 587 -28.63006918 31.87697525 grave? none KHOZ 588 -28.63002071 31.87685295 grave? none KHOZ494 -28.71302921 31.86188559 grave none KHOZ495 -28.71237168 31.85607905 grave none KHOZ496 -28.66396206 31.86532919 grave none, but pipeline cannot go beyond the fence KHOZ498 -28.619678 31.873385 Marula do not remove KHOZ499 -28.619542 31.873631 E. ingens do not remove KHOZ500 -28.62244696 31.87087117 tree do not remove KHOZ551 -28.610867 31.899253 grave none NTA276 -28.69499459 31.86181491 graves none NTA283 -28.68087891 31.85559737 grave none NTA284 -28.6763217 31.8582415 grave none NTA291 -28.6270891 31.8791908 walling none NTA294 -28.68252347 31.83681003 Cemetery none NTA295 -28.6912539 31.8449794 Cemetery none NTA298 -28.69982031 31.8383184 Temple none NTA300 -28.7166087 31.8453761 Grave none NTA302 -28.7164056 31.8455158 Grave none NTA304 -28.71498011 31.84702013 Grave none NTA308 -28.7112725 31.8615633 Grave move to opposite side of road NTA312 -28.7094869 31.87270428 Grave move to opposite side of road NTA313 -28.7117619 31.8619514 Grave move to opposite side of road NTA314 -28.7083732 31.84896442 Grave move to opposite side of road			

Nature and Consequences of impact	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Person	In place (Yes / No)	Comments
	NTA320 -28.70224751 31.86308209 E. ingens, Grave?; h36 none NTA321 -28.7025364 31.8637065 Grave none NTA332 -28.6023033 31.7498846 Cemetery move to opposite side of road NTA334 -28.5870294 31.7391281 E ingens 2 move pipeline 5m north NTA337 -28.5973666 31.7313873 Grave or jojo base none NTA339 -28.59685926 31.73280308 Graves x2 none KHOZ 575 -28.61266123 31.89924677 E. ingens none NTAM A -28.5652 31.69753 Palaeontology None NTAM B -28.6058 31.68769 Palaeontology None NTAM C -28.6183 31.75628 Palaeontology None NTAM D -28.7159 31.86725 Palaeontology None NTAM E -28.6691 31.66331 Palaeontology None NTAM10 -28.638 31.76378 Palaeontology None NTAM11 -28.6286 31.75921 Palaeontology None NTAM12 -28.6271 31.75862 Palaeontology Monitor during excavations. PIA discretion for distance NTAM13 -28.6096 31.74448 Palaeontology None NTAM14 -28.5895 31.72519 Palaeontology None NTAM15 -28.6636 31.69652 Palaeontology None NTAM16 -28.6674 31.68057 Palaeontology None NTAM17 -28.6571 31.67336 Palaeontology None NTAM18 -28.6471 31.68204 Palaeontology None NTAM19 -28.625 31.72208 Palaeontology None NTAM2 -28.6999 31.86125 Palaeontology None NTAM20 -28.6221 31.72309 Palaeontology None NTAM21 -28.6018 31.74981 Palaeontology None NTAM22 -28.5917 31.75696 Palaeontology None NTAM23 -28.5989 31.73986 Palaeontology None NTAM3 -28.7079 31.84866 Palaeontology None NTAM4 -28.7128 31.81731 Palaeontology None NTAM5 -28.6923 31.80101 Palaeontology None NTAM6 -28.6608 31.78221 Palaeontology			

Nature and Consequences of impact	Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated:	Person	In place (Yes / No)	Comments
	NTAM7 -28.6606 31.78031 Palaeontology Monitor during excavations for 100m NTAM8 -28.6585 31.77385 Palaeontology Monitor during excavations for 100m NTAM9 -28.6542 31.76892 Palaeontology Monitor during excavations for 100m During construction, all grave sites within 20m of the pipelines,as identified above, must be demarcated clearly with snow netting or survey poles for the duration of construction in that area.			
Damage to Palaeontological resources	Twenty-eight sensitive areas were visited and assessed in terms of significance. Of these areas, five require monitoring during construction activity by a suitably qualified paleontologist. Four of these areas will require monitoring for approximately 100m, while the fifth site will require monitoring for as long as is deemed necessary. A "Chance Find Protocol" has been included into the EMPr. The protocol must be monitored continuously during the construction phase when excavations of deeper than 1.5m are planned for this project. The 'Chance Find Protocol' requires that a PIA undertakes a site visit during construction to determine if any fossils have been exposed in the designated sensitive areas. This will not hinder construction time since most of the soil samples will be on the side of the trench already.			

SECTION 3 CONSTRUCTION MITIGATION MEASURES

3.0 Site Camp, Storage & Handling of Hazardous and Non Hazardous Materials & Stockpiling

Activity	Required Action / remediation to control environmental impact	Person	In place (Yes / No)	Comments
Location & Establishment of the	• The construction camps must be marked out with the approval of the ECO.	CON		

construction camps along the Ntambanana Pipeline	• The site camps must be located on a flat portion of land. • Do not set up the construction camps within 32m a watercourse or wetland.	CON		
	• The site camps must be clearly demarcated and fenced off to prevent illegal entry.	CON		
	• The following areas must be demarcated and clearly marked within the construction camps: ○ **A waste storage area** ○ **A materials storage area** ○ **Areas for fuel and hazardous chemical / flammable goods** ○ **Stockpile areas** ○ **Vehicle servicing and wash bay areas (if required)** ○ **Parking area**	CON		
Establishing storage areas & Stockpiles	• **A waste storage area** must be demarcated and suitable and sufficient waste bins must be provided within the camps. Storage of waste must be on a hard surface, and under cover. Liquid waste must be situated within a bunded area. ○ Liquid waste and accumulated waste must be removed from site monthly by a recognized Waste Contractor.	CON		
	• **A materials storage area** must be identified and designated within the construction camps which must be located more than 32m from any watercourse. Materials, specifically liquid and potentially environmentally hazardous materials must be stored within a bunded area (110% capacity of largest container) and on a hard surface. The storage area must be under cover.	CON		
	• **Areas for fuel and hazardous chemical / flammable goods** must be identified and clearly signposted within the construction camps. An inventory of the materials and volumes stored must be maintained and updated once a week. These areas must be located within a bunded, hard surfaced impermeable area.	CON		
	• **Bulk fuel storage:** No bulk fuel storage to occur on site.	CON		

	• **Designated areas for stockpiling of raw materials** must be demarcated within the construction camps. No stockpiling is to occur on or near slopes where they could be washed into the surrounding properties or into the river. All stockpiling areas must be approved by ECO and must be located more than 32m from the edge of any watercourse.	CON		
	• **Parking:** The contractor must designate parking areas on the sites and ensure that only these parking areas are used. • Vehicles must not park within 32m of any watercourse.	CON		

	• **Vehicle servicing and washing:** only emergency (breakdown where equipment is no longer mobile) and minor maintenance (e.g. greasing) may be done on the sites.
	  ○ A designated area must be set aside for this, which must be hard surfaced and bunded.
	  ○ If emergency repairs are required, this must not be conducted within 32m of any watercourse, riparian zone or wet area.
	  ○ Drip trays must be used during servicing and under all leaking vehicles and plant.
	  ○ Any other planned or required maintenance must be done off site at a suitable location.
	  ○ Vehicle washing must be conducted off site at a designated vehicle wash bay, the washbay must be lined with impermeable material and must drain to a sump to ensure hydrocarbons, and other contaminants are separated out of the effluent prior to remaining runoff being discharged into municipal sewer.
	  ○ No cement vehicles may be washed on site.
		CON		

Handling of liquids on site	• Decanting of any liquids / chemicals paints etc. must be done within the confines of a drip tray or on a hardened surface within a bunded area. • This must not be carried out within 32m of any watercourse.	CON		
	• Decanting from large containers (e.g. 210L drums) must be done using a hand pump, where possible. If no hand pump is available, liquids must be decanted on a drip tray using a funnel. • This must not be carried out within 32m of any watercourse.	CON		

	• All handling of hazardous materials including cement must take place on a hardened surface or within a drip tray or cement mixing tray. • This must not be carried out within 32m of any watercourse.	CON		
	• Decanting of hazardous materials must take place within the site camp above drip trays or containers to prevent the potential spillage into these areas.	CON		
Inventory and record of substances stored on site	• A full inventory of hazardous substances and Material Safety Data Sheet (MSDS) for each substance stored on site must be maintained and each substance must be stored and managed in accordance with the MSDS.	CON		
Storage of hazardous materials	• Hazardous materials and liquids to be stored in the assigned storage area as per Section 3.0 of this EMPr.	CON		

3.1 Administration & Records

Activity / Document	Required Action	Person	In place (Yes / No)	Comments
Site Specific EMPr	• Keep a hard copy of the Site Specific EMPr on site and ensure that it has been signed and received by the contractor and engineer.	CON		
	• All contractors, the engineers and the ECO must have a copy of the EMPr before coming on to site.	ECO/ ENG		
Records	• Keep records and proofs of all agreements, meetings etc. to demonstrate compliance with this EMPr.	CON		
Proof of raw material sourcing and resource use	• Proof of sustainable source of all materials used must be obtained and documented especially for raw material i.e. topsoil, sands, natural gravels, crushed stone, clay liners, timber etc. In other words, documented proof that materials have been sustainably sourced must be maintained on site for review by EDTEA. ○ E.g.: sand may only be obtained from an approved sand winning operation, which is licensed by the Department of Mineral Resources (DMR) and has an approved EMPr for operation.	CON/ EO		

	○ Where materials are borrowed (mined), proof must be provided of authorization to utilise these materials from the landowner / mineral rights owner and the Department of Minerals and Energy.			
Water abstraction for dust suppression	• Water used on site must be obtained from a municipal source. If this is not available and water needs to be obtained from a nearby water resource then the following will apply: ○ If water is to be extracted it must be from an approved source and permission from the land owner must be obtained. ○ If water is extracted no more than 50 000l per day may be extracted. All water use must be registered with DWS. ○ If water is extracted, a daily record of the volume of water extracted must be retained and: ▪ The driver must record each truck load that is removed and this will be used to determine the volume of water extracted. ▪ These records must be provided to the ECO for record and review. ▪ The ECO must monitor volumes to ensure that usage remains below 50 cubic metres per property per day or that abstracted amounts remain within those allowed by the permit that must then need to be applied for. ○ Water use must be controlled and reduced wherever possible.	CON/ EO		
Maintenance of the extraction point	• One point of entry must be established and approved by the ECO. Multiple entry points and pathways will not be permitted. • Multiple abstraction points are not permitted. • The abstraction point must not be established within wetland areas or in areas thickly vegetated by riparian vegetation. • The abstraction point must be easily accessible and where possible, located in close proximity to an established road to avoid creation of additional tracks.	CON/ EO		

	• The abstraction area must not be located on steep slopes where the point may be come eroded. • Vehicles approaching the extraction point must remain 32m away from the edge of the water resource except where required to pump directly from the stream/river. • No vehicle repairs or maintenance or refuelling may be conducted at the abstraction point. • Damage to the banks of any water resource must not take place. • Should the area become damaged or eroded, erosion protection measures such as sand bags or hessian sheeting must be put in place to allow the re-establishment of vegetation and stabilisation of the area. • Once an abstraction point is no longer being used, the area must be rehabilitated to its former state.			
Proof of training	• Keep training attendance registers on file at all times.	EO		
Incident records & Photographs	• Keep records of incidents that have occurred and how they were remediated. It is a good idea to take photographs when incidents occur and then to take follow up pictures to demonstrate remediation and keep these on record. • These records must be kept on site for review by EDTEA.	EO		
Appointment of ECO / EO	• Appoint an ECO (Environmental Control Officer) prior to commencement of construction to monitor the entire construction phase.	ENG		
	• Keep proof of appointment and contact details as well as dates of audits.	APP		
Emergency response plan	• An emergency response plan must remain on site as must a copy of the EMPr and the Environmental Authorization.	ECO		
Audits	• A record of audits conducted on the site as well as findings must be kept on site.	CON/ EO		
Permits & Approvals	• Keep all necessary permits and approvals on file i.e. construction licences etc. • These must be kept on site for review by EDTEA.	CON		
MSDSs	• Material Safety data Sheets (MSDSs) are to be kept on site for all hazardous materials.	CON		

3.2 Training & Awareness				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Who should be trained & Frequency of training	• All construction staff must have basic environmental awareness training, which can be conducted at the same time as the required health & safety training.	EO		
	• Staff must be trained on their environmental responsibilities before commencing work and refresher sessions can be conducted during toolbox talks on specific areas causing problems.	EO		
	• Staff must sign training register and Records of training must be kept. • These records must be maintained on site for review by EDTEA.	EO		
Training Content and staff conduct	• Training must include 1. The definition of environment (people + air + soil + water +business); 2. Reasons for conserving and protecting the environment; 3. How the following activities can impact the environment: - Not using assigned ablutions, hazardous materials, uncleaned spills, mixing of cement or paint on soil or grass surfaces, waste management i.e. use of waste receptacles and waste separation for recycling, vehicle washing polluting soil & ground water; litter; 4. What to do to prevent the above impacting the environment i.e. assign impermeable mixing areas, no vehicle washing on site,	EO		

	use of waste receptacles and separation of waste to allow for recycling, how to respond in an emergency and deal with a spill; 5. Consideration of neighbours. 6. Do not play music or create any other disturbance to neighbours. 7. Use only the chemical toilets provided. 8. No dumping to occur in sensitive areas on site. 9. Use waste bins provided. 10. Use drip trays provided. 11. Do not build fires for any purpose on the site. 12. Behave in socially acceptable manner and do not use drugs or alcohol on site. 13. There is to be no hunting of wildlife on the site and no setting of snares or traps. No animals are to be harmed or harassed.			
Neighbours & Working hours	• Local community members must be notified of the project through community leaders and must be notified of the existence of any hazardous storage areas as well as the type of chemicals being used on site. This can be achieved through placement of signboards.	CON		
	• Limit hours of operation to weekdays 7-5pm and Saturday mornings 7- 12pm. Neighbours to be notified before construction on weekends takes place.	CON		
	• Advise the adjoining neighbours of the work and hours of work at least one week prior to commencement. This can also be indicated on the signboards.	CON		
	• Neighbours to be advised prior to periods where work will be done outside normal working hours.	CON		

3.3 Sensitive Social Areas, Environmental Areas, Vegetation and Vegetation Clearing and Wildlife				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Community	• The surrounding stakeholders must be made aware of the commencement of construction 30 days prior to construction.	CON		

	Alternate temporary access routes must be determined prior to the commencement of the construction.			
Water Resources Specialist Mitigation Measures	The following recommendations have been made to ensure the conservation of the delineated riparian zone during the construction and operational phase; • Riverine features should be avoided where possible through alternative pipeline routes which have been illustrated in the risk assessment; • A General Authorisation should be applied for considering the "Low" post-mitigation significance ratings; • Rehabilitation must be concurrent with the laying of the pipeline, with the excavation, pipeline laying and backfilling working systematically in 100 m intervals rather than the entire footprint being excavated to await pipeline laying; and • Prior to clearance of vegetation, a walkdown must be conducted by a suitably qualified specialist to identify and record the protected species that will be impacted by the development. The necessary permits must be applied for prior to commencement on site. This walkdown must be completed in the appropriate season. • The first 300 mm of soil must be stockpiled separate from the soil excavated deeper than 300 mm; and • The proposed pipeline system must be divided up into 100 m intervals. Each interval's soil must be stockpiled and filled back up (in the correct order) to avoid long periods of stockpiling. • All excavations within the river's 32 m buffer zone must be carried out by means of manual labour instead of heavy vehicles;	CON/ EO		

	• All associated non-linear infrastructure must be outside the delineated 32 m buffer zones which are considered no go zones for these activities; • Various areas of concern have been identified where the proposed pipeline intersects the freshwater resources. The construction phase must be divided into sections. The construction should be started and then rehabilitated before starting with the next section; • The footprint area of the pipeline must be kept a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas; • The footprint area must be aligned in existing road reserves wherever possible. Disturbed areas should be sought as the preferred alignment area; • Pipeline trenches and sandy bedding material may produce preferential flow paths for water across the project area perpendicular to the general direction of flow instead of angle. This risk can be reduced by installing clay plugs at intervals down the length of the trench to force water out of the trench and down the natural topographical gradient; • Pipelines crossing drainage areas, should preferably span the drainage lines above ground. This prevents disruptions to sub surface flow dynamics and allows the pipeline to be monitored for leaks. Pipelines buried underground should be buried at a sufficient depth. below ground level such that the pipelines do not interfere with surface water movement or create obstructions, where flows can cause erosion; • When a pipeline spans a drainage line or watercourse, it should be attached to any existing crossing or bridge structures. This			

	will limit the need to disturb new areas of the system with the construction of new structures; • The pipeline must be attached to existing infrastructure at all crossing structures, where the pipeline is not aligned with infrastructure it must be re-aligned to follow existing infrastructure; • If pier support structures are needed for the pipeline to span a wide watercourse, then piers should be placed outside of preferential flow paths, preferably outside the delineated riparian zone with the least number of pier structures used as possible; • Pre-cast structures should be made use of (where possible) to avoid the mixing of these materials on site, reducing the likelihood of cement in the systems; • During the excavation of trenches, flows should be diverted around active work areas where required. Water diversion must be temporary and re-directed flow must not be diverted towards any stream banks that could cause erosion; and • The pipeline should be regularly inspected (quarterly) for any signs of failure, damage or leaks. Adequate maintenance measures need to be implemented upon finding pipeline issues and failures.			
Top soil	• Top soil removed during the excavations must be kept to one side (stored more than 32m from all watercourses). • This must then be re-used for rehabilitation purposes. Soil must be replaced in the same area that it was excavated from. Much of this topsoil, especially the top 30cm will retain grass and vegetation seeds. • Soil stockpiles must not exceed 2m in height, must be covered, or grassed to prevent erosion caused by exposure to heavy wind or rain.	CON/ EO		

Vegetation clearing and planting	• Only vegetation within the development footprint may be cleared. Any vegetation clearing must be done under the supervision of the ECO and Engineer. • No non-indigenous garden variety plants must be used.	CON/ EO		
Alien vegetation control	• On-going (monthly) control of alien vegetation within the construction area must be maintained.	CON/ EO		
	• An alien eradication program must be in place to control the spread of alien invasive species on site.	CON/ EO		
Cultural and Heritage items	• Should any items with historical or archaeological value be found during construction, these must be reported to AMAFA and work in the affected area must be stopped immediately.	CON		

3.4 Soil, Stormwater Runoff; Erosion				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Stormwater system	• Temporary stormwater protection measures must be established before construction activities commence.	CON		
	• No contaminated runoff or grey water is allowed to be discharged from the Site Camps into the watercourses or surrounding environment.	CON		
	• Storm water must not be allowed to flow into surrounding properties and must enter existing stormwater channels.	CON		
Storm water Quality	• Only clean stormwater may be diverted to the Watercourses and then precautions must be in place to prevent erosion of the riverbanks. These precautions can include gabion baskets, berms or diversion ditches, and sandbags.	CON		
	• Washings from any vessels or any containers must not enter the Watercourses or storm water. These washings are to be contained and removed as waste.	CON		
Incidents	• Entry of any substance (i.e. any material or substance that is not clean stormwater) into the storm water or a water body is considered an incident and must be reported to the ECO	CON/ EO		

	immediately for the purposes of maintaining the site's incident records.			
Storm water flow	• The drainage system must be regularly checked to ensure an unobstructed water flow. • Channelled flow must not be permitted to enter the Watercourses where it erodes the banks and damage the streams.	CON		
Erosion Control	• Install erosion barriers (gabion baskets, berms or diversion ditches, sandbags) and other sediment control structures (grates or grids, geofabric) before clearing in order to prevent substances from entering exposed drains or channels.	CON		
	• Identify any steeper areas where erosion is more likely to occur. These areas must be protected from erosion. This can be achieved through planting of vegetation, placement of berms or use of hessian material.	CON/ EO		
	• Regularly check and clean material from behind erosion barriers.	CON/ EO		
	• Sediment / soil must not be permitted to enter the Watercourses. The contractor must install erosion barriers (gabion baskets, berms or diversion ditches, sandbags) and other sediment control structures (grates or grids, geofabric).	CON/ EO		

3.5 Housekeeping, Waste Storage Handling and Disposal				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
General Waste Storage	• The waste area to be designated and demarcated within the construction camp (as per section 3).	CON		
	• Solid waste must be stored in covered, tip proof metal drums to be collected and disposed of by a certified waste contractor. • Proof of safe disposal of solid waste must documented and these records must be maintained on site for review by EDTEA.	CON		

Hazardous waste	• Hazardous materials that require disposal (cement, paints, solvents, old fuel/oil etc.) must be disposed of at a registered hazardous landfill site.	CON		
	• These materials must be removed by a hazardous waste contractor. Proof of disposal must be available to the ECO for scrutiny and kept on record. • Proof of safe disposal of solid waste must documented and these records must be maintained on site for review by EDTEA.	CON		
Waste from Chemical toilets	• Install chemical toilets and insure disposal of waste at a licenced disposal facility. Proof of disposal must be kept on site at all times.	CON		
	• Waste from the toilets must be collected on a weekly basis by a registered and reputable company.	CON		
	• Safe disposal certificates for toilet waste must be obtained and kept on site as assurance that the waste was properly disposed of.	CON		
	• Toilets must not be situated on slopes or within 32m of any watercourse and must be secured to prevent them tipping over.	CON		
	• Staff must use facilities provided and are not permitted to use any other areas on site as toilet facilities.	CON		
	• Chemical toilets must be checked daily and cleaned.	CON		
Waste storage and handling	• No waste may be buried or burned on site or dumped on surrounding properties and farmland. All waste must be disposed of at a licences waste disposal facility. Proof of disposal must be kept on site at all times.	CON		
	• All skips must be covered to contain odours and prevent waste from blowing around the site.	CON		
	• A register of all waste generated and disposed of must be maintained.	CON/EO		
	• No dumping is permitted. There must be no dumping on site under any circumstances. The contractor is liable to a fine should there be any evidence of illegal dumping. • The ECO to review damage and advise on rehabilitation measures if required.	CON		

	• Do not place waste containers, skip bins or building materials on steep slopes or within 32m of the stream.	CON/EO		
	• Waste accumulated on site must be removed on a weekly basis. The waste must be moved to a licenced waste disposal facility.	CON		
	• Provide litterbins throughout the site for use by all staff on site.	CON		
Waste separation	• **Hazardous:** Hazardous waste must be stored separately from general waste. ○ Hazardous waste must be disposed of at an approved hazardous waste landfill and safe disposal certificates must be obtained. ○ Hazardous waste includes used oils, lubricants, solvents, solvent based paints, concrete waste, and cement.	CON/EO		
	• **Oils** must be within a bunded storage area and treated as flammable waste. ○ Where possible used oils must be recycled. ○ Safe disposal certificates must be kept on site demonstrating disposal or recycling of the used oils. ○ Solid paint waste may be disposed of as general waste.	CON/EO		
	• **Concrete waste:** ○ Return excess concrete with the delivery truck to supplier for recycling or proper disposal. ○ Any other excess concrete i.e. on-site mixed concrete can be stored in a lined bin for eventual recycling or disposal.	CON/EO		

3.6 Noise				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Noise Generation and suppression	• All construction vehicles must be fitted with standard silencers and be well maintained.	CON		

	• Workers must be trained regarding noise on site and construction hours must be kept to working hours (07h00 to 17h00).	CON		

3.7 Dust & Emissions				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Dust from stockpiles	• Cover any stockpiled fine material that may release dust with plastic.	CON		
Dust from surfaces	• Damp down surfaces and stockpiles as required to reduce windblown dust.	CON		
	• A water cart may be used which must remain on designated roadways if required.	CON		
	• If dust from the site is likely to create problems for nearby residents, these areas must be shielded with shade cloth.	CON		

3.8 Vehicle Maintenance, Operation, Driving On Site and Vehicle Washing				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Access points	• Haulage roads must be demarcated at site set up.	CON		
	• Turning areas must be located within the construction footprint and must be clearly designated.	CON/ EO		
	• Temporary access roads must not be located within adjoining properties.	CON/ EO		
	• No ad hoc haulage roads or turning areas may be created.	CON/ EO		

	• Limit vehicle entry point to the designated access point and ensure no other point of entry is used.	CON/ EO		
	• All vehicles to remain in the parking area designated within the construction site.	CON/ EO		
Vehicle servicing and repairs	• No major equipment or vehicle servicing to occur on site i.e. major disassembly and repair work, clutch replacements and oil or lubricant changes must be carried out at a suitably equipped workshop.	CON		
	• Only minor emergency repairs, i.e. those necessary to get the vehicle moving so that it can be taken to a repair facility to be carried out i.e. stopping of oil leaks, lubricating of hydraulics, changing of buckets / breakers on Excavators and TLBs or changing of tyres. This must be carried out in designated work shop areas within the allowed construction camps. These areas to be hard surfaced and bunded.	CON		
	• Drip trays are to be used by all leaking vehicles and equipment.	CON/ EO		
	• All vehicles to be equipped with drip trays.	CON/ EO		
	• All small machinery used on site must be situated on a drip tray (i.e. pumps, generators, compressors etc.).	CON/ EO		
	• All vehicles to be regularly maintained and maintenance records must be made available on request.	CON/ EO		
	• No leaking vehicles to be allowed on site.	CON/ EO		
	• Any vehicles that are leaking must not be allowed entry to site.	CON/ EO		
	• No vehicles to be washed on site - cement trucks are not permitted to wash out cement mixers on site.	CON/ EO		

	• Only emergency (breakdown where equipment is no longer mobile) and minor maintenance (e.g. greasing) may be done on site. Any other planned or required maintenance must be done offsite at a suitable location.	CON		

3.9 Incidents, Spills and Emergency Response				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Spill kits	• Adequate spill kits and containers for spilled and contaminated material to be on standby on site.	CON/EO		
	• Keep clearly marked booms and/or absorbent material on site to contain spills if they occur.	CON/ EO		
	• All staff must be trained on how to react in the case of an emergency.	CON-SHE		
	• If a spill occurs, stop the source, contain it, clean up in accordance with MSDSs and notify relevant authorities.	CON/ EO		
	• Make staff aware of emergency phone numbers to use in the case of a large spill.	CON/ EO		
Definition of incidents	• All incidents are to be recorded.	CON/ EO		
	• **Minor incidents**: small spills less than 5 l that do not enter stormwater or the stream/river, minor non-compliance with EMPr that does not cause major environmental impact i.e. housekeeping issues etc. ○ **Action:** Supervisor and staff on site to record and address and notify ECO. Take photos of spill. Prevent spill from spreading and contain. Collect spilled material and contaminated soil and place in sealed container for disposal. ECO to advise on remediation measures and to follow up on actions taken to address incident.	CON/ EO		

	○ **Records:** On site incident register.			
	• **Major incidents:** Large spills or any spills that enter stormwater or the stream/river, fires, explosions. Please see definition of a reportable incident provided below. ○ **Action:** Report immediately to ECO, action to be taken to prevent further damage and incident to be reported to authorities. ECO to advise on remediation measures and to follow up on actions taken to address incident. ○ **Records:** On site incident register and report to authorities.	CON/ EO		

3.10 Sewage and Grey Water Management				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Sewage	• Adequate toilet facilities (such as chemical toilets) sufficient in number to cater for the number of staff on site must be provided. One toilet per 15 staff must be provided.	CON		
	• Waste must be managed as per section 3.5 namely removed by licensed contractor and safe disposal certificates retained to prove proper disposal. • Safe disposal certificates must be kept on site for review by the EDTEA.	CON/ EO		
Grey water / wash water	• Grey water must not be permitted to enter the surrounding properties or stormwater.	CON/ EO		
	• Vehicles, especially cement trucks, must not be washed on site these must be washed at a wash bay facility off site.	CON/ EO		
	• Alternately the wash water can be collected and returned with the supplier's truck for disposal by the supplier.	CON/ EO		

SECTION 4 POST CONSTRUCTION, REHABILITATION AND OPERATION

4.0 Post Construction Activities

Activity	Required Action / remediation to control environmental impact	Person	In place (Yes / No)	Comments
Post Construction Audit	• Clearance from the ECO must be obtained to ensure the all of the requirements of the EMPr have been complied with.	ECO		
Stormwater	• The Contractor must check that the stormwater channels are free from building rubble, spoil materials, and waste materials.	CON		
	• Ensure that in the long term; stormwater is protected from ingress by potential pollutants.	CON		
Waste & Spills	• All spillages must be cleaned and contaminated soil must be removed and disposed.	CON/ EO		
	• All remaining waste bins and / or skips must be removed and disposed of. Records of disposal must be retained.	CON/ EO		
	• All excess concrete must be removed from site on completion of works and disposed of. Washing of the excess into the ground is not allowed.	CON/ EO		
	• All excess aggregate must also be removed.	CON		
	• Used oil must have been collected by a registered used oil contractor and documentation to this effect provided.	CON		
	• Surfaces are to be checked for waste products from activities such as concreting are cleared in a manner approved by the ECO.	CON		
	• No litter must be left on site.	CON/EO		
Structures, materials and stockpiles	• Any fences, barriers, or demarcations utilized for the construction phase must be removed and disposed of.	CON		

	• All structures and imported materials within the construction camp must be removed.	CON		
	• The remaining building materials must be removed from the site.	CON		
Damage	• Any damage incurred on the neighbouring homesteads by the contractor must be repaired by the contractor.	CON		
	• Any damage to existing infrastructure must be repaired or replaced on completion of the upgrade.	CON		
Close Out	• A meeting must be held between Engineer, the ECO, and the contractor to approve all remediation activities and ensure that the site has been restored to a condition, which has been approved by the Engineer.	ENG		
Vegetation	• All vegetation planting must be completed and any areas that have been disturbed or cleared must have been rehabilitated and re vegetated.	ECO		
	• Re-vegetation of cleared land must utilize only 100% locally indigenous plant material to ensure no erosion occurs once the site is vacated.	CON/EO		
	• Ensure that no sensitive habitats have been damaged during the construction phase.	ECO		
	• Where habitats have been damaged these must be reported to the ECO and procedures for rehabilitation of these habitats must be undertaken.	CON/EO		
Erosion	• Any eroded soil on paths / roadways / other areas must be collected and replaced in the area from which it was eroded. These high risk erosion areas must be protected from further soil erosion.	CON/EO		

4.1 Rehabilitation				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Rehabilitation of the excavated pipeline route and site camps.	• Cleared areas to be re-grassed on completion. Indigenous grasses to be used and the use of vetiver or kukuyu grass is not supported. Rather an indigenous grass seed mix must be used to rehabilitate the site. Species within this mix should include *Urochloa panicoides* (Garden Signal Grass), *Pogonarthria squarrosa* (Herringbone grass), *Eragrotis curvula* (Weeping Love Grass) and *Chloris gayana* (Rhodes Grass). • Compacted cleared areas (site camps) must be ripped to allow for vegetation regrowth. • Where possible, vegetation that was removed during clearing must be kept aside and re-used. This can be kept on site in nursery areas or if the replanting occurs within a few days of clearing, can be kept to one side and immediately re-planted. • Grass can be reintroduced by Hydroseeding or planting of grass plugs. • Where serious habitat damage has taken the damaged must be reported to the ECO. Consultation between the ECO, contractor, and engineer must take place. Whereby the contractor must develop and suitable method statement which must focus on the rehabilitation of the damaged area. This method statement must be approved by both the ECO and engineer. The contractor must then implement this method statement under the supervision of the ECO.	CON/ EO		
Top Soil	• Top soil removed during the excavations must be kept to one side (stored more than 32m from Watercourses) and re-used in the same area that it was excavated from. Much of this topsoil, especially the top 30cm will retain grass and vegetation seeds. • This top soil to be used when re-vegetating and rehabilitating areas cleared for construction/ excavation.	CON/ EO		
Rehabilitation of eroded areas	• Any erosion damage caused during construction must be repaired. The affected area must be reshaped and soil replaced. • The eroded area must be re-vegetated or measures put in place to control further erosion. The contractor must install erosion	CON/ EO		

	barriers (gabion baskets, berms or diversion ditches, sandbags) and other sediment control structures (grates or grids, geofabric).			
Removal of alien invasive plants	• Alien invasive species must be removed on an on-going basis. • Use of chemical pesticides must be avoided and mechanical removal by hand is preferred.	CON/ EO		
Damage to the Watercourses	• Where the Watercourses have been damaged the following measures are to be taken to ensure restoration of the habitat: ○ ECO must assess the damaged area ○ Any construction debris or contaminants within the Watercourses must be removed ○ Original soil structure must be restored ○ Any impedance or diversion to waterflow must be removed ○ Area must be vegetated with suitable riparian or wetland species • No loose soil or damaged banks can be left behind after construction.	CON/ EO		

4.2 Operation				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Soil Erosion	• The erosion protection features installed on the site must be checked to ensure, they continue to perform their function during the operational phase of the project.	APP		
Vegetation	• Alien vegetation must be monitored and removed on an on-going basis. • Indigenous vegetation planting must continue on an on-going basis if it is required.	APP		

SECTION 5 DEFINITIONS

Stormwater
Clean rainwater, must be allowed to enter the stormwater system or natural water bodies without causing erosion. Stormwater must not be contaminated with any other substance including soaps, washings, hazardous materials, soil etc.

Grey water
This is wash water that may contain non-hazardous soaps i.e. bath water, vehicle wash water etc. This must not be permitted to enter the stormwater system but can be disposed of in the sewage system or as effluent. If no sewage system is available on site the grey water must be collected and disposed of.

Sewage
Human excrement from chemical toilets.

Raw materials for which source statement must be obtained
Topsoil, sands, natural gravels, crushed stone, asphalt, clay liners, timber etc. E.G.: sand may only be obtained from an approved sand winning operation, which is licensed and has an approved EMPr for operation.

Incidents
All incidents must be recorded. Minor incidents could include small spills of less than 5l that do not enter a water body or any stormwater drains, as well as housekeeping issues and general small non-compliances with the requirements of the EMPr. Major incidents are those that must be reported to the authorities and include all incidents involving contamination of a water body or stormwater or other reportable incidents as defined below.

Reportable incident is defined as ‘an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed’ NEMA Section 30, ‘includes any incident or accident in which a substance (a) pollutes or has the potential to pollute a water resource; or (b) has, or is likely to have, a detrimental effect on a water resource.’ NWA Section 20.

SECTION 6 RECORDS

Training Register – Record any training that has taken place.		
Training Conducted:		
Training provided by:		
Date of Training	**Name**	**Signature**

Non-conformance Record – Record any non-conformances i.e. small spills, overflowing waste bins etc.				
Date of Non conformance	**Details of non-conformance**	**Mitigation required**	**Corrective action taken**	**Date action completed**

Complaints register – Record any complaints received from neighbours or the public regarding dust or pollutions, noise or nuisance.					
Date of complaint	**Complainant's Name**	**Complainants Contact Number**	**Details of complaint**	**Corrective action taken**	**Date action completed**

Environmental Emergency Response and Definition of an Incident

Aim of this document	• To effectively manage response to emergency incidents and control these incidents should they occur. • To ensure that such incidents are recorded and, where possible, all measures are taken to prevent them from re-occurring. • To provide a definition for what would be considered a reportable incident in terms of the environmental legislation. Activities covered in this procedure include: • Identification and definition of an incident and whether or not it needs to be reported to the authorities. • Reporting to the relevant authorities in the event that a reportable incident occurs • Procedure to follow in the event of a spill or fire.
Personnel Duties and Responsibilities	The contractor is responsible for: • Ensuring all activities are carried out as per this procedure and that the company complies with relevant legislation. • Maintaining a register of all incidents as well as ensuring that an incident report is generated for each incident, including details of the incident and how it was closed out. • Ensuring that safe disposal certificates are obtained for any waste materials generated as a result of an incident and that this waste is recorded. • Providing the necessary spill kit equipment and drums for storage of contaminated soil etc.
Training Requirements	• All personnel and manpower to undergo a site safety and environmental induction prior to starting work on site. All employees to be trained on how to respond to an environmental incident and who to contact in order to ensure that the incident is addressed and recorded and if necessary reported.
Definition of a "reportable incident"	• In terms of the National Environmental Management Act, major incidents must be reported to the authorities. In terms of the National Water Act, any incident involving a substance which has the potential to pollute a water resource must be reported i.e. any spill of into a watercourse or into the stormwater system must be reported. The relevant sections from the legislation are provided below:
National Environmental Management Act	*As defined by NEMA, section 30 "Control of emergency incidents".* *(1) In this section—* *(a) "incident" means an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed;* *(b) "responsible person" includes any person who—* *(i) is responsible for the incident;* *(ii) owns any hazardous substance involved in the incident; or* *(iii) was in control of any hazardous substance involved in the incident at the time of the incident;* *(c) "relevant authority" means—*

	(i) a municipality with jurisdiction over the area in which an incident occurs; *(ii) a provincial head of department or any other provincial official designated for that purpose by the MEC in a province in which an incident occurs;* *(iii) the Director General;* *(iv) any other Director General of a national department.*
National Water Act	*As defined by the National Water Act section 20 "Control of emergency incidents"* *(1) In this section ``incident'' includes any incident or accident in which a substance -* *(a) pollutes or has the potential to pollute a water resource; or* *(b) has, or is likely to have, a detrimental effect on a water resource.*
Reporting to the authorities	In the event that a reportable incident occurs, the Site Agent / Project Manager and Environmental Control Officer must be notified immediately. No site staff may communicate directly with the authorities. The relevant sections from the legislation are included below: As taken from NEMA, section 30: Control of Emergency Incidents: *(3) The responsible person or, where the incident occurred in the course of that person´s employment, his or her employer must forthwith after knowledge of the incident, report through the most effective means reasonably available—* *(a) the nature of the incident;* *(b) any risks posed by the incident to public health, safety and property;* *(c) the toxicity of substances or byproducts released by the incident; and* *(d) any steps that should be taken in order to avoid or minimise the effects of the incident on public health and the environment to—* *(i) the Director General;* *(ii) the South African Police Services and the relevant fire prevention service;* *(iii) the relevant provincial head of department or municipality; and* *(iv) all persons whose health may be affected by the incident.* *(4) The responsible person or, where the incident occurred in the course of that person´s employment, his or her employer, must, as soon as reasonably practicable after knowledge of the incident—* *(a) take all reasonable measures to contain and minimise the effects of the incident, including its effects on the environment and any risks posed by the incident to the health, safety and property of persons;* *(b) undertake cleanup procedures;* *(c) remedy the effects of the incident;* *(d) assess the immediate and long term effects of the incident on the environment and public health.* *(5) The responsible person or, where the incident occurred in the course of that person´s employment, his or her employer, must, within 14 days of the incident, report to the Director General, provincial head of department and municipality such information as is available to enable an initial evaluation of the incident, including—* *(a) the nature of the incident;* *(b) the substances involved and an estimation of the quantity released and their possible acute effect on persons and the environment and data needed to assess these effects;* *(c) initial measures taken to minimise impacts;*

	(d) causes of the incident, whether direct or indirect, including equipment, technology, system, or management failure; and *(e) measures taken and to be taken to avoid a recurrence of such incident.* *(6) A relevant authority may direct the responsible person to undertake specific measures within a specific time to fulfil his or her obligations under subsections (4) and (5): Provided that the relevant authority must, when considering any such measure or time period, have regard to the following:* *(a) the principles set out in section 2;* *(b) the severity of any impact on the environment as a result of the incident and the costs of the measures being considered;* *(c) any measures already taken or proposed by the person on whom measures are to be imposed, if applicable;* *(d) the desirability of the State fulfilling its role as custodian holding the environment in public trust for the people;* *(e) any other relevant factors.* *(7) A verbal directive must be confirmed in writing at the earliest opportunity, which must be within seven days.* *(8) Should—* *(a) the responsible person fail to comply, or inadequately comply with a directive under subsection (6);* *(b) there be uncertainty as to who the responsible person is; or* *(c) there be an immediate risk of serious danger to the public or potentially serious detriment to the environment, a relevant authority may take the measures it considers necessary to—* *(i) contain and minimise the effects of the incident;* *(ii) undertake cleanup procedures; and* *(iii) remedy the effects of the incident.*
National Water Act section 20: Control of emergency incidents	*(2) In this section, ``responsible person'' includes any person who -* *(a) is responsible for the incident;* *(b) owns the substance involved in the incident; or* *(c) was in control of the substance involved in the incident at the time of the incident.* *(3) The responsible person, any other person involved in the incident or any other person with knowledge of the incident must, as soon as reasonably practicable after obtaining knowledge of the incident, report to -* *(a) the Department;* *(b) the South African Police Service or the relevant fire department; or* *(c) the relevant catchment management agency.* *(4) A responsible person must -* *(a) take all reasonable measures to contain and minimise the effects of the incident;* *(b) undertake clean-up procedures;* *(c) remedy the effects of the incident; and* *(d) take such measures as the catchment management agency may either verbally or in writing direct within the time specified by such institution.*

Spill response	
Responsible Person/s	The spill is reported to the site foreman who must notify his superior. All employees must be made aware of the procedure in case of a spill.
Procedure	1. Identify nature of spill e.g. paint, oil or lubricants 2. Locate spill kit 3. Contain spill according to the training provided 4. Where necessary, contact external spill control contractors 5. Ensure spill does not cause any external contamination (such as storm/ground water or soil) 6. Ensure that cleanup measures are taken if any contamination has occurred 7. Record in emergency response record the: • Nature of incident • Cause of incident • Clean up measures • Mitigation measures taken 8. Record in non-conformance register 9. The ECO and Project Manager will determine if the event qualifies as an incident and take steps to report the incident to the necessary authorities i.e. EDTEA and DWA. 10. The ECO shall review all spill reports
Fire	
Responsible Person/s	The fire is reported to the site foreman All employees must be made aware of the procedure in case of fire.
Procedure	1. Identify source and nature of fire. 2. In case of small fire extinguish with material appropriate to the nature of the fire 3. In case of a large fire contact Fire Department 4. In the site camp, seal off exposed stormwater drains to ensure firewater does not cause any external contamination. If on site, take measures to prevent firewater entering any water body. 5. Ensure that clean-up measures are taken if any contamination has occurred 6. Record in emergency response record the: • Nature of incident • Cause of incident • Clean up measures • Mitigation measures taken 7. Record in non-compliance register 8. The ECO and Project Manager will determine if the event qualifies as an incident and take steps to report to the authorities. 9. The EO shall review incident / nonconformance reports 10. Adjustments will be made, if necessary, to the operational and emergency procedures and the Environmental Management System to prevent future occurrences

Explosion	
Responsible Person/S	The explosion is reported to the site foreman who must notify his superior. All employees must be made aware of the procedure in case of explosion.
Procedure	1. Identify source and nature of explosion. 2. In case of small fire as a result of the explosion, extinguish with material appropriate to the nature of the fire 3. In case of a large fire as a result of the explosion contact Fire Department 4. In the site camp, seal off exposed stormwater drains to ensure firewater does not cause any external contamination. If on site, take measures to prevent firewater entering any water body. 5. Ensure that clean-up measures are taken if any contamination has occurred 6. Record in emergency response record the: • Nature of incident • Cause of incident • Clean up measures • Mitigation measures taken 7. Record in non-compliance register 8. The ECO and Project Manager will determine if the event qualifies as an incident and take steps to report the incident to the necessary authorities i.e. EDTEA and DWS. 9. The ECO shall review spill reports
Resource Requirements	
Materials	• Separate drums for contaminated soil. • Spade and clean soil • Fire equipment

Alien Plant Control Plan

Alien Plant Control Plan	
Activity	**Site Mitigation Measures to control alien plants**
Training and expertise of personnel involved in Alien plant management on site	• It is rare that either a contractor has employees or members respectively with good knowledge of alien plants and their eradication, who can then eradicate these plants effectively and on a near-complete basis. Partial knowledge means that some alien species are missed or ignored or indigenous plants harmed. Partial work, or work that is not sustained is also ineffective in the long run as any residual presence can regenerate and expand quickly, particularly if live material or many seeds still in the ground. • As a result, the contractor must continually train their workers as to the importance of alien plant control and at the same time providing them with the correct knowledge as to which plant must be removed and what method must take place.
Alien Invasive Plant Management in construction area	• The construction area must be kept free of alien invasive plants. Regular inspections of the site must take place. The following methods of alien plant control can be adapted: o Mechanical Control ▪ Hand pulling ▪ Manual removal using hand tools ▪ Manual removal using mechanised tools o Chemical Control ▪ Foliar spraying ▪ Handheld spraying ▪ High pressure spraying • The construction area must be rehabilitated immediately following the completion of construction to ensure that alien invasive plants do not become established. • The construction area must be regularly inspected following rehabilitation and alien invasive plants removed if they have become established.
Responsible Use of herbicides	• Problem plants in construction areas usually short-lived weeds for which mechanical methods alone are not successful some use of herbicides may be unavoidable. The following must be followed with the use of herbicides: o Do not spray herbicides in windy conditions o Preferably spray in dry conditions and not prior to any predicted heavy rainfall as most pesticide movement either to the surface or to the groundwater will occur in the first major storm event after application. Heavy losses are reported when application occurs immediately before a major storm. o A buffer zone which must remain untreated must be retained around Watercourses. A minimum buffer of 10m must be retained. This are will have to be managed by mechanical means. o Empty containers or unused herbicides must be disposed of correctly and may not be dumped on site.