



IN ASSOCIATION WITH INKANYEZI YETHU



**NOVEMBER 2022
ENVIRONMENTAL MANAGEMENT PROGRAMME
RICHARDS BAY WATERFRONT REZONING AND
REDEVELOPMENT
CITY OF UMHLATUZE
EIA REF: DC28/0007/2022**

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SECTION 1: INTRODUCTION, PROJECT AND SITE DESCRIPTION

1.1. Background

The City of uMhlatuze has applied for an Environmental Authorisation in support of the SPLUMA application to rezone the existing Richards Bay Waterfront. The area is located within Ward 2 of the City of uMhlatuze and King Cetshwayo District Municipality.

1.2. Scope of Work

Prepare a site-specific EMPr for the Richards Bay Waterfront Rezoning and Redevelopment to manage and mitigate potential environmental impacts during construction and operation. 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 guide all contractors and site workers on how to operate responsibly 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 and operational periods.
- 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 to avoid environmental impacts and meet the legislated requirements.

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 (City of uMhlatuze) 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 per 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 is responsible for:

- Appointing a qualified contractor and ensuring that they have read and understood the EMPr and Environmental Authorisation (EA).

- Ensuring all work undertaken is per the EMPr and EA.
- 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 daily to ensure compliance with the EMPr and EA.
- Overall responsibility and accountability for the site during the construction phase.
- Mitigating impact on the environment through responsible operation and adherence to the EMPr and EA.
- Ensuring transparency in their operation and environmental management of the site.
- Managing the contractor to ensure that they adhere to the EMPr and EA and ensuring that all necessary documentation is maintained on-site.
- Ensuring that the contractor has a copy of the EMPr, EA 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 and EA.
- Operating per 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 the 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 authorisation.
- Undertaking the mitigation measures to address the 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 regularly 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 pertaining to the requirements of the EMPr and EA.

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

- Conducting regular auditing against the requirements of the EMPr and EA.
- 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 the 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 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:

- The Constitution of South Africa (No. 108 of 1996)
- National Environmental Management Act (Act 107 of 1998)
- National Water Act (Act 36 of 1998)
- National Environmental Management: Waste Act (Act 59 of 2008)
- National Environmental Management: Air Quality Act (Act 39 of 2004)
- National Environmental Management: Protected Areas Act (Act 57 of 2003)
- National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008)
- National Forest Act (Act 84 of 1998)
- Environmental Conservation Act (Act 43 of 1996)
- National Environmental Management: Biodiversity Act (Act 10 of 2004)
- National Heritage Resources Act (Act 25 of 1999)
- KwaZulu-Natal Heritage Act (Act 4 of 2008)
- Mineral & Petroleum Resources Development (Act 28 of 2002)
- Occupational Health and Safety Act (Act 181 of 1993)
- Hazardous Substances Act (Act No. 15 of 1973)
- National Building Regulations and Building Standards Act (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. The 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 a comment about any problems noted.

1.8. Project Details

The City of uMhlatuze have applied for an Environmental Authorisation in support of the SPLUMA application to rezone the existing Richards Bay Waterfront. The area is located within Ward 2 of the City of uMhlatuze and King Cetshwayo District Municipality. This proposal aims to fulfil the goal of the applicant, City of uMhlatuze, to redevelop the Richards Bay Waterfront in order to maximise usage and unlock economic potential while opening the area for further use by tourists and locals. The study area is located along the uMhlatuze River Estuary within the suburb of Meerensee.

The current study area is already partially developed and is made up of a mix of land uses which includes the following:

- Recreational land uses such as marine clubs
- Institutional land uses such as NSRI
- Municipal facilities
- Government/parastatal land uses such as Transnet
- Water utilities
- Active open space uses such as beach facilities.
- Open indigenous vegetation

The current designated land uses as per the City of uMhlatuze town-planning scheme for the study area have been indicated in Figure 3 and have also been listed below:

- Undetermined
- Harbour Resort
- Waterfront Residential
- Conservation

The main work associated with the project is to rezone the entire project area to allow for the development of the waterfront to include new sites to support a number of different land uses, these are as follows (Table 1), please also refer to Figure 1:

Table 1: Proposed Facilities

Proposed Land Uses	Proposed Zoning	No. of Erven	Site Area (m ²)	Total Developable Area (m ²)
Holiday Apartments	Resort 2	7	33 234	23 264
Hotel And Resort	Resort 2	1	39 166	27 416
Mixed Used	Medium Impact Mixed Use	10	107 798	107 798
Mixed Used (Alkantstrand)	Special Mixed Use	6	16 796	11 757
Commercial	Medium Impact Mixed Use	6	28 795	28 795
Office (Alkantstrand)	Office 2	7	22 628	18 102
Institution (Nsri)	Medium Impact Mixed Use	1	9 796	9 796
Institution	Hotel	1	5 116	3 070
Municipal (Community Hall)	Municipal And Government	1	17 972	10 783
Municipal Interpretation Centre	Municipal And Government	3	23 229	13 937
Parking Area	Public Parking And Parkade	1	8 241	8 241
Maritime Museum	Education	2	11 979	11 979
Water Dependant Uses	Harbour Resort	2	13 159	13 159
Sport Precinct	Active Open Space	1	11 222	11 222
			Total	299 319

According to the project engineer, the existing infrastructure will be insufficient in supplying all services required for the proposed development. The upgrading of existing services and the extension of existing networks by constructing new infrastructure will be required.

A number of existing roads are located within the development footprint and therefore the preferred layout has made use of these roads as far as practically possible. The table below provides a list of all the existing roads to be incorporated into the development with the current and future planned Road Classification. No watercourse crossings are required for any road within the project area.

Table 2: Road Classification

ROAD CLASSIFICATION		
Road Name	Current Classification	Future Classification
Bayview Boulevard	Class 3	Class 3
Bridge Town Road	Class 3	Class 3
Commodore Close	Class 4	Class 4
Ocean Edge	Class 3	Class 3
Davidson Lane	Class 3	Class 3
Van Rooyen Way	Class 4	Class 4
Challenor Ridge	Class 4	Class 4
Hibberd Drive	Class 3	Class 3
The Gully	Class 4	Class 4
Launder Lane	Class 4	Class 4
Trapie Truter Drive	Class 4	Class 4

There are a number of unnamed gravel roads with approximate widths of 5m within the project footprint that will also be upgraded to form part of the development, these roads will be upgraded to Class 4 roads. The proposed typical cross-section for a Class 3 road with a pedestrian walkway will consist of an undivided two-way, two-lane road with an asphalt surface. The total roadway width will be 9.4 m – 10.4 m. The proposed typical cross-section for a Class 4 road with a pedestrian walkway will also consist of an undivided two-way, two-lane road with an asphalt surface. However, the total roadway width will be 8.8 m – 9.8 m. Both road classes will have a paved 1.5 m wide pedestrian walkway on both sides of the roadway.

As per the Traffic Impact Study¹ a number of intersections within the study area will require an upgrade, these are as follows:

- Commodore Close / Bridgetown Road;
- Bayview Boulevard / Bridgetown Road;
- Hibberd / Davidson Lane;
- Anglers / Krewelkring;

¹ Hamatino Consulting Engineers (2021) Traffic Impact Study

- Bayview Boulevard / Davidson Lane.

These upgrades vary from intersection to intersection and involve the addition of new turning lanes and improved signage.

An internal water borne sewer reticulation network will be provided to drain sewer from individual stands within the development area. The following standards have been used during the design, *Guidelines for Human Settlement Planning and Design* and *Industry accepted hydraulic principles*. The proposed water borne sewer reticulation network will consist of the following:

- Existing bulk sewer infrastructure and drainage networks exist within and in close proximity to the proposed development. The design of new infrastructure will endeavour to utilise the existing infrastructure as far as practically possible.
- The sewer will be pumped from the sewer pump stations via common rising mains to the existing main municipal macerator and pump station.
- A number of existing pump stations are located throughout the site. Where possible these pump stations will be integrated into the proposed new network. However 10 new pump stations with common rising mains will be constructed to pump the sewer from the new sewer reticulation networks to the existing main municipal macerator and pump station. Each pump station will consist of an inlet works, flow buffer sump and a pump station building.
- The sewer reticulation network will be installed with a minimum pipe size of 160 mm. All pipes will be PVC Class 34. Sewer reticulation pipes will be placed at a 1.25 m offset on the inside or outside of the stands depending on practice in the area and availability of space within the road reserve. Due to the flat terrain and low elevation above sea level pipe trenches will be designed to allow for at least 0.6 m cover over all pipes.
- All new sewer pump stations will require new rising mains. These rising mains will be installed with a minimum pipe size of 75 mm. Pipes will be mix of uPVC (over 100mm) and HDPE (under 100mm)
- No watercourse crossings are required for any sewer pipes within the project area.

A network of stormwater control and transport structures will be introduced to manage the flow of surface runoff within the development area. The following standards have been used during the design, *Guidelines for Human Settlement Planning and Design* and *The South African National Roads Agency SOC Limited – Drainage Manual*. To optimize the functional performance of the stormwater drainage system the road surface, stormwater pipe and channel networks will be designed as an integrated system as follows:

- The road surface and kerb will be utilized as open channel structures to capture and convey surface runoff to inlet structures.
- Pre-Cast concrete pipes with interlocking joints will be used for stormwater conveyance. The minimum pipe size allowed will be ND600. This size pipe ensures easier and more effective cleaning of pipes than smaller diameter pipes afford.
- Both pipe and box culverts will be used to transfer stormwater below the project areas roads.
- In-situ constructed concrete channels will be constructed to transport flow.
- All stormwater outlets will be of the wing wall type to overland flow. Energy dissipaters will form part of the outlet structure design to reduce the effects of scouring due to high flow velocities downstream of outlets. Outlet structures will allow free flow of water to avoid ponding which will lead to stagnant polluted water or possible drowning.
- No significant other developments or stormwater structures are directly downstream from this development. As a result, hereof no runoff attenuation is thus required.

An internal potable water reticulation network will be provided to distribute water between individual stands within the development area. The following standards have been used during the design, *Guidelines for Human Settlement Planning and Design* and *Industry accepted hydraulic principles*. The proposed water reticulation network will consist of the following:

- Varying uPVC pipes sizes and classes.
- The network will be designed to ensure a minimum pressure of 20 m to each stand during peak flow conditions, with a maximum static pressure of 90 m during low flow conditions.
- No water storage facilities will be constructed as part of the development.
- The planned water reticulation network will connect to an existing gravity main that traverses the site.
- No watercourse crossings are required for any water pipes within the project area.

1.9. 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	City of uMhalthuze		
Engineer/Project Manager			
Independent Environmental Practitioner	EnviroPro	Josette Oberholzer Iain Jourdan	031 765 2942
ECO			
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

1.10. Fines/Penalties

Fines/penalties will apply to the Contractors responsible for the maintenance or repair work, should they fail to comply with the provisions of the EMPr and EA. Penalties for non-compliance need to be discussed with the Contractor on appointment. The Contractor must make every effort to ensure that staff members comply with the EMPr, and enforce non-compliance penalties. Allowances must be made for the contractor to rectify all non-compliances, prior to issuance of penalties/fine.

The Contractor will comply with the requirements of this EMPr on an ongoing basis, any failure on their part to do so will entitle the Project Manager, in consultation with the ECO to certify the imposition of a fine. The value of the fine will be agreed between the Project Manager and ECO based on the nature, extent and duration of the offence and subsequent environmental damage and will be within the confines of the contractual arrangements. Such penalties shall be payable in addition to any remediation costs for correction of environmental damage as a result of noncompliance to this EMPr, that will also be for the Contractor's account. Time penalties may also be awarded by the contract's manager where the contractors do not comply. These details are to be included into the contracts.

The Contractor is deemed NOT to have complied with the EMPr if:

- a) Within the boundaries of the site, site extensions and haul/ access roads there is evidence of contravention of the EMPr confirmed and verified by the ECO;
- b) Environmental damage ensues due to non-compliance of EMPr requirements;
- c) The Contractor fails to comply with corrective or other instructions issued within a specific time;
- d) The contractor fails to comply with a site instruction given by the Engineer based on the ECO report;
- e) The Contractor fails to respond adequately to complaints from the public in line with requirements of this EMPr; and
- f) Legal action is instituted against the proponent in terms of Environmental laws.

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

Aspect	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
CONSTRUCTION IMPACTS					
A) Construction of the Richards Bay Waterfront within the EFZ (LN1 Activity 19A LN3 Activity 6, 14 and 18)	1) Direct Impact: The loss of 198129m ² undeveloped areas associated with the EFZ due to the construction of new facilities and infrastructure.	<p>During construction, there will be a loss of areas within the EFZ due to construction activities. The following measures must be carried out:</p> <ul style="list-style-type: none"> • Prior to construction, a baseline ecological assessment must be conducted. This baseline must flag species of concern and site-specific potential impacts. • A comprehensive monitoring programme must be established prior to construction and continue post construction. The monitoring plan must focus on disturbances of sediments, contamination of the estuary, and monitoring of sensitive ecological responders. Indicator species must be identified and monitored to assess the levels of disturbances to drivers within the estuary. The RQOs for the Richards Bay Estuary requires formalisation and management objectives should be incorporated into the monitoring plan. • The contractors used for the construction must have spill kits available prior to construction to ensure that any fuel, oil or hazardous substance spills are cleaned-up and discarded correctly; • Sensitive areas and those designated as conservation areas must be demarcated and buffers must be implemented to reduce impacts to these areas; • All construction activities must be restricted to the development footprint area. This includes laydown and storage areas, ablutions, offices etc.; • During construction activities, all rubble generated must be removed from the site; • Construction vehicles and machinery must make use of existing access routes; • All chemicals and toxicants to be used for the construction must be stored in a bunded area; • All machinery and equipment must be inspected regularly for faults and possible leaks, these must be serviced off-site; 	CON		
	2) Direct impact: The excavation of approximately 299319m ³ of material from within the EFZ will negatively impact the estuarine functionality.		CON		
	3) Indirect Impacts: Increased erosion leading to the deposition of sediment within the EFZ which will reduce water quality within the estuary.		CON		
	4) Cumulative Impact: Potential for reduced functionality for the wider EFZ.		CON		

Aspect	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
		<ul style="list-style-type: none"> • All contractors and employees must undergo induction which is to include a component of environmental awareness. • Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. These must be placed outside of freshwater/estuarine resources and associated buffers. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation); • All removed soil and material stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds; • Any exposed earth must be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil; • A comprehensive stormwater management plan is required to reduce potential impacts from sheet runoff from parking bays/areas and roof tops; • No dumping of construction material on site may take place; • All waste generated on-site during construction must be adequately managed. Separation and recycling of different waste materials must be implemented; • Post-construction rehabilitation of denuded areas must be implemented. Where possible, simultaneous revegetation and landscaping should occur post-construction at a site level; • Where possible, construction activities must be undertaken during the dry season to reduce potential erosion and runoff of hazardous substances. 			
	<p>5) Negative socio-economic impacts linked to the relocation of existing recreational facilities which have not been accounted for in the proposed layout.</p>	<p>This impact is unavoidable, as in order to achieve the aim of the applicant these existing recreational clubs/facilities will need to be removed/relocated. As it stands there have been no plans given to the EAP as to the way forward in dealing with these existing recreational clubs/facilities. However, the following measures must be implemented to ensure there is some level of mitigation:</p> <ul style="list-style-type: none"> • As part of the planning phase, the removal/relocation of these existing recreational clubs/facilities must be a key item to resolve. 	APP		

Aspect	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
		<ul style="list-style-type: none"> • Agreements/memorandum of understanding must be signed between both parties prior to any activities taking place on the ground. 			
B) Operation of vehicles and use of construction equipment within the EFZ. (LN1 Activity 19A LN3 Activity 6, 14 and 18)	6) Direct Impact: Poor control of construction vehicles resulting in damage to the identified wetland environments.	This impact can be completely mitigated as no construction is planned within any wetland area, the following measures must be carried out to mitigate unnecessary and preventable damage to wetland areas: <ul style="list-style-type: none"> • Wetland areas close to active construction sites must be specifically demarcated with snow netting to prevent the movement of workers into these areas. • No site staff or construction vehicles are permitted to enter these areas. • No laydown areas are permitted to enter these areas. 	CON		
	7) Direct Impact: Direct and cumulative damage to the wider EFZ areas outside of the construction footprint.	The following measures must be carried out to mitigate against potential damage to the wider EFZ during construction: <ul style="list-style-type: none"> • All areas not within the approved construction footprints must be demarcated as no-go areas. • Heavy vehicles and necessary plant must not excavate outside of the approved construction footprints. There must be no haphazard entry into / exit from the surrounding EFZ. i.e. construction plant and vehicles may only travel along approved access routes. • Construction must be prioritised and scheduled during the dry months (winter). • 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 EFZ must be strictly according to the prescribed engineering designs and approved drawings. • Erosion prevention and temporary sediment control measures must be implemented in areas prone to surface run-off and erosion. Temporary and permanent erosion control methods may include silt fences, interceptor ditches, seeding and sodding, riprap of exposed embankments, and mulching. 	CON		

Aspect	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
		<ul style="list-style-type: none"> Any sand stockpiles must have sufficient erosion protection measures to ensure sediment is not lost to overland flow. 			
C) Draining excavated areas during construction using fuel operated machinery	8) Indirect Impact: Damage to the existing infrastructure/structures within the surrounding areas.	The following measures must be carried out to mitigate against potential damage to existing infrastructure/structures within the surrounding areas: <ul style="list-style-type: none"> Access to the site must make use of approved access routes. Heavy vehicles and construction equipment must take care to not impact the accessibility of the area. Heavy vehicles must not operate within private property boundaries. The locations of existing infrastructure/structures within proximity of the construction footprint must be noted prior to construction. If damage occurs to any existing infrastructure/structures due to the operation of the construction vehicles, remediation must occur immediately. 			
	9) Direct Impact: Siltation of downslope areas within the EFZ.	The draining of the excavated areas during construction may be required for the formation of foundations. The following mitigation measures must be carried out: <ul style="list-style-type: none"> Where possible, all excavated areas must be drained into a temporary settling pond before releasing the water. 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 downslope erosion from the pumped pipe outflow Drip trays must be used under all fuel operated machinery at all times. 	CON		
	10) Direct Impact: Hydrocarbon spills leading to contamination of the EFZ		CON		
D) Clearing of vegetation for the construction of the Richards Bay Waterfront (LN3 Activity 12)	11) Direct Impact: Degradation, destruction and fragmentation of 198129 m ² of indigenous vegetation.	This impact cannot be completely mitigated as there will be vegetation loss; however, the following measures must be carried out to mitigate unnecessary and preventable vegetation clearing and limit the damage: <ul style="list-style-type: none"> Sensitive areas must be specifically demarcated to prevent the movement of workers into sensitive surrounding environments. All areas outside the working corridor must be demarcated as a 'no-go' zone with snow netting for the duration of the construction process. No site staff are permitted to enter these areas. 	CON		


Aspect	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
		<ul style="list-style-type: none"> • Areas that are denuded during construction must be re-vegetated with indigenous vegetation; this will also reduce the likelihood of encroachment by Invasive Alien Plant species. • No staff may bring or plant any plant species into any portion of the project area unless undertaken in line with the required/approved rehabilitation. No plant species whether indigenous or exotic must be brought into the project area, to prevent the spread of exotic or invasive species. • Areas regarded as sensitive must under no circumstances be fragmented or disturbed further or used as an area for the dumping of waste, laydown or infringement. • The Contractor must inform all site staff as to the use of supplied ablution facilities and under no circumstances shall indiscriminate excretion and urinating be allowed other than in supplied facilities. The recommended number of ablution facilities according to the Environmental Health and Safety Act should be implemented. Ablution facilities must be regularly serviced in order to prevent spillage and pose a health hazard. • The Contractor must supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility. • Where a registered disposal facility is not available close to the site, the Contractor must provide a method statement with regard to waste management. Under no circumstances may domestic waste be burned on site. The temporary storage of domestic waste shall be in covered waste skips. • Stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised and be surrounded by bunds. • If any indigenous faunal species are recorded during construction, activities must temporarily cease to allow fauna to move off. In the event that fauna does not voluntarily move away, an appropriate specialist must be consulted to identify the correct course of action. • Fauna species such as frogs and reptiles that have not moved away must be carefully and safely removed to a suitable location beyond the extent of the development footprint by a suitably qualified ECO, trained in the handling and relocation of animals. 			

Aspect	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
		<ul style="list-style-type: none"> The duration of the construction must be minimised to as short-term as possible, in order to reduce the period of disturbance to fauna. Any open trenches that are left open for more than two hours, must have at least one end that is sloped/tapered, in order to allow animals that fall in to escape. If this is not possible, then branches must be placed inside the trenches allowing small animals to climb out. Prior to and during vegetation clearance, any larger fauna species noted must be given the opportunity to move away from the construction machinery. No trapping, killing or poisoning of any wildlife is to be allowed on-site, including snakes, birds, lizards, frogs, insects or mammals. During the construction phase, noise and vibrations must be kept to a minimum to reduce the impact on the fauna. During the construction phase, no construction is to occur at night to minimise all possible disturbances to amphibian species possibly inhabiting the wetland. Staff must be educated about the sensitivity of faunal species and measures must be put in place to deal with any species that are encountered during the construction process. Appropriate measures must be implemented to prevent excessive noise and vibration. No construction is to occur at night to avoid disturbance to amphibians. Permits must be obtained from Ezemvelo KZN Wildlife and The Department of Environment, Forestry and Fisheries if any protected species are to be relocated and/or removed. 			
	<p>12) Direct Impact: Disruption/alteration of faunal species activities (breeding, migration, feeding).</p>	<p>The following measures must be carried out to mitigate the excessive and preventable impact on fauna:</p> <ul style="list-style-type: none"> Sensitive areas must be specifically demarcated to prevent the movement of workers into sensitive surrounding environments. All areas outside the working corridor must be demarcated as a 'no-go' zone with snow netting for the duration of the construction process. No site staff are permitted to enter these areas. 	CON		

Aspect	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
		<ul style="list-style-type: none"> • If any indigenous faunal species are recorded during construction, activities must temporarily cease to allow fauna to move off. In the event that fauna does not voluntarily move away, an appropriate specialist must be consulted to identify the correct course of action. • Fauna species such as frogs and reptiles that have not moved away must be carefully and safely removed to a suitable location beyond the extent of the development footprint by a suitably qualified ECO, trained in the handling and relocation of animals. • The duration of the construction must be minimised to as short-term as possible, in order to reduce the period of disturbance on fauna. • Any open trenches that are left open for more than two hours, must have at least one end that is sloped/tapered, in order to allow animals that fall in to escape. If this is not possible, then branches must be placed inside the trenches allowing small animals to climb out. • Prior to and during vegetation clearance, any larger fauna species noted must be given the opportunity to move away from the construction machinery. • No trapping, killing or poisoning of any wildlife is to be allowed on-site, including snakes, birds, lizards, frogs, insects or mammals. • During the construction phase, noise and vibrations must be kept to a minimum to reduce the impact on the fauna. • During the construction phase, no construction is to occur at night to minimise all possible disturbances to amphibian species possibly inhabiting the wetland. • Staff must be educated about the sensitivity of faunal species and measures must be put in place to deal with any species that are encountered during the construction process. • Appropriate measures must be implemented to prevent excessive noise and vibration. No construction is to occur at night to avoid disturbance to amphibians. 			
	<p>13) Direct Impact: Removal of alien invasive</p>	<ul style="list-style-type: none"> • This is a positive impact. 			

Aspect	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
	vegetation found along the pipeline route.				
	14) Indirect Impact: Encroachment of alien vegetation into cleared areas.	There is currently a significant amount of alien vegetation located on the site and within the surrounding area. <ul style="list-style-type: none"> • An extensive Invasive Alien Plant Programme must be developed and implemented. • Areas that have been cleared of invasive vegetation must be re-vegetated with indigenous pioneer species local to the area. This will aid in impeding the growth of IAPs. These areas must be monitored to ensure suitable vegetation growth. 	CON		
E) Construction activity in areas with no vegetated cover.	15) Direct Impact: Erosion on exposed banks and areas resulting in scouring, blocked stormwater systems and the siltation of the EFZ.	This impact is partially unavoidable as the construction activity will need to take place over cleared exposed areas. The following mitigation measures must, however, be applied: <ul style="list-style-type: none"> • Exposed banks that are susceptible to erosion must not be left exposed for more than 2 months at any time. • Erosion/ stormwater protection measures must be implemented above and below the slope in the form of sandbag berms, pack rock berms or even vegetation berms to slow runoff down the slope. • Any accumulated siltation that enters a watercourse must be removed by spade and shovel (by hand). • Exposed cut and fill slopes near the riparian areas must be top soiled, hydro seeded or have grass sods planted within 4 weeks of being cut. 	CON		
F) Mismanagement and poor handling of hazardous chemicals on-site	16) Direct Impact: Spilling of hazardous chemicals into the receiving environment and penetrating into sensitive habitats	The following measures must be carried out to mitigate the contamination of the environment with hazardous chemicals: <ul style="list-style-type: none"> • Construction activities and vehicles could cause spillages of lubricants, fuels and waste material potentially negatively affecting the functioning of the ecosystem. All vehicles and equipment must be routinely maintained, and all re-fuelling and servicing of equipment is to take place in low-sensitivity demarcated areas. • The contractor must have action plans on-site and training for sub-contractors and employees in the event of spills, leaks and hazardous chemical spills to the surrounding environment. A specialist Contractor must be used for the bioremediation of contaminated soil where the required remediation material and 	CON		

Aspect	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
		expertise is not available on site. A Hazardous Chemical Spill Contingency Plan must be compiled.			
G) Sourcing material from unlicensed borrow pits and sand mines in an illegal and unplanned manner	17) Indirect Impact: Increase danger to the surrounding community and detrimental to the local environment.	Bedding material is often sourced from local quarries or sand mines. The following criteria must be adhered to: <ul style="list-style-type: none"> Any local quarry or sand mine used must be a permitted source through DMR. The contractor excavating the material must do so within the parameters of the mining permit, adhering to the EMP conditions for that particular site. 	CON		
H) The construction period of Richards Bay Waterfront.	18) Indirect impact: This is a positive impact for the community through the potential creation of local employment.	<ul style="list-style-type: none"> This is a positive impact. 			
OPERATION IMPACTS					
I) Operation of the Richards Bay Waterfront (LN3 Activity 6)	19) Direct impact: Shoreline retreat along developed portions of the coast resulting in sedimentation and material deposition into the EFZ.	The following measures must be carried out to mitigate long term erosion: <ul style="list-style-type: none"> A comprehensive monitoring programme must be established. The monitoring plan must focus on disturbances of sediments, contamination of the estuary, and monitoring of sensitive ecological responders. Indicator species must be identified and monitored to assess the levels of disturbances to drivers within the estuary. The sand sharing line must be adhered to whereby no structures must be positioned eastwards of the delineated sand sharing system. 	APP		

Aspect	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
		 <ul style="list-style-type: none"> • The continued implementation of erosion defence systems must be avoided, where possible and where the opportunity is available, some erosion prevention measures should be removed. • The active planting of mangroves, in particular <i>A marina</i>, must be considered to restrain shoreline erosion. • All development must etake place outside of the 1:100 year flood line. 			
	<p>20) Indirect impact: Poor waste management leading to contamination of the EFZ.</p>	<p>The following waste management measures must be carried out:</p> <ul style="list-style-type: none"> • Adequate waste disposal facilities must be made available to reduce the accumulation of solid waste (litter) within the project area. • All waste produced on-site must be either disposed of through the existing municipal solid waste collection system or removed off-site for disposal by a third-party licenced waste contractor. 	APP		

Aspect	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
		<ul style="list-style-type: none"> Under no circumstance is any form of waste allow to be stored on-site for periods in excess of 1 month, nor is the burning or burial of waste permitted. 			
	<p>21) Indirect impact: Lack of maintenance of sewer infrastructure leading to the contamination of the EFZ with raw sewage</p>	<p>The following measures must be carried out to prevent any sewage contamination:</p> <ul style="list-style-type: none"> During the operation of the development, the pump stations and sewerage pipeline infrastructure must be regularly maintained, with preventative maintenance measures put into place. The development must be in constant communication with the WWTW, ensuring that there is sufficient capacity to handle the sewerage waste produced during operation. 	APP		
	<p>22) Direct impact: Increased number of people on-site resulting in increased water resource usage.</p>	<p>With densification comes the requirement for additional water supply. Water will be provided to the development through a piped reticulation system. As such, the increase in population will promote wastage of water.</p> <ul style="list-style-type: none"> All sites must have restrictor valves, reducing the maximum pressure permitted to be drawn from the tap Pipelines must be closely monitored, aiding in the detection of leaks and the unnecessary wastage of water. 	APP		
<p>J) Permanent increase hardened surfaces in</p>	<p>23) Direct Impact: Increased stormwater runoff.</p>	<p>Should the constructed mitigations not provide sufficient stormwater management, the following mitigation will be required on the site to further decrease sedimentation and improving water quality:</p> <ul style="list-style-type: none"> A comprehensive operational stormwater management plan to attenuate and dissipate energy and flows during high rainfall must be developed for every site. Artificial wetlands and/or similar measures such as sand, oil and grease traps to improve runoff water quality from built-up areas must be included in the stormwater management plan for each site. Runoff from the hardened areas is to be slowed via attenuation features before being discharged into the wetlands and watercourses. The velocity of the discharged water must not be more than that of the receiving system. 	APP		

Aspect	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
		<ul style="list-style-type: none"> The outflow from the attenuation features must be controlled using reduced diameter throttle pipes and/ or reno mattresses. These must be monitored and adjusted accordingly. Install appropriate erosion barriers and other sediment control structures during the operation phase. Identify any steeper areas where erosion is more likely to occur and ensure adequate protection of these slopes. Regularly check and clean material from behind constructed erosion barriers. Sediment/soil will not be permitted to enter the stormwater system. 			
	<p>24) Direct Impact: Localised increase in temperatures from tarred and concrete surfaces.</p>	<p>This is unavoidable within a development of this size. However, the planting of more vegetation, specifically large trees to provide shade, will greatly assist at reducing the overall increase in temperature.</p>			
<p>K) Operation of the stormwater, water and sewage pipelines</p>	<p>25) Direct Impact: Incomplete trenching and rehabilitation of the site resulting in long-term erosion and damage to the EFZ.</p>	<p>The following measures must be carried out to mitigate long term erosion:</p> <ul style="list-style-type: none"> Trench rehabilitation must be effectively carried out before contractors leave the site. The soil in the trenches must be compacted effectively to the same level or slightly higher than the surrounding land to prevent settling which could create depressions for water to travel along, creating erosion funnels and exposing the pipeline. Indigenous vegetation must be planted after the soil has been compacted. The vegetation must have taken successfully before contractors leave the site. All infrastructure must be inspected on a regular basis (at least twice a year). Should it be noted that there are signs of erosion, immediate action must be taken to prevent any further loss of material. 	<p>APP</p>		
	<p>26) Direct Impact: Damage to pipelines resulting in localised flooding, erosion and contamination in the EFZ.</p>	<p>Should a break in the pipeline occur the following must be implemented:</p> <ul style="list-style-type: none"> The water or sewerage flow must be stopped immediately to prevent any further damage to the watercourse. The pipeline must be repaired immediately to restore function. 	<p>APP</p>		

Aspect	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
		<ul style="list-style-type: none"> If damage to the EFZ was sustained (such as erosion), the area is required to be rehabilitated back to its original condition prior to the break in the pipe. This applies to any contamination that may occur as a result to the spill (i.e., sewerage). In the case of a sewerage spill, the condition of the EFZ must be assessed, and where necessary, cleaned of all waste and rehabilitated. <p>Specific mitigations required on the sewage pipeline:</p> <ul style="list-style-type: none"> The effectiveness of all sewage infrastructures must be monitored and maintained to ensure they are functioning correctly. All sewage infrastructure must be properly managed, maintained and operated throughout the life of the project. Periodic inspections of the sewage infrastructure should be implemented to identify any system failure. Any leaks and failures of the sewage infrastructure must be fixed immediately and affected areas rehabilitated as needed. 			
	<p>27) Direct Impact: Promotion of economic investment in the area</p>	<ul style="list-style-type: none"> This is a positive impact. 			
	<p>28) Indirect Impact: Increased hydrocarbons entering the EFZ as a result of runoff from internal roads</p>	<p>This is an unavoidable impact. The maintenance of the vehicles utilising the road is not in the control of the applicant. However, the surrounding EFZ should be inspected for contamination regularly. Where contamination has occurred, immediate remediation and rehabilitation of the area is required.</p>	APP		
<p>L) Public usage of the road network</p>	<p>29) Direct Impact: Increased number of vehicles impacting the surrounding road network (traffic jams in peak hours)</p>	<p>The densification of the project area will lead to an increase in the number of vehicles utilising the roads. It is therefore crucial that the surrounding road network be able to handle this traffic flow. Mitigation measures included in the TIA are as follows:</p> <ul style="list-style-type: none"> That the following intersections be upgraded as soon as possible: <ul style="list-style-type: none"> John Ross / Bayview Blv; John Ross / Hibberd Drive Intersection. 	APP		

Aspect	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
		<ul style="list-style-type: none"> • A traffic impact statement must be submitted to the municipality (as the precinct develops) with the submission of each Site Development Plan. • That the following intersections be upgraded as the developments unfolds: <ul style="list-style-type: none"> ○ Commodore Close / Bridgetown Rd; ○ Bayview Blv / Bridgetown Rd; ○ Hibberd / Davidson Lane; ○ Anglers / Krewelkring; ○ Bayview Blv / Davidson Lane • Public transport infrastructure must be provided as follows: <ul style="list-style-type: none"> ○ Walking distances to the stops should preferably be within 400 m but not ore than 800 m ○ Public transport must be spaced between 400 and 500 m apart on Class 4 roads; ○ Near as possible to intersections and on the downstream side of the intersection; ○ Public transport stops must be served by an adequate network of sidewalks and walkways. • Event management must be implemented during peak holiday periods. • The existing gravel road along the lagoon must be upgraded and used as a route to/from the waterfront area; 			
M) Lighting associated with the operation of the various facilities within the Richards Bay Waterfront	30) Direct Impact: Increase in light pollution in the local area.	Light pollution must be minimised. Lighting on site is to be sufficient for safety and security purposes. All lighting must either be faced inwards towards the development site or downwards towards the ground on site in order to make the lighting less intrusive and to not interfere with road traffic.	APP		
	31) Direct Impact: Impact on fauna.	Outside artificial lighting (i.e. spot/ flood lights) should be designed to minimize impacts on fauna. All outside lighting should be directed away from natural areas. Fluorescent and mercury vapour lighting should be avoided, and sodium vapour (yellow) lights should be used wherever possible.	APP		
	32) Direct Impact: Improvement in security.	<ul style="list-style-type: none"> • This is a positive impact. 			

Aspect	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
	33) Direct Impact: Increase in noise levels from vehicles frequenting the site, staff, customers, music and radio broadcasts.	Noise levels shall be kept within acceptable limits, and residents, visitors and staff must abide by National Noise Laws and local by-laws regarding noise. Equipment such as mechanical equipment, extraction fans, refrigerators that are fitted with noise reduction facilities (e.g., side flaps, silencers etc) must be used as per operating instructions and maintained properly. Noise levels should comply with the SANS Code of Practice 100103 – 0994 (recommended noise levels).	APP		
N) Long term maintenance of the Richards Bay Waterfront	34) Direct impact: IAP encroachment into disturbed areas arising from construction activity	The following measures must be carried out to ensure there is no IAP encroachment: <ul style="list-style-type: none"> An extensive Invasive Alien Plant Programme must be developed and implemented post-construction and must form part of the annual independent audit. 	APP		
SECTION 3: CONSTRUCTION MITIGATION MEASURES					

3.1. 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 construction camp	<ul style="list-style-type: none"> The construction camps must be marked out with the approval of the ECO and be located on land that is already transformed. 	CON			
	<ul style="list-style-type: none"> The site camps must be located on a flat transformed portion of land. Do not set up the construction camps within 32m of any watercourse or within an area that will be flooded should water levels rise. Do not set up construction camps within 32m of any other watercourse. 	CON			
	<ul style="list-style-type: none"> The site camps must be demarcated and fenced off to prevent illegal entry. 	CON			

	<ul style="list-style-type: none"> • The following areas must be demarcated and marked within the construction camps: <ul style="list-style-type: none"> ○ 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	<ul style="list-style-type: none"> • 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 undercover. Liquid waste must be situated within a bunded area. <ul style="list-style-type: none"> ○ Liquid waste and accumulated waste must be removed from the site monthly by a recognised Waste Contractor. 	CON		
	<ul style="list-style-type: none"> • A materials storage area must be identified and designated within the construction camps, which must be located more than 15m from any watercourse. Materials, specifically liquid and potentially environmentally hazardous materials must be stored within a bunded area (110% capacity of the largest container) and on a hard surface. The storage area must be undercover. 	CON		
	<ul style="list-style-type: none"> • Areas for fuel and hazardous chemical / flammable goods must be identified and 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		
	<ul style="list-style-type: none"> • Bulk fuel storage: No bulk fuel storage to occur on any of the sites. 	CON		
	<ul style="list-style-type: none"> • 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 the rivers. All stockpiling areas must be approved by ECO and must be located more than 15m from the edge of any watercourse. 	CON		

	<ul style="list-style-type: none"> • Parking: The contractor must designate parking areas on the sites and ensure that only these parking areas are used. • Vehicles must not park within 15m of any watercourse. 	CON		
	<ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> ○ 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 15m of any watercourse, riparian zone or wet area. ○ Drip trays must be used. ○ Any other planned or required maintenance must be done off-site at a suitable location. ○ Vehicle washing must also be conducted off-site at a designated vehicle wash bay, the wash bay must be lined with an impermeable material and must drain to a sump to ensure hydrocarbons, and other contaminants are separated before remaining runoff being discharged into the municipal sewer. ○ No cement vehicles may be washed on site. 	CON		
<p>Handling of liquids on site</p>	<ul style="list-style-type: none"> • 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 15m of any watercourse. 	CON		
	<ul style="list-style-type: none"> • 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 15m of any watercourse. 	CON		
	<ul style="list-style-type: none"> • 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 15m of any watercourse. 	CON		
	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> 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 per the MSDS. 	CON		
Storage of hazardous materials	<ul style="list-style-type: none"> Hazardous materials and liquids to be stored in the assigned storage area as per Section 3.0 of this EMPr. 	CON		

3.2. Administration & Records

Activity / Document	Required Action	Person	In place (Yes / No)	Comments
Site-Specific EMPr	<ul style="list-style-type: none"> 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		
	<ul style="list-style-type: none"> All contractors, the engineers and the ECO must have a copy of the EMPr before coming on to the site. 	ECO/ ENG		
Records	<ul style="list-style-type: none"> Keep records and proofs of all agreements, meetings etc. to demonstrate compliance with this EMPr. 	CON		
Proof of raw material sourcing and resource use	<ul style="list-style-type: none"> 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. <u>In other words, documented proof that materials have been sustainably sourced must be maintained on-site for review by EDTEA.</u> <ul style="list-style-type: none"> E.g., sand may only be obtained from approved sand winning operations, which is licensed by the Department of Mineral Resources (DMR) and has an approved EMPr for operation. Where materials are borrowed (mined), proof must be provided of authorisation to utilise these materials from the landowner/mineral rights owner and the Department of Minerals and Energy. 	CON/ EO		
Water abstraction for dust suppression	<ul style="list-style-type: none"> 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: 	CON/ EO		

	<ul style="list-style-type: none"> ○ If water is to be extracted it must be from an approved source, and permission from the landowner 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: <ul style="list-style-type: none"> ▪ The driver must record each truckload 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. 			
<p>Maintenance of the extraction point</p>	<ul style="list-style-type: none"> ● One point of entry must be established and approved by the ECO. Multiple entry points and pathways must 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 the creation of additional tracks. ● The abstraction area must not be located on steep slopes where the point may become eroded. ● Vehicles approaching the extraction point must remain 15m 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 sandbags or hessian sheeting must be put in place to allow the re-establishment of vegetation and stabilisation of the area. 	<p>CON/ EO</p>		

	<ul style="list-style-type: none"> Once an abstraction point is no longer being used, the area must be rehabilitated to its former state. 			
Proof of training	<ul style="list-style-type: none"> Keep training attendance registers on file at all times. 	EO		
Transnet Pipeline	<ul style="list-style-type: none"> Prior to commencement of the work a representative of Transnet Pipelines must be present to indicate the position of the pipeline. 	EO		
Incident records & Photographs	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Appoint an ECO (Environmental Control Officer) before commencement of construction to monitor the entire construction phase. 	ENG		
	<ul style="list-style-type: none"> Keep proof of appointment and contact details as well as dates of audits. 	APP		
Emergency response plan	<ul style="list-style-type: none"> An emergency response plan must remain on-site as must a copy of the EMPr and the Environmental Authorization. 	ECO		
Audits	<ul style="list-style-type: none"> A record of audits conducted on the site as well as findings must be kept on site. 	CON/ EO		
Permits & Approvals	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Material Safety Data Sheets (MSDSs) are to be kept on-site for all hazardous materials. 	CON		

3.3. Training & Awareness				
Activity	Required Action / remediation to control environmental impact	Person	In place (Yes / No)	Comments
Who should be trained & Frequency of training	<ul style="list-style-type: none"> All construction staff must have basic environmental awareness training, which can be conducted at the same time as the required health & safety training. 	EO		
	<ul style="list-style-type: none"> 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		
	<ul style="list-style-type: none"> Staff must sign a 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	<ul style="list-style-type: none"> Training must include <ol style="list-style-type: none"> The definition of environment (people + air + soil + water +business); Reasons for conserving and protecting the environment; 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 & groundwater; litter; What to do to prevent the above impacting the environment i.e. assign impermeable mixing areas, no vehicle washing on-site, use of waste receptacles and separation of waste to allow for recycling, how to respond in an emergency and deal with a spill; Consideration of neighbours. Do not play music or create any other disturbance to neighbours. Use only the chemical toilets provided. No dumping to occur in sensitive areas on site. Use waste bins provided. Use drip trays provided. Do not build fires for any purpose on the site. 	EO		

	<p>12. Behave in a socially acceptable manner and do not use drugs or alcohol on site.</p> <p>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.</p>			
Neighbours & Working hours	<ul style="list-style-type: none"> 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 the placement of signboards. 	CON		
	<ul style="list-style-type: none"> Limit hours of operation to weekdays 7-5pm and Saturday mornings 7 - 12 pm. Neighbours to be notified before construction on weekends takes place. 	CON		
	<ul style="list-style-type: none"> Advise the adjoining neighbours of the work and hours of work at least one week before commencement. This can also be indicated on the signboards. 	CON		
	<ul style="list-style-type: none"> Neighbours to be advised before periods where work will be done outside normal working hours. 	CON		

3.4. 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	<ul style="list-style-type: none"> The surrounding stakeholders must be made aware of the commencement of construction 30 days before construction. Alternate temporary access routes must be determined before the commencement of the construction. 	CON		

<p>Topsoil</p>	<ul style="list-style-type: none"> • Topsoil removed during the excavations must be kept to one side (stored more than 15m from any watercourse). • This must then be re-used for rehabilitation purposes. The soil must be replaced in the same area that it was excavated from. Much of this topsoil, especially the top 300mm, 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. 	<p>CON/ EO</p>		
<p>Vegetation clearing and planting</p>	<ul style="list-style-type: none"> • 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. 	<p>CON/ EO</p>		
<p>Alien vegetation control</p>	<ul style="list-style-type: none"> • On-going control of alien vegetation within the construction area must be maintained. 	<p>CON/ EO</p>		
	<ul style="list-style-type: none"> • An alien eradication program must be in place to control the spread of alien invasive species on site. 	<p>CON/ EO</p>		
<p>Paleontological Chance Fossil Find Protocol</p>	<ul style="list-style-type: none"> • In terms of a Chance Fossil Find Protocol, the following should be adhered to: <ul style="list-style-type: none"> - When construction activities begin, any rocks disturbed during this process must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (trace fossils, plants, insects, bone, and coal) should be put aside in a suitably protected place. - Photographs of possible fossils should be sent to a palaeontologist for preliminary assessment. - If there is any possible fossil material found by the environmental officer/miners then the qualified palaeontologist must be sub-contracted in order for them to visit the site to inspect the selected material and check the dumps where feasible. - Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site, permit must be obtained from the 	<p>CON/ EO</p>		

	Institute. Annual reports must be submitted to the Institute as required by the relevant permits.			
Heritage	<ul style="list-style-type: none"> The KwaZulu Natal Amafa and Research Institute should be contacted if any heritage objects are identified during earth-moving activities and all development should cease until further notice. No structures older than sixty years or parts thereof are allowed to be demolished altered or extended without a permit from the KwaZulu Natal and Amafa Research Institute. Under no circumstances may any heritage material be destroyed or removed from the site unless under direction of the KwaZulu Natal and Amafa Research Institute and a heritage specialist. Should any remains be found on site that is potentially human remains, the South African Police Service (SAPS) should also be contacted. No SAPS official may disturb or exhume such remains, without the necessary permission from the KwaZulu Natal and Amafa Research Institute. No activities are allowed within 50m of a site, which contains rock art. Sources of all natural materials (including topsoil, sands, natural gravels, crushed stone, asphalt, etc.) must be obtained in a sustainable manner and in compliance with the heritage legislation. 	CON		

3.5. Soil, Stormwater Runoff; Erosion				
Activity	Required Action / remediation to control environmental impact	Person	In place (Yes / No)	Comments
Stormwater system	<ul style="list-style-type: none"> Temporary stormwater protection measures must be established before construction activities commence. 	CON		

	<ul style="list-style-type: none"> No contaminated runoff or greywater is allowed to be discharged from the Site Camps into any watercourse or surrounding environment. 	CON		
	<ul style="list-style-type: none"> Stormwater must not be allowed to flow into surrounding properties and must enter existing stormwater channels. 	CON		
Stormwater Quality	<ul style="list-style-type: none"> Only clean stormwater may be diverted to a watercourse, and associated wetlands and then precautions must be in place to prevent erosion of the riverbanks. These precautions can include gabion baskets, berms or diversion ditches, sandbags 	CON		
	<ul style="list-style-type: none"> Washings from any vessels or any containers must not enter the watercourse. These washings are to be contained and removed as waste. 	CON		
Incidents	<ul style="list-style-type: none"> The entry of any substance (i.e. any material or substance that is not clean stormwater) into the stormwater or a water body is considered an incident and must be reported to the ECO <u>immediately</u> for the purposes of maintaining the site's incident records. 	CON/ EO		
Stormwater flow	<ul style="list-style-type: none"> The drainage system must be regularly checked to ensure unobstructed water flow. 	CON		
Erosion Control	<ul style="list-style-type: none"> 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		
	<ul style="list-style-type: none"> Identify any steeper areas where erosion is more likely to occur. These areas must be protected from erosion. This can be achieved through the planting of vegetation, placement of berms or use of hessian material. 	CON/ EO		
	<ul style="list-style-type: none"> Regularly check and clean material from behind erosion barriers. 	CON/ EO		
	<ul style="list-style-type: none"> 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		

3.6. Housekeeping, Waste Storage Handling and Disposal				
Activity	Required Action / remediation to control environmental impact	Person	In place (Yes / No)	Comments
General Waste Storage	<ul style="list-style-type: none"> The waste area to be designated and demarcated within the construction camp (as per section 3). 	CON		
	<ul style="list-style-type: none"> 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 be documented, and these records must be maintained on-site for review by EDTEA. 	CON		
Hazardous waste	<ul style="list-style-type: none"> Hazardous materials that require disposal (cement, paints, solvents, old fuel/oil etc.) must be disposed of at a registered hazardous landfill site. 	CON		
	<ul style="list-style-type: none"> 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 be documented, and these records must be maintained on-site for review by EDTEA. 	CON		
Waste from Chemical toilets	<ul style="list-style-type: none"> The contractor must develop a method statement as to the management of chemical toilets on site. 	CON		
	<ul style="list-style-type: none"> Install chemical toilets and ensure disposal of waste at a licenced disposal facility. Proof of disposal must be kept on-site at all times. 	CON		
	<ul style="list-style-type: none"> Waste from the toilets must be collected weekly by a registered and reputable company. 	CON		
	<ul style="list-style-type: none"> Safe disposal certificates for toilet waste must be obtained and kept on-site as assurance that the waste was properly disposed of. 	CON		
	<ul style="list-style-type: none"> Toilets must not be situated on slopes or within 40m of any watercourse and must be secured to prevent them from tipping over. 	CON		
	<ul style="list-style-type: none"> Staff must use facilities provided and are not permitted to use any other areas on-site as toilet facilities. 	CON		
	<ul style="list-style-type: none"> Chemical toilets must be checked daily and cleaned. 	CON		

Waste storage and handling	<ul style="list-style-type: none"> No waste may be buried or burned on-site or dumped on surrounding properties and farmland. All waste must be disposed of at a licenced waste disposal facility. Proof of disposal must be kept on-site at all times. 	CON		
	<ul style="list-style-type: none"> All skips must be covered to contain odours and prevent waste from blowing around the site. 	CON		
	<ul style="list-style-type: none"> A register of all waste generated and disposed of must be maintained. 	CON/EO		
	<ul style="list-style-type: none"> 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 the damage and advise on rehabilitation measures if required. 	CON		
	<ul style="list-style-type: none"> Do not place waste containers, skip bins or building materials on steep slopes or within 15m of the stream. 	CON/EO		
	<ul style="list-style-type: none"> Waste accumulated on-site must be removed weekly. The waste must be moved to a licenced waste disposal facility. 	CON		
	<ul style="list-style-type: none"> Provide litter bins throughout the site for use by all staff on site. 	CON		
Waste separation	<ul style="list-style-type: none"> Hazardous: Hazardous waste must be stored separately from general waste. <ul style="list-style-type: none"> 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		
	<ul style="list-style-type: none"> Oils must be within a banded storage area and treated as flammable waste. <ul style="list-style-type: none"> 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		

	<ul style="list-style-type: none"> • Concrete waste: <ul style="list-style-type: none"> ○ Return excess concrete with the delivery truck to the 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		
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3.7. Noise				
Activity	Required Action / remediation to control environmental impact	Person	In place (Yes / No)	Comments
Noise Generation and suppression	<ul style="list-style-type: none"> • All construction vehicles must be fitted with standard silencers and be well maintained. 	CON		
	<ul style="list-style-type: none"> • Workers must be trained regarding noise on-site, and construction hours must be kept to working hours (07h00 to 17h00). 	CON		

3.8. Dust & Emissions				
Activity	Required Action / remediation to control environmental impact	Person	In place (Yes / No)	Comments
Dust from stockpiles	<ul style="list-style-type: none"> • Cover any stockpiled fine material that may release dust with plastic. 	CON		
Dust from surfaces	<ul style="list-style-type: none"> • Damp down surfaces and stockpiles as required to reduce windblown dust. 	CON		
	<ul style="list-style-type: none"> • A water cart may be used which must remain on designated roadways if required. 	CON		
	<ul style="list-style-type: none"> • If dust from the site is likely to create problems for nearby residents, these areas must be shielded with shade cloth. 	CON		

3.9. 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	<ul style="list-style-type: none"> Haulage roads must be demarcated at the site set up. 	CON		
	<ul style="list-style-type: none"> Turning areas must be located within the construction footprint and must be designated. 	CON/ EO		
	<ul style="list-style-type: none"> Temporary access roads must not be located within adjoining properties. 	CON/ EO		
	<ul style="list-style-type: none"> No ad hoc haulage roads or turning areas may be created. 	CON/ EO		
	<ul style="list-style-type: none"> Limit vehicle entry point to the designated access point and ensure no other point of entry is used. 	CON/ EO		
	<ul style="list-style-type: none"> All vehicles to remain in the parking area designated within the construction site. 	CON/ EO		
Vehicle Servicing and repairs	<ul style="list-style-type: none"> 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		
	<ul style="list-style-type: none"> 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 workshop areas within the allowed construction camps. These areas to be hard-surfaced and bunded. 	CON		
	<ul style="list-style-type: none"> Drip trays are to be used by all leaking vehicles and equipment. 	CON/ EO		
	<ul style="list-style-type: none"> All vehicles to be equipped with drip trays. 	CON/ EO		

	<ul style="list-style-type: none"> All small machinery used on site must be situated on a drip tray (i.e. pumps, generators, compressors etc.). 	CON/ EO		
	<ul style="list-style-type: none"> All vehicles to be regularly maintained and maintenance records must be made available on request. 	CON/ EO		
	<ul style="list-style-type: none"> No leaking vehicles to be allowed on site. 	CON/ EO		
	<ul style="list-style-type: none"> Any vehicles that are leaking must not be allowed entry to the site. 	CON/ EO		
	<ul style="list-style-type: none"> No vehicles to be washed on-site - cement trucks are not permitted to wash out cement mixers on site. 	CON/ EO		
	<ul style="list-style-type: none"> 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		

3.10. Incidents, Spills and Emergency Response				
Activity	Required Action / remediation to control environmental impact	Person	In place (Yes / No)	Comments
Spill kits	<ul style="list-style-type: none"> Adequate spill kits and containers for spilt and contaminated material to be on standby on site. 	CON/EO		
	<ul style="list-style-type: none"> Keep marked booms and/or absorbent material on-site to contain spills if they occur. 	CON/ EO		
	<ul style="list-style-type: none"> All staff must be trained on how to react in the case of an emergency. 	CON-SHE		
	<ul style="list-style-type: none"> If a spill occurs, stop the source, contain it, clean up as per MSDSs and notify relevant authorities. 	CON/ EO		

	<ul style="list-style-type: none"> • Make staff aware of emergency phone numbers to use in the case of a large spill. 	CON/ EO		
Definition of incidents	<ul style="list-style-type: none"> • All incidents are to be recorded. 	CON/ EO		
	<ul style="list-style-type: none"> • Minor incidents: small spills less than 5 l that do not enter stormwater or the stream/river, minor non-compliance with EMP that does not cause major environmental impact, i.e. housekeeping issues etc. <ul style="list-style-type: none"> ○ Action: Supervisor and staff on-site to record and address and notify ECO. Take photos of the spill. Prevent spill from spreading and contain. Collect spilt material and contaminated soil and place in a sealed container for disposal. ECO to advise on remediation measures and to follow up on actions taken to address the incident. ○ Records: On-site incident register. 	CON/ EO		
	<ul style="list-style-type: none"> • Major incidents: Large spills or any spills that enter stormwater or the stream/river, fires, explosions. Please see the definition of a reportable incident provided below. <ul style="list-style-type: none"> ○ 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 the incident. ○ Records: On-site incident register and report to authorities. 	CON/ EO		
Spillage management	<ul style="list-style-type: none"> • In the event of a spill, the following steps must be taken: <ul style="list-style-type: none"> - Stop the source of the spill; - Contain the spill; - Report the spill to this Department and all other relevant authorities; - Remove the spilled product for treatment and/or authorised disposal; - Determine if there is any soil, groundwater or other environmental impact; - Where necessary, undertake remedial actions in consultation with this Department and the Department of Economic Development, Tourism and Environmental Affairs; and - Document the incident. 	CON/ EO		

3.11. Sewage and Grey Water Management				
Activity	Required Action / remediation to control environmental impact	Person	In place (Yes / No)	Comments
Sewage	<ul style="list-style-type: none"> 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		
	<ul style="list-style-type: none"> Waste must be managed as per section 3.5, namely removed by a 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		
Greywater/wash water	<ul style="list-style-type: none"> Greywater must not be permitted to enter the surrounding properties or stormwater. 	CON/ EO		
	<ul style="list-style-type: none"> Vehicles, especially cement trucks, must not be washed on site these must be washed at a wash bay facility off-site. 	CON/ EO		
	<ul style="list-style-type: none"> 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

4.1. Post Construction Activities				
Activity	Required Action / remediation to control environmental impact	Person	In place (Yes / No)	Comments
Post Construction Audit	<ul style="list-style-type: none"> Clearance from the ECO must be obtained to ensure the all of the requirements of the EMPr have been complied with. 	ECO		
Stormwater	<ul style="list-style-type: none"> The Contractor must check that the stormwater channels are free from building rubble, spoil materials, and waste materials. 	CON		
	<ul style="list-style-type: none"> Ensure that in the long term; stormwater is protected from ingress by potential pollutants. 	CON		
Waste & Spills	<ul style="list-style-type: none"> All spillages must be cleaned and contaminated soil must be removed and disposed of. 	CON/ EO		
	<ul style="list-style-type: none"> All remaining waste bins and/or skips must be removed and disposed of. Records of disposal must be retained. 	CON/ EO		
	<ul style="list-style-type: none"> All excess concrete must be removed from the site on completion of works and disposed of. Washing of the excess into the ground is not allowed. 	CON/ EO		
	<ul style="list-style-type: none"> All excess aggregate must also be removed. 	CON		
	<ul style="list-style-type: none"> Used oil must have been collected by a registered used oil contractor and documentation to this effect provided. 	CON		
	<ul style="list-style-type: none"> Surfaces are to be checked for waste products from activities such as concreting are cleared in a manner approved by the ECO. 	CON		
	<ul style="list-style-type: none"> No litter must be left on site. 	CON/EO		

Structures, materials and stockpiles	<ul style="list-style-type: none"> Any fences, barriers, or demarcations utilised for the construction phase must be removed and disposed of. 	CON		
	<ul style="list-style-type: none"> All structures and imported materials within the construction camp must be removed. 	CON		
	<ul style="list-style-type: none"> The remaining building materials must be removed from the site. 	CON		
Damage	<ul style="list-style-type: none"> Any damage incurred on the neighbouring homesteads by the contractor must be repaired by the contractor. 	CON		
	<ul style="list-style-type: none"> Any damage to existing infrastructure must be repaired or replaced on completion of the upgrade. 	CON		
Close Out	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> All vegetation planting must be completed and any areas that have been disturbed or cleared must have been rehabilitated and revegetated. 	ECO		
	<ul style="list-style-type: none"> Re-vegetation of cleared land must utilise only 100% locally indigenous plant material to ensure no erosion occurs once the site is vacated. 	CON/EO		
	<ul style="list-style-type: none"> Ensure that no sensitive habitats have been damaged during the construction phase. 	ECO		
	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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		

4.2. Rehabilitation				
Activity	Required Action / remediation to control environmental impact	Person	In place (Yes / No)	Comments
Rehabilitation	<ul style="list-style-type: none"> 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 <i>Urochloa panicoides</i> (Garden Signal Grass), <i>Pogonarthria squarrosa</i> (Herringbone grass), <i>Eragrotis curvula</i> (Weeping Love Grass) and <i>Chloris gayana</i> (Rhodes Grass). 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. Cleared areas must not be left exposed for periods longer than two weeks and must be revegetated in stages as each section is completed. 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	<ul style="list-style-type: none"> Topsoil removed during the excavations must be kept to one side (stored more than 15m from all 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 topsoil to be used when re-vegetating and rehabilitating areas cleared for construction/ excavation. 	CON/ EO		

Rehabilitation of eroded areas	<ul style="list-style-type: none"> Any erosion damage caused during construction must be repaired. The affected area must be reshaped, and the soil replaced. The eroded area must be re-vegetated or measures put in place to control further erosion. The contractor must install erosion barriers (gabion baskets, berms or diversion ditches, sandbags) and other sediment control structures (grates or grids, geofabric). 	CON/ EO		
Removal of alien invasive plants	<ul style="list-style-type: none"> 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 any watercourse	<ul style="list-style-type: none"> Where any watercourse has been damaged, the following measures are to be taken to ensure restoration of the habitat: <ul style="list-style-type: none"> ECO must assess the damaged area Any construction debris or contaminants within the watercourse must be removed Original soil structure must be restored Any impedance or diversion to water flow must be removed The area must be vegetated with suitable riparian or wetland species No loose soil or damaged banks can be left behind after construction. 	CON/ EO		

4.3. Operation				
Activity	Required Action / remediation to control environmental impact	Person	In place (Yes / No)	Comments
Inspections of roads, water pipelines and stormwater infrastructure	<ul style="list-style-type: none"> All roads, water pipelines and stormwater infrastructure must be monitored to ensure that any damage is repaired timeously to avoid any damage to the associated watercourses. This work must be undertaken by municipal appointed staff. Inspections of the infrastructure must take place on an annual basis through visual inspections. If any damage is evident, that 	APP		

	requires remediation the relevant person in the Municipality will be notified.									
	<ul style="list-style-type: none"> • Inspection of all the sewerage systems must be carried out regularly to ensure that the system is functioning properly. • The frequency of inspection must be determined principally from the nature and importance of the installations, the likely consequences of malfunction and the frequency of complaints received in the vicinity. • Priority must be given to those installations where the result of failure would be serious or the remedial works particularly expensive. The recommended frequency of inspections of sewers is shown below: <table border="1"> <thead> <tr> <th>Component</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>Zones of complaints</td> <td>1 month to 6 months depending on location</td> </tr> <tr> <td>Other smaller sewer lines</td> <td>1 to 5 years</td> </tr> </tbody> </table>	Component	Frequency	Zones of complaints	1 month to 6 months depending on location	Other smaller sewer lines	1 to 5 years	APP		
Component	Frequency									
Zones of complaints	1 month to 6 months depending on location									
Other smaller sewer lines	1 to 5 years									
Maintenance of the roads, culverts, pipes and pipe bridges	<ul style="list-style-type: none"> • The following mitigation measure must be implemented on-site during all maintenance work: <ul style="list-style-type: none"> ○ All maintenance vehicles and machinery must make use of existing access routes; ○ Laydown yards, camps, and storage areas must be more than 32m from any water resource; ○ All machinery and equipment must be inspected regularly for faults and possible leaks, these must be serviced off-site ○ The contractors used for the maintenance must have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly; ○ Uncontrolled access of vehicles through any watercourse must not be permitted; ○ Adequate sanitary facilities and ablutions must be provided for all personnel on site. Use of these facilities must be enforced; 	APP								

	<ul style="list-style-type: none"> ○ All removed soil and material must not be stockpiled more than 32m from any water resource. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds; ○ No dumping of construction material on-site may take place; ○ An on-site environmental file must be maintained. The following documents must remain on site: <ul style="list-style-type: none"> ○ Environmental Authorisation ○ EMPr ○ Audit reports ○ Waste register with safe disposal certificates ○ Proof of toolbox talks. ○ Any other documents requested by the ECO. ○ The waste hierarchy must be implemented on site, reduce, reuse and recycle. All waste generated on-site during construction must be adequately managed. Separation and recycling of different waste materials should be supported. Safe disposal certificates must be obtained and kept on file for review. ○ Toolbox talks must be conducted on a regular basis which must cover environmental topic dealing with but not limited to, waste management, conservation of water, protection of fauna and flora and good housekeeping. ○ An ECO (Environmental Control Officer) must be appointed before commencement of construction to monitor the entire construction phase. The ECO must undertake an audit every month during maintenance activities. ○ Keep proof of appointment and contact details as well as dates of audits. ○ All audit report must be sent to the compliance division of EDTEA for review. 			
<p>Sewage spillage protocol</p>	<p>If a large sewage spillage was to occur a spillage the following implementation plan must be utilised:</p> <ul style="list-style-type: none"> • The relevant authorities i.e. EDTEA and DWS must be contacted 			

	<ul style="list-style-type: none"> • Through consultation with the Departments, the relevant repairs must be undertaken. • A specialist spill response and clean-up company will be procured to remove all domestic waste build-up. • A groundwater and soil testing protocol must be implemented. • If required there must be the creation of performance wells close to the site of the spillage, in the up-gradient and down gradient areas to the site. Once the performance wells are in place, there will be a collection of up to two (2) groundwater samples. • There must be the collection of up to four (4) surface water samples from the watercourses upstream and downstream of the spillage. Please note this item will only be conducted if there is available surface water. • All results must be submitted to a SANAS-accredited laboratory for analysis. • The results from the analysis will thus be used to determine if any additional remediation measures are required. 			
Soil Erosion	<ul style="list-style-type: none"> • All 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	<ul style="list-style-type: none"> • 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.

Greywater

This is wash water that may contain non-hazardous soaps, i.e. bathwater, 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 greywater 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 approved sand winning operations, 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.

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

<p>Aim of this document</p>	<ul style="list-style-type: none"> To effectively manage the 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. <p>Activities covered in this procedure include:</p> <ul style="list-style-type: none"> Identification and definition of an incident and whether or not it needs to be reported to the authorities. Reporting to the relevant authorities if a reportable incident occurs Procedure to follow in the event of a spill or fire.
<p>Personnel Duties and Responsibilities</p>	<p>The contractor is responsible for:</p> <ul style="list-style-type: none"> 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.
<p>Training Requirements</p>	<ul style="list-style-type: none"> All personnel and workforce to undergo a site safety and environmental induction before starting work on site. All employees to be trained on how to respond to an environmental incident and whom to contact in order to ensure that the incident is addressed and recorded and if necessary reported.
<p>Definition of a “reportable incident”</p>	<ul style="list-style-type: none"> 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 the stormwater system must be reported. The relevant sections from the legislation are provided below:
<p>National Environmental Management Act</p>	<p><i>As defined by NEMA, section 30 “Control of emergency incidents”.</i></p> <p><i>(1) In this section—</i></p> <p><i>(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;</i></p> <p><i>(b) “responsible person” includes any person who—</i></p> <p><i>(i) is responsible for the incident;</i></p> <p><i>(ii) owns any hazardous substance involved in the incident; or</i></p> <p><i>(iii) was in control of any hazardous substance involved in the incident at the time of the incident;</i></p>

	<p>(c) “relevant authority” means—</p> <ul style="list-style-type: none"> (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.
<p>National Water Act</p>	<p>As defined by the National Water Act section 20 “Control of emergency incidents”</p> <p>(1) In this section “incident” includes any incident or accident in which a substance -</p> <ul style="list-style-type: none"> (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.
<p>Reporting to the authorities</p>	<p>If 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.</p> <p>The relevant sections from the legislation are included below:</p> <p>As taken from NEMA, section 30: Control of Emergency Incidents:</p> <p>(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—</p> <ul style="list-style-type: none"> (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 too— <ul style="list-style-type: none"> (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. <p>(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—</p> <ul style="list-style-type: none"> (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. <p>(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—</p> <ul style="list-style-type: none"> (a) the nature of the incident;

	<p>(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;</p> <p>(c) initial measures taken to minimise impacts;</p> <p>(d) causes of the incident, whether direct or indirect, including equipment, technology, system, or management failure; and</p> <p>(e) measures taken and to be taken to avoid a recurrence of such incident.</p> <p>(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:</p> <p>(a) the principles set out in section 2;</p> <p>(b) the severity of any impact on the environment as a result of the incident and the costs of the measures being considered;</p> <p>(c) any measures already taken or proposed by the person on whom measures are to be imposed, if applicable;</p> <p>(d) the desirability of the State fulfilling its role as custodian holding the environment in public trust for the people;</p> <p>(e) any other relevant factors.</p> <p>(7) A verbal directive must be confirmed in writing at the earliest opportunity, which must be within seven days.</p> <p>(8) Should—</p> <p>(a) the responsible person fails to comply, or inadequately comply with a directive under subsection (6);</p> <p>(b) there be uncertainty as to who the responsible person is; or</p> <p>(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—</p> <p>(i) contain and minimise the effects of the incident;</p> <p>(ii) undertake cleanup procedures; and</p> <p>(iii) remedy the effects of the incident.</p>
<p>National Water Act section 20: Control of emergency incidents</p>	<p>(2) In this section, "responsible person" includes any person who -</p> <p>(a) is responsible for the incident;</p> <p>(b) owns the substance involved in the incident, or</p> <p>(c) was in control of the substance involved in the incident at the time of the incident.</p> <p>(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 -</p> <p>(a) the Department;</p> <p>(b) the South African Police Service or the relevant fire department; or</p> <p>(c) the relevant catchment management agency.</p> <p>(4) A responsible person must -</p> <p>(a) take all reasonable measures to contain and minimise the effects of the incident;</p> <p>(b) undertake to clean-up procedures;</p>

	<p>(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.</p>
Spill response	
Responsible Person/s	<p>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.</p>
Procedure	<ol style="list-style-type: none"> 1. Identify the nature of the 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/groundwater or soil) 6. Ensure that cleanup measures are taken if any contamination has occurred 7. Record in emergency response record the: <ul style="list-style-type: none"> • Nature of incident • Cause of incident • Clean up measures • Mitigation measures are 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 DWS. 10. The ECO shall review all spill reports
Fire	
Responsible Person/s	<p>The fire is reported to the site foreman All employees must be made aware of the procedure in case of fire.</p>
Procedure	<ol style="list-style-type: none"> 1. Identify the 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 from entering any water body. 5. Ensure that clean-up measures are taken if any contamination has occurred 6. Record in emergency response record the: <ul style="list-style-type: none"> • Nature of incident • Cause of incident • Clean up measures • Mitigation measures are taken 7. Record in non-compliance register

	<ol style="list-style-type: none"> 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	<p>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 an explosion.</p>
Procedure	<ol style="list-style-type: none"> 1. Identify the source and nature of the 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 from entering any water body. 5. Ensure that clean-up measures are taken if any contamination has occurred 6. Record in emergency response record the: <ul style="list-style-type: none"> • Nature of incident • Cause of incident • Clean up measures • Mitigation measures are 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • It is rare that a contractor has employees or members 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 works 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 the construction area	<ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> ○ Mechanical Control <ul style="list-style-type: none"> ▪ Hand pulling ▪ Manual removal using hand tools ▪ Manual removal using mechanised tools ○ Chemical Control <ul style="list-style-type: none"> ▪ 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	<ul style="list-style-type: none"> • 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 during the use of herbicides: <ul style="list-style-type: none"> ○ Do not spray herbicides in windy conditions ○ Preferably spray in dry conditions and not before 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. ○ A buffer zone which must remain untreated must be retained around any watercourse. A minimum buffer of 10m must be retained. This will have to be managed by mechanical means. ○ Empty containers or unused herbicides must be disposed of correctly and may not be dumped on site.