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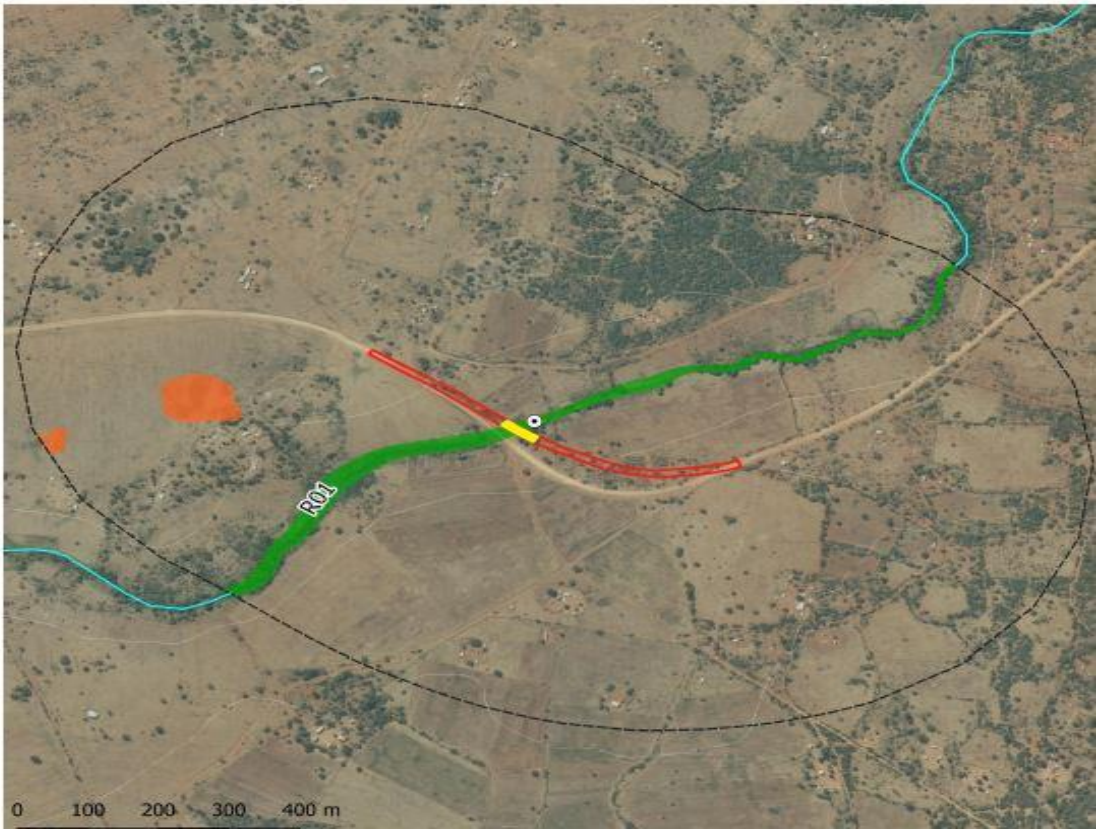
THE CONSTRUCTION OF THE BALAMHLANGA RIVER BRIDGE 3505 AT KM 41.4 ON DISTRICT ROAD D1834 (KM 41.810 - KM 42.000) WITHIN THE UMHLABUYALINGANA LOCAL MUNICIPALITY

Draft Environmental Management Programme

January 2022



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1. PROJECT DETAILS

1.1 Overview of the Proposed Balamhlanga River Bridge 3505 within The Umhlabuyalingana Local Municipality – KwaZulu-Natal

Afzelia Environmental Consultants (Pty) Ltd was appointed by MPAMOT Africa (Pty) Ltd. on behalf of the KwaZulu-Natal Department of Transport (KZN DoT) to undertake an Environmental Impact Assessment (EIA) in the form of a Basic Assessment (BA) process, as well as a Water Use License Application (WULA) for the proposed Balamhlanga River Bridge 3505 approximately 19km east of Jozini and located within the Umkhanyakude District Municipality, KwaZulu-Natal

It is proposed that the D1834 to be realigned such that the new bridge crossing can be positioned optimally. It has been recommended by the Engineer that the existing bridge be closed due to Health and Safety concerns. The proposed new bridge is approximately 20m downstream of the existing crossing. It is proposed to be 61.5m long and 13.1m wide bridge to improve road safety. The portion of the D1834 road is from KM40+800 to KM42+000. The proposed realignment is approximately1.2km in length with a width of approximately 9.5 and walkways are only at the approach and departure of bridge

1.2 Location

The site of the Proposed Balamhlanga River Bridge 3505, is located along the D1834 road within a rural area known as Mamfene (GPS co-ordinates: 27°22'1.47"S; 32°14'46.71"E), approximately 19km east of Jozini and located within the Umkhanyakude District Municipality, KwaZulu-Natal (KZN). The existing bridge crossing traverses a lowland reach of the Balamhlanga River. See **Figure 1** below.

1.3 Details of person(s) that compiled the EMPR

Name and details of the Environmental Practitioner:

Rivani Maharaj (BA Hon. Environmental Management): Rivani has eight years of consulting experience as an Environmental Assessment Practitioner. Her interest Environmental Compliance Officer Monitoring and auditing. Her experience inter alia:

- Undertaking of EIA covering the BA process as required by environmental legislation in terms of the NEMA (Act 107 of 1998).
- Undertaking of WULA in terms of the National Water Act (NWA) (Act No. 36 of 1998);
- Compilation of Environmental Management Programmes (EMPr) for some range of developments;
- Undertaking Public Participation Process (PPP) to facilitate EIAs and WULAs;

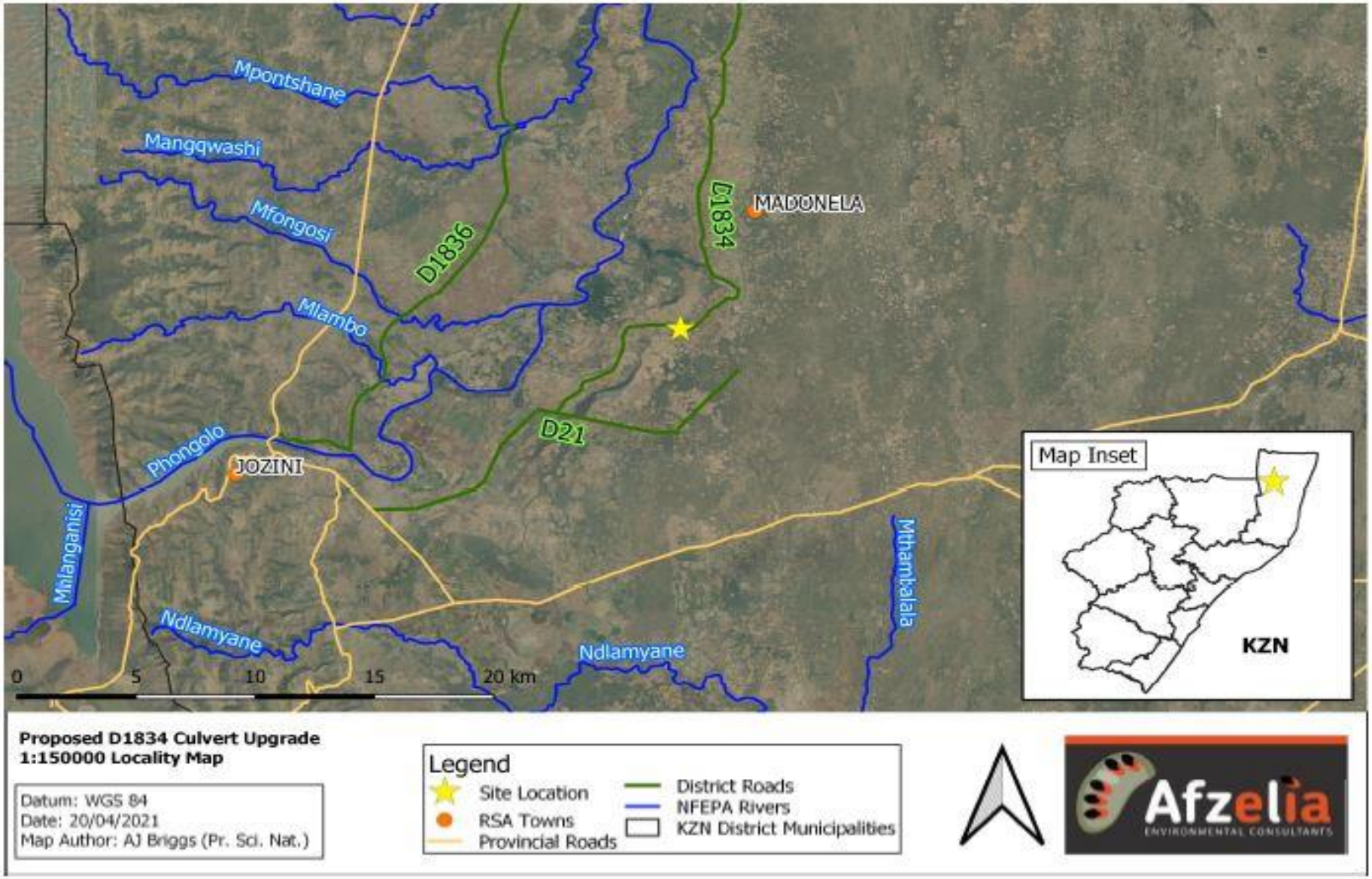

Figure 1: Locality Map

2. OUTCOMES AND OBJECTIVES

An EMPr is centred around sound environmental management practices with the intention to minimise and mitigate environmental impacts on site. The aim of this EMPr is to integrate environmental planning, design, construction, operation activities and rehabilitation for Proposed Balamhlanga River Bridge 3505 within the Umhlabuyalingana Local Municipality, within the uMkhanyakude District Municipality

The EMPr sets out the objectives and outcomes required for mitigation. The term "mitigation" in this content refers to reducing the severity of environmental impacts and enhancing the positive outcomes of the proposed project.

The EMPr includes consideration of the following:

- Minimising impacts by limiting aspects of an action;
- Rectifying impacts by rehabilitation or restoration of the affected environment;
- Compensating for impacts by providing substitute resources or environments;

Any environmental issues that are identified during or after construction must be addressed in consultation with the environmental consultant. As such this EMPr must be viewed as a dynamic document that may require updating or revision where necessary.

***Please note:** Whilst activities and earthworks associated with construction must be undertaken in accordance with all relevant SANS and COLTO standards, which deal with guidelines for civil engineering and general construction works, the conditions /requirements of this EMPr will take precedence over any other contractual /tender conditions. The contractor must make allowances to ensure that they are capacitated to comply with the EMPr requirements at all times.*

3. ENVIRONMENTAL MANAGEMENT PROGRAMME

3.1 Signing of the EMPr

The acknowledgement form attached in **Appendix 1** must be signed by the Proponent, any Project Managers/Engineers, the ECO, and all the Contractors. All the Contractors' employees, especially the machine and equipment operators, are to be made aware of the conditions and requirements as contained in the EMPr.

3.2 Key environmental legislation and policies that are applicable to a bridge construction

Environmental legislation applicable to the formulation of this EMPr includes but is not restricted to the following:

- The Constitution of the Republic of South Africa (Act 108 of 1996), including the Bill of Rights (Chapter 2, Section 24).
- National Environment Management Act (Act 107 of 1998).
- National Environmental Management: Biodiversity Act (Act 10 of 2004).
- National Environmental Management: Waste Act (Act 59 of 2008).
- National Water Act (Act 36 of 1998).
- National Forests Act (Act 84 of 1998).
- Conservation of Agricultural Resources Act (Act 43 of 1983).
- The National Heritage Resources Act (Act 25 of 1999 as amended).
- KwaZulu-Natal Heritage Act (Act 10 of 1997).
- National Monuments Act (Act 28 of 1969).
- Hazardous Substances Act (Act 15 of 1973).
- Occupational Health and safety Act (Act 85 of 1993).
- Integrated Environmental Management.
- KwaZulu-Natal Nature Conservation Ordinance (15 of 1974).
- Provincial and Local Government Ordinances and Bylaws.

Of importance are also all provincial and municipal by-laws and regulations that are not listed here. Statutes are amended periodically, and it is the Applicant's responsibility to identify legislation relevant to the proposed activity.

3.3 Duty of care and remediation & offences

The National Environmental Management Act (Act 107 of 1998) (NEMA), is South Africa's overarching environmental legislation: Section 28 of NEMA (Act 107 of 1998), in terms of Duty of Care and Remediation of Environmental Degradation states that: *" Every person who causes has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot be reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment"*

NEMA and its regulations entitle environmental authorities to administer a fine not exceeding R10 million- or 10-years imprisonment and/or a fine and imprisonment for a person guilty of an unlawful activity. The Act makes allowance for the rectification of the unlawful activity but may charge up to R2 million administration fees over and above the remediation costs.

Furthermore, NEMA makes provision for damages to be awarded by the courts where loss or damage has occurred as a result of a contravention of certain Environmental Statutes. For example, offences under the National Water Act No. 36 of 1998, the Forests Act and CARA may result in penalties being imposed in terms of NEMA. Notwithstanding the Companies Act, 2008 (Act No. 71 of 2008), or the Close Corporations Act, 1984 (Act No. 69 of 1984), the directors of a company or members of a close corporation are jointly and severally liable for any negative impact on the environment, whether advertently or inadvertently caused by the company or close corporation which they represent, including damage, degradation or pollution (Section 24N (8) added by Section 5(h) of Act 25 of 2014; Section 24N (8) of Act 62 of 2008).

Importantly, NEMA provides for the liability on conviction of employees, managers, agents and directors for any offences resulting from the failure to take all the reasonable steps that were necessary under the circumstances to prevent the commission of an offence.

3.4 The Polluter-Pays Principle

This principle provides that "*the costs of remedying pollution, environmental degradation and consequent adverse effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment."* The Polluter Pays Principle will be rigorously applied to those who cause, have caused or may cause significant pollution or degradation of the environment.

3.5 Amendments to the EMPr

Any amendments to the EMPr must be in accordance with Regulation 32 of EIA regulations 2014. Any amendments will require approval from EDTEA and/or DWS. A confirmation letter from the relevant Competent Authority (CA) approving the amendments to the EMPr must be attached as addenda.

3.6 Potential Permits/Authorisations/Licences required

Activities that could require a permit, licence, authorisation or consent use from various governmental bodies are listed in **Table 2**. The Proponent, Project Manager / Engineer and contractor is to ensure that any activity performed complies with the relevant legislation and the necessary permits are in place before commencement of the specific activity triggering the need for the relevant license or approval.

Table 1: Bridge construction activties that could require either a permit, authorisation or licence

Activity	Type of permit, consent/license required	Issuing Authority
Listed activities triggered in terms of the National Environmental Management Act 107 of 1998, EIA regulations of 2014	Approval – Environmental Authorisation	EDTEA or relevant provincial Department
Site establishment	Approval	Landowner / Local Municipality / ECO
Commencement of construction activities	Notify two (2) week prior to commencement	EDTEA / Local community
Detail design (roads design)	Approval	DoT
Taking water from a water resource (dust suppression)	Authorisation/Licence	DWS

Impeding or diverting the flow of water in a watercourse	Authorisation/Licence	DWS
Waste storage, transportation, treatment, recycling and / or disposal (including hazardous waste)	Approval – permit linked to an environmental authorisation, Weight bill	NEMA Competent Authority / Registered Landfill site
To impact on archaeological and paleontological sites or disturb burial grounds and graves	Permit	AMAFA / SAHRA

4. PRE-CONSTRUCTION, CONSTRUCTION

This pertains to all environmental impacts associated with construction and is not limited to the land on which the project is located. It includes the site footprint, construction campsites, access roads, all watercourses, as well as any other area affected or disturbed by construction activities.

Activity	Management / Mitigation	Responsibility	Frequency / Timing
A1 – Legislation, permits and agreements	**A1 – Legislation, permits and agreements**		
	a) 14 (fourteen) calendars days written notice must be submitted to EDTEA, the Local Municipality and the regional office of the DWS (Durban) indicating that the construction phase will commence. The notice must include: ▪ Site preparation activities ▪ Commencement date b) Information regarding the appointed ECO.	Pro & PM	Before any construction activities commence.
	c) EMPr approval must be granted prior to commencement of construction work; and copies of this EMPr must be kept on site by the Contractor and made available to any officials from the Departments (EDTEA / DWS / LA) on request.	Pro, PM, RE & C	Before any construction activities commence.
A2 - Environmental awareness training	**A2 – Environmental Awareness Training**		
	d) Ensure that all site personnel have a basic level of environmental awareness training, as outlined in **Section E** of this EMPr. The Contractor must allow for sufficient sessions to train all personnel.	PM & C	Before setting up construction camp and construction activities
	e) A record of all environmental awareness training courses undertaken as part of the environmental awareness training must be available on-site including staff attendance register. Environmental awareness training must also form part of the tool-box talks given.		
	f) All new staff coming onto site must receive environmental awareness training.		
A3 - Access Roads	**A3 – Access Roads**		
	a) Access to site must be via existing and planned roads only; must cause minimum disturbance to surrounding residents; must not impede traffic flow. Machine / vehicle operators must remain within demarcated access routes and exercise care in their road behaviour.	PM, Engineer, & ECO	Prior to moving onto site and during construction
	b) Pedestrian activity surrounding the construction site/s must be controlled.	C & PM	During the entire construction period
A4 .1– Construction Camp Site Establishment, setup and management ***Careful planning of the construction***	**A 4.1 – Construction camp site Establishment setup and management**		
	a) The PM, Engineer & ECO must approve the location of the camp site	PM & C	
	b) If the Construction Camp is to be established on private land, the Contractor must obtain permission from the landowner. Such permission must be articulated in a letter signed by the property owner	PM & C	Prior to moving onto site
	c) The construction camp must be located a distance of at least **50m** from the edge of delineated watercourses and be outside of the **100-year flood line**	PM, RE & C	During site establishment and on-going
	d) Adequate parking must be provided for site staff and visitors.	C, RE & PM	During site establishment and on-going
	e) The construction camp must be properly fenced and secured with a 1.8m high bonnox (or similar type) fence and locked after construction hours. It must be kept in a clean and orderly state at all times.	C, RE & PM	During site establishment and on-going

Activity	Management / Mitigation	Responsibility	Frequency / Timing
camp can ensure that time and costs associated with environmental management and rehabilitation is reduced.	f) Select a level site to minimise the chances of any soil erosion caused by storm runoff. The Contractor must attend to, monitor and manage the drainage of the campsite to avoid sheet erosion and / or standing water. Run-off from the camp site must not discharge into neighbouring properties.	C, RE & PM	During site establishment and on-going
	g) Storing of refuse outside of the camp site is prohibited.	C, RE & PM	On-going.
A4 - Camp setup *Careful planning of the construction camp can ensure that time and costs associated with environmental management and rehabilitation is reduced.*	**A4.2 Sanitation / Ablutions Facilities**		
	a) Temporary chemical toilets must be provided by a reputable company. Such facilities must be maintained in a clean and hygienic condition; toilet paper must be provided. The toilets must be serviced at least once weekly.	PM, RE & C	During setup, with On-going monitoring as the work progresses.
	b) The use of surrounding bush, rivers or degraded areas as a toilet facility is strictly forbidden.	PM, RE & C	On-going.
	c) Records of toilet maintenance & sewage removal must be kept on site	PM, RE & C	On-going.
	d) Portable toilets must be placed more than 50m away from the stream and must not cause pollution to the surrounding environment, including wetland or groundwater sources. They must be placed on a level and secure base	PM, RE & C	During setup and On-going
	e) There must be a minimum of **1 toilet for every 7 workers**. The toilets must be installed on an impervious, stable base.	PM, RE & C	During setup and On-going
	f) Storage facilities must be protected from the ingress of storm water from surrounding areas to ensure accidental spillage does not pollute local soil and ground water resources.	PM, RE & C	During setup and On-going
	g) Females must have a separate toilet from male workers. Male and female toilets must be positioned in separate areas.	PM, RE & C	During setup and On-going
. **A4.3 – General substances and materials location**	**A4.3 – General substances and materials location**		
	a) Construction materials and equipment must be stored inside containers situated within the construction campsite. Impervious surfaces, demarcation, bunded areas or lipped drip trays must be provided where necessary.	PM, C & RE	During site setup and On-going.
	b) Portable construction equipment (e.g. generators) must be located on an impervious surface or alternatively, lipped drip trays to be provided.	PM, C & RE	On-going
	c) Drip trays must be placed under all construction vehicle / machinery parked on site and not in use.	PM, C & RE	On-going
A4.4 Hazardous Substances	**A4.4 –Hazardous substances**		
	a) Areas used to store hazardous substances must be suitably signed, fenced and access controlled and must be on an impermeable bunded surface that is protected from the ingress of storm water.	PM, C & RE	During site setup and On-going.
	b) Fuel tanks must meet relevant specifications and be bunded and elevated so that leaks are easily detected. Bunded areas must be able to contain 110% of the volume of liquids being stored.	PM, C & RE	During site setup and On-going.

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	c) Material Safety Data Sheets (MSDSs) must be readily available on site for all chemicals and hazardous substances to be used on site, this includes diesel. MSDSs must include information on ecological impacts and measures to minimise impacts during accidental releases or escapes.	PM, C & RE	During site setup and On-going.
	d) Spill kits must be available on site and staff must be properly trained on the use of spill kits.	PM, C & RE	During site setup and On-going.
	e) All equipment must be checked regularly for oil and fuel leaks before it is operated. Leakages must be repaired on mobile equipment or containment trays placed underneath immobile equipment until such equipment has been repaired.	PM, C & RE	On-going.
	f) Dispose of old oil, grease, diesel and petrol in specified containers provided and marked accordingly. Always ensure that the lid of the disposal container is closed /tightened. Used oil/grease MUST be recycled.	PM, C & RE	On-going.
	g) Soil that is contaminated with, e.g. petrochemicals or paint must be disposed of at a registered hazardous landfill site. Waybills for such disposal must be kept on site for record purposes.	PM, C & RE	On-going.
	h) Bitumen, bitumen sealer, concrete must be progressively cleared, removed and disposed of at a licensed hazardous waste site.	PM, C & RE	On-going.
	i) In the event of a spillage/incident, the Local Authority, DWS, DEDTEA (Pollution and Waste Management), and the Local Fire Department must be informed of the incident.	PM, C & RE	On-going
A5 - Water supply management	**A5 - Water supply management**		
	(a) Should water abstraction be required and the necessary authorisation from DWS and permission from the landowner has been received, contractor ensure the following: I. Suitable water must meters installed to ensure that the abstracted volumes are measured or recorded on a daily basis. II. The vehicle abstracting water from a river/stream does not enter or cross it and does not operate from within the river/stream. III. No damages occur to the river/stream bed or banks and that the abstraction of water does not entail stream diversion activities.	Pro, C, RE & PM	Prior to commencement of construction activities and On-going
	b) Ensure that an existing potable water source is maintained for domestic use during construction.	C, RE & PM	During staff induction and on
A6 - Public consultation	**A6 - Public consultation - communication between the contractor and I&APs**		
	a) A site notice (i.e. a public notice) must be erected on the construction site camp giving contact details of the Project Manager, the Contractor and the ECO.	Pro, C, PM, RE & ECO	Prior to construction commencement an ongoing.
	b) A complaints register must be kept on site. This must be in two carbon copy formats, with numbered pages. Complaints must be efficiently dealt with. Details of complaints must be incorporated into the audits as part of the monitoring process.	Pro, C, PM, RE & ECO	Prior to construction commencement an ongoing.
A7 - Traffic management	**A7 - Traffic management**		
	a) Surrounding residents must be notified in advance of any known potential risks associated with the construction site and the activities on it	RE, C, PM	During site setup and On-going
	b) The necessary traffic safety warning signage must be erected during the emergency work to warn motorists and pedestrians of the potential dangers of the construction site.	RE, C, PM	During site setup and On-going
	c) Flammable materials must be stored as far as possible from existing buildings and sensitive receptors. Firefighting equipment must be present on site at all times.	RE, C, PM	During site setup and On-going
	d) Road safety measures must be adequately defined with the necessary road warning signage or Stop/Go controls.	RE, C, PM	During site setup and On-going
	e) Flagmen must be used to control the traffic flow.	RE, C, PM	During site setup and On-going

Activity	Management / Mitigation	Responsibility	Frequency / Timing
A8 - Traffic management	**A8 – Sourcing of Material**		
	a) The sourcing of materials must be undertaken from a legal borrow pits and quarries in terms of the Minerals and Petroleum Resources Development Act (Act No.28 of 2002) regulated by the Department of Mineral Resources (DMR).	Pro, C, PM & RE	Prior to construction commencement.
	b) Materials must be obtained from a registered commercial source in the case a borrow pit permit cannot be secured from DMR.	Pro, C, PM & RE	Prior to construction commencement an ongoing.

5. CONSTRUCTION PHASE FOR THE BALAMHLANGA RIVER BRIDGE - ENVIRONMENTAL MANAGEMENT CONTROLS

This pertains to all environmental impacts associated with the emergency works construction and is not limited to the land on which the Project is to be located. It includes the site footprint, construction campsites (if any), access roads, detour and tracks, as well as any other area affected or disturbed by construction activities. Furthermore, the EMPr must take into account all secondary impacts on the local community and the general public.

Management Objectives:

- To ensure that all construction related activity is undertaken in terms of recognised Good Practise Principles and with due regard to effective environmental management requirements that will prevent or limit any negative impacts from occurring.
- To avoid, manage and mitigate potential impacts to the environment caused by the incorrect storage, handling and disposal of general and hazardous solid waste.
- To reduce potential erosion and sedimentation as a result of stockpiling of materials

Activity	Management / Mitigation	Responsibility	Frequency / Timing
C1 - Solid waste management	**C1 - Solid waste management**		
	a) The contractor is responsible for the collection of refuse and its transport to a registered landfill site facility. Copies of waybills must be kept on site.	C, PM & RE	On-going
	b) Sufficient, covered waste collection bins (scavenger and weatherproof) or at least 200litre drum with lid and clearly identified as the point for waste disposal must be provided.	C, PM & RE	On-going
	c) Chemical waste must be stored in appropriate containers and disposed of at licensed hazardous disposal facilities. Proof must be maintained on file.	C, PM & RE	On-going
	d) Recycling is encouraged by providing separate receptacles for different types of waste and making sure that staff are aware of their uses.	C, PM& RE	On-going
	e) Burning of waste is forbidden. A possible exception to this may be that the alien invasive vegetation which is removed from the site must be burned to prevent the spread of the plants. ECO to advise.	C, PM, ECO & RE	On-going
	f) All waste material prior to being collected for safe disposal, must be stored under cover and within a designated waste collection/storage area so as not to cause any surface or a health hazard. Access control to this area must be properly managed.	C, PM & RE	During setup and throughout the project
	g) Bitumen, bitumen sealer, concrete must be progressively cleared, removed and disposed of at a licensed hazardous waste site.	C, PM & RE	On-going

Activity	Management / Mitigation	Responsibility	Frequency / Timing
C2.1 - Topsoil and stockpiling	**C2.1 - Topsoil and stockpiling**		
	a) Once the **approved** areas have been cleared of trees, large shrubs and /or alien vegetation; **the top soil layer between 200 and 300 mm must be removed** and stockpiled in mounds or berms no more than 2m in height in a designated area for use during progressive rehabilitation. Stockpiling must occur for the shortest possible time in order to help minimise propagule death.	C, PM, ECO & RE	During setup and throughout the project
	b) All topsoil must be stored on an area of level ground that will not be in the path of runoff water during a storm, away from the working area, drainage lines, areas of valuable vegetation or on the bases of banks. A mulch cover or hessian sheets must be used to protect this soil from erosion – either by wind or water.	C, PM, ECO & RE	During setup and throughout the project
	c) Topsoil must not be compacted in any way, nor should any object be placed or stockpiled upon this soil.	C, PM & RE	On-going
	d) Topsoil stripped from the construction camp and other construction areas must be stockpiled away from any potential disturbances.	C, PM & RE	On-going
	e) Do not strip topsoil when it is wet.	C, PM & RE	On-going
	f) Topsoil must be handled twice only – once to strip and stockpile, and secondly to replace, level, shape and scarify. Maintain topsoil stockpiles in a weed free condition.	C, PM & RE	On-going
	g) Topsoil must be stockpiled separately from subsoil. Make sure that at no time is topsoil mixed with subsoil, spoil, and building rubble.	C, PM & RE	On-going
	h) Grubbing is strictly prohibited.	C, PM & RE	On-going
	i) All soils compacted as a result of construction activities must be ripped and profiled.	C, PM & RE	On-going
	j) Stockpiles must not be situated such that they obstruct natural drainage lines or 50 metres from any watercourse.	C, PM & RE	On-going
	k) Stockpiling of soil or any other material used during the construction phase must not be allowed on or near steep slopes, near a watercourse or water body. This is to prevent pollution or the impediment of surface runoff.	C, PM & RE	During setup and throughout the project
	l) All stockpile sites must be appropriately rehabilitated once construction activities have ceased.	C, PM, ECO & RE	On-going
	m) The existing gravel wearing course material must be stockpiled for use as a subbase layer for the new asphalt road.	C, PM & RE	On-going
	n) Stockpiling of soil or any other material used during the construction phase must not be allowed on or near steep slopes, near a watercourse or water body. This is to prevent pollution or the impediment of surface runoff.	C, PM & RE	During setup and throughout the project
	o) All stockpile sites must be appropriately rehabilitated once construction activities have ceased.	C, PM, ECO & RE	On-going
	p) Any unused topsoil that remains after the completion of the project must be spread at a designated area by the project Engineer and use in the rehabilitation of eroded areas in the vicinity.	C, PM, ECO & RE	On-going
C3 - Storm water damage prevention and management	**C3 - Storm water damage prevention and management**		
	a) Clearing activities must only be undertaken during agreed working times and permitted weather conditions. If heavy rains are expected, clearing activities should be put on hold. In this regard, the contractor must be aware of weather forecasts.	Pro, PM, ECO, C & RE	On-going
	b) Construction activities should be scheduled to minimise the duration of exposure to bare soils on site, especially on steep slopes.	Pro, PM, ECO, C & RE	On-going
	c) The unnecessary removal of groundcover from slopes must be prevented, especially on steep slopes.	Pro, PM, ECO, C & RE	On-going
	d) All bare slopes and surfaces to be exposed to the elements of weather during clearing and earthworks must be protected against erosion using rows of silt fences and/or sandbags to break the energy of surface flows.	Pro, PM, ECO, C & RE	On-going
	e) Sediment barriers (e.g. silt fences, sandbags, etc.) must be established along the riverbanks to capture sediment before entering the river. Sediment barriers should be regularly maintained and cleaned to ensure effective drainage. Breaching of such barriers must be avoided.	Pro, PM, ECO, C & RE	On-going

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	f) All exposed/bare surfaces and embankments must be re-vegetated immediately in order to prevent any damage to rivers	Pro, PM, ECO, C & RE	On-going
	g) If re-vegetation of exposed surfaces cannot be established immediately due to phasing issues, rows of silt fences and sandbags of vegetation must be established along the contours at regular intervals to capture eroded sand.	Pro, PM, ECO, C & RE	On-going
	h) The berms, sandbags and/or silt fences must be monitored for the duration of the construction phase and repaired immediately when damaged. The berms, sandbags and silt fences must only be removed once vegetation cover has successfully re-colonised the embankments.	Pro, PM, ECO, C & RE	On-going
	i) Concentration of storm water should be prevented where possible, but energy dissipaters should be provided in areas of concentration i.e. rip rap[1], reno mattresses[2], gabions, baffle blocks or rocks/stones.	Pro, PM, ECO, C & RE	On-going
	j) After every rainfall event, the contractor must check the site for erosion damage and rehabilitate this damage immediately.	Pro, PM, ECO, C & RE	On-going
	k) All erosion gullies, channels and runnels that develop on the sites must be backfilled and compacted, so that the affected areas are restored to an acceptable condition, immediately on discovery.	Pro, PM, ECO, C & RE	On-going
C4 - Protection of watercourses and water bodies	**C4 - Protection of watercourses and water bodies**		
	a) Activities directly impacting on wetlands and channel watercourse must occur during the dry winter months (low or zero flow periods) in order to limit the potential impact linked to high runoff rates.	RE, C, PM & ECO	On-going monitoring
	b) Any construction activities within the stream must be restricted to a work servitude of 40 m of the new bridge and road realignment. Areas earmarked for construction must be marked to ensure a controlled disturbance footprint area.	RE, C, PM & ECO	On-going monitoring
	c) Water on the road must be diverted away immediately to minimise the amount of water running directly from the road into all the HGM.	RE, C, PM & ECO	On-going monitoring
	d) Under no circumstance may water containing waste be discharged into the water resources/natural environment. Measures to contain the water containing waste and to safely dispose of it must be implemented.	RE, C, PM & ECO	On-going monitoring
	e) The use of equipment/plant operating within watercourse (wetlands and stream) is discouraged. Work must be undertaken by hand.	RE, C, PM & ECO	On-going monitoring
	f) There must be no soil/sand excavation from the banks of the stream.	RE, C, PM & ECO	On-going monitoring
	g) No mining of soil / sand required for construction purposes from stream banks, channels or wetlands is allowed. Sand brought in must be stockpiled away from the stream and wetlands edge;	RE, C, PM & ECO	On-going monitoring
	h) Water diversions must be monitored, with only one diversion made at a time and the natural flow of the stream must be maintained at all time.	RE, C, PM & ECO	On-going monitoring
	i) All watercourses and water bodies must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils, fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the Contractor's activities.	RE, C, PM & ECO	On-going monitoring
	j) In the event of a spill, prompt action must be taken to clear the polluted or affected areas immediately in accordance with the spill contingency plan provided in this document.	RE, C, PM & ECO	On-going monitoring
	k) No construction equipment must traverse any wetland areas.	RE, C, PM & ECO	On-going monitoring

[1] Rip Rap: A layer of crushed stone placed on the bottom and sides of the channel protects the channel and dissipates the energy of the high velocity flow.

[2] Reno mattress: rectangular baskets made of heavily galvanized, double twisted, steel woven wire mesh. The single unit constructed baskets are assembled, laced together and then filled with stone to form a monolithic structure.

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	l) No natural watercourse or water body must be used for the purposes of personal washing and the washing of machinery or clothes.	RE, C, PM & ECO	On-going monitoring
	m) Excavation or construction in a water course or wetland area must be avoided unless exceptional circumstances require that excavation or construction cannot be avoided.	RE, C, PM & ECO	On-going monitoring
	n) All equipment must be checked regularly for oil and fuel leaks before it is operated. Leakages must be repaired on mobile equipment or containment trays placed underneath immobile equipment until such equipment has been repaired.	RE, C, PM & ECO	On-going monitoring
	o) The contractor is to put in place a bedim curtain that transverses the stream/drainage line. This curtain must be placed 3-meters from the end of the work-face and is to be in place throughout the construction period including after hours and over weekends until such time as ALL construction work has ceased; the site has been cleared up and rehabilitation has been completed.	RE, C, PM & ECO	On-going monitoring
	p) It is recommended that two such bedim curtains are available to that they can be swapped out daily.	RE, C, PM & ECO	On-going monitoring
	q) The bedim curtain must be fixed to two sturdy poles which are then imbedded into the stream banks in such a way as to allow the bottom of the curtain to lie on the stream/drainage-line bed by approximately 30cm.	RE, C, PM & ECO	On-going monitoring
	r) The bottom of the curtain must be folded so that it faces upstream. It should then be weighted down with rocks or cleaned bricks so as to ensure that it does not lift.	RE, C, PM & ECO	On-going monitoring
	s) At the end of each workday the curtain is to be carefully lifted from the stream/drainage-line bed and removed in such a way as to not allow any of the material/substances that have been caught by the curtain to spill. It must be cleaned in a bunded area so all such debris can be collected and removed off site.	RE, C, PM & ECO	On-going monitoring
	t) A clean and undamaged curtain must be put in place prior to any further work commencing.	RE, C, PM & ECO	On-going monitoring
	u) Damaged curtains must be replaced immediately upon discovery.	RE, C, PM & ECO	On-going monitoring
	v) **Aquatic specialist recommendation:** A conceptual riverine rehabilitation and monitoring plan with a focus on erosion and alien vegetation management, should be compiled in order to manage the rehabilitation of affected watercourse after the construction of the proposed crossing. The rehabilitation plan should make provision for an aquatic biomonitoring survey which includes an assessment of water quality, habitat, SASS5 and fish	RE, C & PM	During site setup, and On-going monitoring.
	w) Aquatic specialist recommendation: A detailed method statement for working within the watercourse must be compiled by the contractor prior to the commencement of the project.	RE, C & PM	During site setup, and On-going monitoring.
	x) If pollution of any surface or groundwater occurs, or any significant spillage of chemicals, fuels, etc. it must be immediately reported to DEDTEA, DWS and relevant Local Authority.	RE, C, PM & ECO	On-going
C5.1 - Conservation of the natural environment	**C5.1 - Protection of Flora (Vegetation Clearing)**		
	a) Detailed, colour photographs must be taken of the proposed site before the clearing may commence. These records are to be kept on site by the contractor for consultation with the appointed ECO during the rehabilitation of the site.	RE, C, PM & ECO	During site setup, and On-going monitoring.
	b) Construction activities around the area where damage to plants and natural features is likely to occur must be strictly controlled.	RE, C, PM & ECO	During site setup, and On-going monitoring.
	c) Remove all invasive alien plants on the construction site.	RE, C, PM & ECO	On-going
	d) Workers must be limited to areas under construction and access outside of the working servitude is prohibited.	RE, C, PM & ECO	On-going
	e) The use of herbicides must be in compliance with the terms and conditions of The Fertilisers, Farm, Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act 36 of 1947).	RE, C, PM & ECO	On-going and during rehabilitation
	f) A reputable company must be hired to undertake herbicide application. The ECO must be available to monitor/supervise this activity.	RE, C, PM & ECO	On-going and during rehabilitation

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	g) All protected species and sensitive vegetation not removed must be clearly marked and such areas fenced off or demarcated.	RE, C, PM & ECO	On-going
	h) Harvesting and collection of any flora is strictly prohibited.	RE, C, PM & ECO	On-going
	i) Any protected trees and plants that are removed must be replaced at a ratio of 1:10 (10 trees/plants must be planted for every 1 tree/plant removed).	RE, C, PM & ECO	On-going and during rehabilitation
	j) A detailed vegetation survey must be undertaken by an appropriately qualified and experienced botanist. The survey must take place during the growing season between November and early April and not during the winter months (May to October). If any protected species are found the necessary plant pruning, destruction and / or relocation permits must be obtained from the relevant authorities (EKZNW / DFFE) and protected plants must either be offset at a ratio of 1:3 or relocated as necessary prior to any construction commencing on site. A plant search and rescue report must be compiled, which contains the specifications around pruning, offsetting and / translocation of plants as necessary.	RE, C, PM & ECO	On-going
	k) The Contractor must provide workers, equipment and plant to assist in the translocation of the plants as necessary.	RE, C, PM & ECO	On-going
	l) The botanist that undertook the detailed the pre-construction vegetation survey must be present onsite for the duration of the necessary plant translocation process to advise the contractor.	RE, C, PM & ECO	On-going
	m) The necessary plant translocation process must be undertaken in accordance with all permit requirements and advice.	RE, C, PM & ECO	On-going
	n) Plant species which have been translocated must be maintained according to the recommendations of the search and rescue contractor and/ or botanist responsible for completing the pre-construction survey.	RE, C, PM & ECO	On-going
	o) No vegetation may be cleared without prior written approval from the Engineer who shall be advised by the ECO.	RE, C, PM & ECO	On-going
	p) Rehabilitation must not be reserved for the end of construction, but must be completed systematically throughout the construction period to prevent areas being left bare for extended periods	RE, C, PM & ECO	On-going
C5.2 - Protection of Fauna	**C5.2 - Protection of Fauna**		
	a) Construction activities must not interfere or cause fatalities to animals (both wild and farm animals).	RE, C, PM & ECO	On-going
	b) Site workers are to be informed of any sensitive fauna on the site prior to construction activities commencing and be informed that poaching or disturbance is strictly prohibited.	RE, C, PM & ECO	On-going
	c) Under no circumstances shall any fauna be handled, removed, killed or interfered with by the Proponent, Project Manager, Resident Engineer, contractors, engineers, and their employees, including subcontractors or their subcontractors' employees. However, if construction activities are likely to injure, kill or interfere with any fauna encountered on the site, appropriate action must be taken to ensure their protection.	RE, C, PM & ECO	On-going
	d) Any fauna found within the construction corridor must be moved to the closest point of natural or semi-natural vegetation outside the construction servitude. This includes those species perceived to be vermin (such as snakes and rats).	RE, C, PM & ECO	On-going
	e) Breeding sites must be kept intact and disturbance to breeding birds must be avoided. Special care must be taken where nestlings or fledglings are present.	RE, C, PM & ECO	On-going
	f) No poaching must be tolerated under any circumstances. All animal dens in close proximity to the works areas must be marked as No-Go areas.	RE, C, PM & ECO	On-going
C6 - Social impacts.	**C6 – Social Impacts**		
	C6.1 - Protection of Heritage resources		

Activity	Management / Mitigation	Responsibility	Frequency / Timing
C6.1 – Protection of Heritage Resources	a) AMAFA must be contacted if any heritage objects, artefacts or graves are uncovered during earthmoving activities and all work on site is to cease until further notice; as well as the ECO is to be notified for comment. Construction may only commence once approval by AMAFA is granted. AMAFA contact details are provided below: AMAFA aKwaZulu-Natali Pietermaritzburg Office Contact Details: P.O. Box 2685, Pietermaritzburg Tel: 033 394 6543 Fax: 033 342 6097 lindim@amafapmb.co.za	RE, C, PM & ECO	On-going
	b) All graves outside formal cemeteries must not be disturbed, damaged, altered or exhumed and relocated without a permit from AMAFA and written permission of relatives or concerned families in this community.	RE, C, PM & ECO	On-going
	c) No structures older than sixty years or parts thereof are allowed to be demolished altered or extended without a permit from AMAFA.	RE, C, PM & ECO	On-going
	d) No activities are allowed within 50m of a site, which contains rock art.	RE, C, PM & ECO	On-going
	e) 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 mineral act.	RE, C, PM & EC	During site setup and On-going monitoring.
	f) Prior to the commencement of construction, all staff need to know what possible archaeological or historical objects may look like, and to notify the Engineer / Project Manager / Contractor should such an item be uncovered.	RE, C, PM & EC	During site setup, and On-going monitoring.
	g) In the case of the ECO or the Site Manager becoming aware of suspicious looking palaeomaterial, the chance find protocol as per the PIA and Appendix G of this EMP must be followed.	RE, C, PM & EC	During site setup, and On-going monitoring.
	h) If potential palaeomaterial is discovered, construction must be halted in that specific area and the Palaeontologist must be given enough time to reach the site and remove the material before excavation continues.	RE, C, PM & EC	During site setup, and On-going monitoring.
	i) Mitigation will involve the attempt to capture all rare fossils and systematic collection of all fossils discovered. This will take place in conjunction with descriptive, diagrammatic and photographic recording of exposures, also involving sediment samples and samples of both representative and unusual sedimentary or biogenic features. The fossils and contextual samples will be processed (sorted, sub-sampled, labelled, and boxed) and documentation consolidated, to create an archive collection from the excavated sites for future researchers.	RE, C, PM & EC	During site setup, and On-going monitoring.
C6.2 - Dust Emission	**C6.2 – Dust emissions**		
	a) Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust cloud is present.	RE, C, PM	On-going
	b) Heavy machinery and vehicle speeds must not exceed 30km/h for all vehicles travelling to and from the construction site.	RE, C, PM	On-going
	c) Appropriate dust suppression measures must be used when dust generation is unavoidable, e.g. dampening with water; or spraying from a water tanker along the site.	RE, C, PM	On-going
	d) It must be ensured that, during transport, loads of loose material (such as sand, gravel etc.) on trucks is covered and/or dampened.	RE, C, PM	On-going
	e) Do not exceed the freeboard levels when transporting construction related materials.	RE, C, PM	On-going
	C6.3 – Noise Pollution		

Activity	Management / Mitigation	Responsibility	Frequency / Timing
C6.3 - Noise Pollution	a) During the construction phase, operational hours must be between 07h00 and 17h00 Monday – Friday to avoid sleep/rest disruption and general disturbance of adjacent land users.	RE, C, PM	On-going
	b) Noise levels are to comply with all relevant guidelines and regulations such as SANS 10103: 2008.	RE, C, PM	On-going
	c) All machinery must be serviced at regular intervals in order to ensure that they do not emit unnecessary noise.	RE, C, PM	On-going
	d) All vehicles and machinery must be fitted with appropriate silencing technology that must be properly maintained.	RE, C, PM	On-going
	e) The use of all plant and machinery must be appropriate to the task required in order to reduce noise levels.	RE, C, PM	On-going
C6.4 - Visual Impacts	**C6.4 - Visual impacts**		
	a) Storage facilities, elevated tanks and other temporary structures on site must be located such that they have as little visual impact on local residents as possible.	RE, C, PM	During site setup and On-going
	b) All activities must be completed during the day so there is no need for extensive lighting of the operational area after dark.	RE, C, PM	During site setup and On-going
	c) Lighting on the construction site must be pointed downwards and away from oncoming traffic and nearby houses. Lighting must help provide maximum security by enabling policing of the site, without creating a visual nuisance to local residents or businesses	RE, C, PM	During site setup and On-going
C6.5 – Fire Prevention	**C6.5 - Fire Prevention**		
	a) Firefighting equipment must be present on site at all times as per the Occupational Health and Safety Act of South Africa (OHSA).	RE, C, PM	During site setup and On-going
	b) Flammable materials must be stored as far as possible from existing buildings and sensitive receptors.	RE, C, PM	On-going
	c) Educate workers on the dangers of open and/or unattended fires.	RE, C, PM	During site setup and On-going
	d) No open fires must be allowed on site under any circumstances.	RE, C, PM	On-going
	e) Contact numbers for the local Fire Protection Agency and emergency services must be communicated in environmental awareness training and displayed at a central location on site.	RE, C, PM	On-going
C6.6 – Road Safety, disturbance of traffic and Safety of the public	**C6.6 - Road safety, disturbance of traffic and Safety of the public**		
	a) Potentially hazardous areas such as excavated trenches, open excavations or pits areas are to be adequately demarcated and made clearly visible at **ALL** times.	RE, C, PM	On-going
	b) Material stockpiles or stacks must be stable and well secured or demarcated to avoid collapse and possible injury to site workers / local residents.	RE, C, PM	On-going
	c) The Contractor must warn workers and visitors of any dangerous working areas and activities.	RE, C, PM	During site setup and On-going
	d) Personnel working on site must be provided with protective clothing and any other protection that may be necessary, to prevent injury while on duty.	RE, C, PM	During site setup and On-going
	e) The Contractor must ensure that construction personal have access to some form of medical treatment in case injuries occur; e.g. first aid tools.	RE, C, PM	During site setup and On-going
	f) There must be 24 hr. access control to the construction camp site at all times and no unauthorised person must be permitted to enter the construction site without prior permission of the Project manager or Contractor.	RE, C, PM	During site setup and On-going
	g) Warning signs regarding the construction activities must be erected to warn pedestrians and drivers in the area.	RE, C, PM	During site setup and On-going

Activity	Management / Mitigation	Responsibility	Frequency / Timing
	h) Adequate and safe passage for pedestrians and road users through the construction site must be provided, controlled and maintained at all times; this will decrease the risk of accidents.	RE, C, PM	During site setup and On-going
	i) Additional signage must be kept in storage on the construction site for replacement of missing and damaged signage.	RE, C, PM	On-going

6. POST-CONSTRUCTION & PROGRESSIVE REHABILITATION

This pertains to all environmental impacts associated with post construction (demolishing of the construction camp and the actions that need to be implemented) and is not limited to the land on which the Project is to be located. It includes the site footprint, construction campsites, access roads and tracks, as well as any other area affected or disturbed by construction activities.

Activity	Management / Mitigation	Responsibility	Frequency / Timing
D1 - Construction camp	**D1 - Construction camp rehabilitation**		
	a) All structures comprising the construction camp are to be removed from site and all material used for construction and maintenance must be removed from site after construction or maintenance work in a particular area so that rehabilitation can commence as soon as possible.	C, PM, RE & ECO	Project completion
	b) Fences, barriers and demarcations associated with the construction phase are to be removed from the site unless stipulated otherwise by the Engineer.	C, PM, RE & ECO	Project completion
	c) The area that previously housed the construction camp must be checked for spills of oil, paint and fuels, etc. and removed.	C, PM, RE & ECO	Project completion
	d) All hardened surfaces within the construction camp must be **ripped** (scarification is inadequate and will not be accepted), all imported materials removed, and the area must be top-soiled and re-vegetated. ECO / rehabilitation specialist to advise as to suitably appropriate species to be planted.	C, PM, RE & ECO	Project completion
	e) The Contractor must arrange for the cancellation of all temporary services.	C, PM & RE	Project completion
	f) All soil retention and stabilisation mechanisms and structural requirements must be complete prior to re-vegetation of plants used for rehabilitation purposes.	PM, RE, C& ECO	Project completion
	g) The site must be cleared of all litter, rubble and domestic waste associated with the construction; this includes the removal of surplus materials, excavation and disposed of at a registered landfill.	C, PM, RE & ECO	Project completion
	h) All temporary bunds / spill trays must be removed from site. Materials that will not be re-used must be disposed of as hazardous waste.	C, PM, RE & ECO	Project completion
	i) Soil contaminated by hydrocarbons, for example from leaking machines, refuelling spills etc., is to be excavated to the depth of contamination penetration, placed in drums and removed to a registered hazardous landfill site.	C, PM, RE & ECO	Project completion
	j) All temporary works and stockpiles must be removed.	C, PM, RE & ECO	Project completion

D2 - Land rehabilitation	**D2 - Land rehabilitation**		
	a) All areas disturbed by construction activities must be subject to landscaping and rehabilitation;	C, PM, RE & ECO	Project completion
	b) All embankments, slopes and constructed drainages are to be shaped and topsoil reapplied by hydroseeding with an indigenous grass mix such as *Andropogon eucomus* (Snowflake grass), *Aristida bipartita* (Rolling grass), *Aristida congesta* (Three awn grass), *Cynodon dactylon* (Couch grass), *Elionurus muticus* (Wire grass), *Eragrostis capensis* (Heart-seed love grass), *Hyparrhenia hirta* (Common thatching grass).	C, PM, RE & ECO	Project completion
	c) Stockpiled topsoil must be used for rehabilitation.	C, PM, RE & ECO	Project completion
	d) Execute top soiling activity prior to the rainy season or any expected wet weather conditions.	C, PM, RE & ECO	Project completion
	e) Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed.	C, PM, RE & ECO	Project completion
	f) Subsoil must be ripped before topsoil is placed.	C, PM, RE & ECO	Project completion
	g) Place topsoil in the same area from where it was stripped. If there is insufficient topsoil available from a particular soil zone to produce the minimum specified depth, topsoil may be brought from other areas of similar quality. The ECO will advise.	C, PM, RE & ECO	Project completion
	h) Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion.	C, PM, RE & ECO	Project completion
	i) Tilled / ripped subsoil must be covered with a 150 mm – 200 mm deep layer of topsoil. This requirement supersedes ALL other tender specifications.	C, PM, RE & ECO	Project completion
	j) Rip and / or scarify all areas following the application of topsoil to facilitate mixing of the upper most layers. The ECO will specify whether ripping and / or scarifying is necessary, based on the site conditions immediately before these works begin.	C, PM, RE & ECO	Project completion
	k) Rip and / or scarify along the contour to prevent the creation of down-slope channels.	C, PM, RE & ECO	Project completion
	l) Do not rip and / or scarify areas under wet conditions, as the soil will not break up.	C, PM, RE & ECO	Project completion
	m) Berms that have been created must have a slope of 1:4 and be replanted with indigenous species and grasses.	C, PM, RE & ECO	Project completion
D3 - Soil erosion control - Slope protection	**D3 - Soil erosion control - Slope protection**		
	a) Areas sensitive to erosion must be identified and monitored to ensure that erosion risks are minimised.	C, PM, RE & ECO	Project completion and On-going
	b) Measures to prevent excessive soil erosion must be implemented. These measures could include the use of sandbags, hessian sheets, retention or replacement of vegetation.	C, PM, RE & ECO	Project completion and On-going
	c) Install sandbags and silt fences along slopes at regular contours/spacing (2-5m depending on slope angle) to slow down the flow of water.	C, PM, RE & ECO	Project completion
	d) Construct stormwater diversion berms to divert water away from slopes to well vegetated areas not associated with the water courses.	C, PM, RE & ECO	Project completion and On-going
	e) Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effective and erosion is controlled as per the instruction from the ECO.	C, PM, RE & ECO	Project completion
	f) Banks must be revegetated with an indigenous grass seeding mix or as advice from the ECO	C, PM, RE & ECO	Project completion and On-going
	g) Deep rooted trees or shrubs must also be used to revegetate bank. ECO to advise on appropriate species.	C, PM, RE & ECO	Project completion and On-going
	h) Topsoil with a thickness layer of between 150mm to 300m must be used on slopes with a gradient less than 20°.	C, PM, RE & ECO	Project completion
	i) Topsoil with a thickness layer greater than 150 mm but not exceeding between 150mm to 200m must be used on slopes with a gradient greater than 20°.	C, PM, RE & ECO	Project completion

<table>
<tr><td rowspan="14">D4 - Vegetation</td><td colspan="3">D4 - Re-vegetation</td></tr>
<tr><td>a) All disturbed soils must be rehabilitated with local plant species to ensure that alien vegetation does not invade the area. Indigenous species must be used for replanting.</td><td>C, PM, RE & ECO</td><td>Project completion and On-going</td></tr>
<tr><td>b) Ongoing alien plant control must be undertaken along the bridge and particularly in the disturbed wetland and riparian areas.</td><td>C, PM, RE & ECO</td><td>Project completion and ongoing</td></tr>
<tr><td>c) Re-vegetation planting must be undertaken in spring if possible, to ensure that establishment is successful.</td><td>C, PM, RE & ECO</td><td>Project completion and ongoing</td></tr>
<tr><td>d) All exposed earth (within the development area) must be rehabilitated promptly with suitable vegetation to protect the soil.</td><td>C, PM, RE & ECO</td><td>Project completion</td></tr>
<tr><td>e) Necessary rehabilitation and landscaping measures (e.g. seeding, removing alien plants etc.) must be undertaken to ensure species composition reverts to a natural state. Indigenous vegetation with deep-set root systems is advisable in order to limit further soil loss on site.</td><td>C, PM, RE & ECO</td><td>Project completion and On-going</td></tr>
<tr><td>f) All areas must be properly ripped and scarified prior to any re-vegetation taking place.</td><td>C, PM, RE & ECO</td><td>Project completion</td></tr>
<tr><td>g) Planting must be carried out as soon as construction is complete in a section in order to prevent soil erosion and the invasion of alien plant species onto the site. The ethos of progressive rehabilitation must be adopted.</td><td>C, PM, RE & ECO</td><td>Project completion and On-going</td></tr>
<tr><td>h) All planting programs are to source indigenous plant material from within a 50km radius.</td><td>C, PM, RE & ECO</td><td>Project completion</td></tr>
<tr><td>i) Locally harvested material must be free of alien and invader plants/seeds.</td><td>C, PM, RE & ECO</td><td>Project completion</td></tr>
<tr><td>j) The Contractor will be held liable for the replacement of any plant or feature under the protection of these specifications that is removed or damaged by the Contractor’s negligence or mismanagement.</td><td>C, PM, RE & ECO</td><td>Project completion</td></tr>
<tr><td>k) Encroachment of invasive alien plants must be monitored on a regular basis to prevent re-infestation as per the invasive alien plant control plan.</td><td>C, PM, RE & ECO</td><td>Project completion and On-going</td></tr>
<tr><td>l) Planting Recommendations for use in rehabilitation:
The following tree and grass species are recommended as a guideline, this list may be revised by the ECO as required.
<table>
<tr><th>Scientific Name</th><th>English Name</th><th>Life form</th><th>Habitat</th></tr>
<tr><td>Andropogon eucomus</td><td>Snowflake grass</td><td>Graminoid</td><td>Grassland</td></tr>
<tr><td>Senegalia caffra</td><td>Hook thorn</td><td>Tree</td><td>Grassland</td></tr>
<tr><td>Vachellia sieberiana var. woodii</td><td>Paperbark Acacia</td><td>Tree</td><td>Grassland/Thornveld</td></tr>
<tr><td>Barleria obtusa</td><td>Bush violet</td><td>Groundcover</td><td>Grassland</td></tr>
<tr><td>Combretum molle</td><td>Velvet bushwillow</td><td>Tree</td><td>Grassland/Thornveld</td></tr>
<tr><td>Dovyalis caffra</td><td>Kei-apple</td><td>Tree</td><td>Wetland/riverine</td></tr>
<tr><td>Desmodium repandum</td><td>Orange Desmodium</td><td>Shrublet</td><td>Grassland/Forest</td></tr>
<tr><td>Justicia petiolaris</td><td>Blue Justicia</td><td>Shrublet</td><td>Grassland/Forest</td></tr>
<tr><td>Kigelaria africana</td><td>Pink wood</td><td>Tree</td><td>Anywhere</td></tr>
<tr><td>Rauvolfia caffra</td><td>Quinine tree</td><td>Tree</td><td>Wetland/riverine</td></tr>
<tr><td>Setaria sphacelata var. torta</td><td>Creeping bristle grass</td><td>Graminoid</td><td>Grassland</td></tr>
<tr><td>Syzgium cordatum</td><td>Water berry</td><td>Tree</td><td>Wetland/riverine</td></tr>
<tr><td>mTecomaria capensis</td><td>Cape-honeysuckle</td><td>Shrub</td><td>Anywhere</td></tr>
</table></td><td>C, PM, RE & ECO</td><td>Project completion and On-going</td></tr>
<tr><td>n) In addition, the following species for rehabilitation may be included where the site comes into contact with a wetland or stream, as they are commercially available:
o Eragrostis tef 3kg/ha
o Digitaria eriantha 6kg/ha
o Panicum maximum 4 kg/ha
o Chloris gayana 6kg/ha</td><td>C, PM, RE & ECO</td><td>Project completion and On-going</td></tr>
</table>

	○ *Cynodon dactylon* 6kg/ha		
	o) The Contractor is to water and maintain all planted vegetation until the end of the defect's liability period and is to submit a method statement regarding this to the PM, RE & ECO.	C, PM, RE & ECO	Project completion and On-going
	p) All rehabilitated areas must be maintained through weekly inspections until at least 85% ground cover success rate has been achieved.	C, PM, RE & ECO	Project completion and On-going
	q) All disturbed soils must be rehabilitated with local plant species to ensure that alien vegetation does not invade the area. Indigenous species must be used for replanting.	C, PM, RE & ECO	Project completion and On-going
D5 – General Maintenance, remediation & Reinstatement	**D5 – General Maintenance, remediation & Reinstatement**		
	a) The extent of the damage must be minimised, and the Contractor must repair any damage that the construction works has caused to adjacent areas.	C, PM, RE & ECO	Project completion
	b) Areas that are to be utilised by heavy machinery, etc. must be clearly demarcated	C, PM, RE & ECO	Project completion
	c) On completion of construction activities, a post construction phase audit must be conducted to ensure the rehabilitation efforts have been implemented. This audit must be conducted one month after construction and rehabilitation work has been completed.	C, PM, RE & ECO	Project completion
	d) A meeting is to be held on site between the Municipality, Engineer, ECO, and the Contractor to approve all remediation activities and to ensure that the site has been restored to a condition approved by the Municipality, Engineer, Project Manager and ECO.	C, PM, RE & ECO	Project completion
	e) The first post construction inspection must be conducted upon hand-over, and must be conducted jointly by the project manager, environmental control officer and engineers responsible for design.	C, PM, RE & ECO	Project completion

7. DECOMISSIONING PHASE OF EXISTING BRIDGE / BRIDGE MANAGEMENT CONTROLS

This pertains to all environmental impacts associated with decommissioning and is not limited to the land on which the Project is to be located. It includes the site footprint, the existing stream crossing, all existing infrastructure as well as any other areas affected or disturbed by construction activities. The EMPr (particularly the specifications for decommissioning are relevant for all areas disturbed by construction activities. Furthermore, the EMPr has taken into account all secondary impacts on the local community and the general public.

Management Objectives:

- Ensure that environmental issues are taken into consideration in the decommissioning activities.
- Construction related activity inside No-Go areas is prevented to avoid environmental impacts to such areas and controlled inside the demarcated construction footprint.
- Minimise impact to the environment through the planned and controlled movement of vehicles and equipment on site.
- To minimise the risk of impact to the environment through the safe stockpiling, handling, and disposal of waste concrete structures and stormwater pipes.

Management Outcome:

- Ensure compliance with Section 28 of the NEMA in terms of Duty of Care and Remediation of environmental damage/degradation
- Environmental impact as a result of decommissioning activities is minimised through the development of effective implementation of a Decommissioning Plan.
- No pollution arises on-site and in-stream as a result of decommissioning activities.
- Ensure mitigation and management of potential negative impacts on the receiving environment.
- The management of waste or the Minimum Requirements for the Handling, Classification and Disposal of Waste (Department of Water Affairs and Forestry, 1998) and Farm Feeds, Agricultural Remedies and Stock Remedies Act of 1947 (Act No. 36 of 1947) and National Environmental Management: Waste Act of 2008.

Activity	Impact Management Actions / Mitigation	Responsibility / Monitoring	Frequency / Timing
E1 – Decommissioning Plan	**E1 – Decommissioning Plan**		
	(a) Prior to decommissioning of the structures such as bridges and stormwater pipes, effective and safe disposal requirements must be identified.	Pro, C, PM & RE	During decommissioning
	(b) Any specific requirements to prevent pollution during demolition of infrastructure must be identified prior to the commencement of the demolition activities.	Pro, C, PM & RE	During decommissioning
	(c) All items removed must be carefully transported and neatly placed in the designated lay down area on the site	Pro, C, PM & RE	During decommissioning
	(d) Structures and construction material that can be reused must be identified prior to disposal and ir no reuse options are available it must be disposed of at a suitable licensed facility	Pro, C, PM & RE	During decommissioning
	(e) Methods for reducing and managing waste must be considered	Pro, C, PM & RE	During decommissioning

8. LEGISLATIVE REQUIREMENTS

The provisions of the EMPr are binding on the Contractor and Proponent during the construction contract and operational phase.

National Environmental Management Act, (Act 107 of 1998): Section 28 of NEMA states:

Duty of care and remediation of environmental damage

The National Environmental Management Act (Act 107 of 1998) (NEMA), is South Africa's overarching environmental legislation: Section 28 of NEMA (Act 107 of 1998), in terms of Duty of Care and Remediation of Environmental Degradation states that: *" Every person who causes has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot be reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment"*

NEMA and its regulations entitle environmental authorities to administer a fine not exceeding R10 million- or 10-years imprisonment and/or a fine and imprisonment for a person guilty of an unlawful activity. The Act makes allowance for the rectification of the unlawful activity but may charge up to R2 million administration fees over and above the remediation costs.

Furthermore, NEMA makes provision for damages to be awarded by the courts where loss or damage has occurred as a result of a contravention of certain Environmental Statutes. For example, offences under the National Water Act No. 36 of 1998, the Forests Act and CARA may result in penalties being imposed in terms of NEMA.

Notwithstanding the Companies Act, 2008 (Act No. 71 of 2008), or the Close Corporations Act, 1984 (Act No. 69 of 1984), the directors of a company or members of a close corporation are jointly and severally liable for any negative impact on the environment, whether advertently or inadvertently caused by the company or close corporation which they represent, including damage, degradation or pollution (Section 24N (8) added by Section 5(h) of Act 25 of 2014; Section 24N (8) of Act 62 of 2008).

Importantly, NEMA provides for the liability on conviction of employees, managers, agents and directors for any offences resulting from the failure to take all the reasonable steps that were necessary under the circumstances to prevent the commission of an offence.

Environmental legislation applicable to the formulation of this EMPr includes but is not restricted to the following:

- The Constitution of the Republic of South Africa (Act 108 of 1996), including the Bill of Rights (Chapter 2, Section 24).
- National Environment Management Act (Act 107 of 1998).
- National Environmental Management: Biodiversity Act (Act 10 of 2004).
- National Environmental Management: Waste Act (Act 59 of 2008).

- National Water Act (Act 36 of 1998).
- National Forests Act (Act 84 of 1998).
- Conservation of Agricultural Resources Act (Act 43 of 1983).
- The National Heritage Resources Act (Act 25 of 1999 as amended).
- KwaZulu-Natal Heritage Act (Act 10 of 1997).
- National Monuments Act (Act 28 of 1969).
- Hazardous Substances Act (Act 15 of 1973).
- Occupational Health and safety Act (Act 85 of 1993).
- Integrated Environmental Management.
- KwaZulu-Natal Nature Conservation Ordinance (15 of 1974).
- Provincial and Local Government Ordinances and Bylaws.

Of importance are also all provincial and municipal by-laws and regulations that are not listed here. Statutes are amended periodically, and it is the Applicant's responsibility to identify legislation relevant to the proposed activity.

8.1 The Polluter-Pays Principle

This principle provides for "the costs of remedying pollution, environmental degradation and consequent adverse effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment." The Polluter Pays Principle will be rigorously applied throughout the construction phase of this project.

9. PROJECT RESPONSIBILITIES

Responsibility for the implementation of the EMPr lies with the Applicant who must retain the services of a suitably experienced and independent Environmental Control Officer (ECO) who will advise on and guide the construction processes and activities. The ECO will also be required to audit the project with respect to compliance with all requirements as previously outlined and will report on such compliances/non-compliances to the relevant Authorities as required.

The ECO's responsibilities must include, *inter alia*:

- Secure the protection and rehabilitation of the environment.
- Guide, advise and consult with Engineers on environmental issues during construction.
- Guide, advise and consult any contractors, sub-contractors, and suppliers etc. who will be involved in this project.
- Revise the EMPr as required and inform the relevant parties of the changes. Substantive changes **must be** authorised by the relevant authorities.
- Ensure that the EMPr has been accepted and understood as a contractually binding document on all parties involved with this project.
- Manage the project to ensure that the training and capabilities of the Contractor's site staff are adequate to carry out the designated tasks.

- Educate staff as to the need to refrain from indiscriminate waste disposal and/or pollution of local soil and water resources, ensure that they (the staff) have received the necessary safety training, and are aware of the importance of a "clean-site policy".
- Additionally, staff must be made aware of and receive the necessary environmental training on sensitive environmental areas, i.e. water courses, indigenous vegetation, and fauna in the area.

The responsibilities of the service providers and contractors during the construction phase are to:

- Ensure that all requirements of the Environmental Authorisation (EA), Water Use Licence (WUL), EMPr and specific project details, are communicated to, understood and followed by all persons working on the project who may have an impact on the environment.
- Ensure that a procedure exists for reporting incidents and resolving any problems rapidly.
- Ensure that ALL staff are thoroughly trained in environmental awareness and carry out their duties with a high degree of environmental ethos.

10. COMPLIANCE WITH THE EMPr

10.1 Record keeping

This EMPr, as well as any other required permits must be kept on site and made available for inspection to anyone wishing to know the contents thereof. The ECO must report incidents of non-compliance to the Project Manager and Competent Authority (EDTEA/DWS/DOT) in their audit reports.

Any emergency incidents during the project must be reported to the relevant CA as well as any other interested and/or affected parties.

All environmental incidents (non-compliance with this EMPr) must be recorded as follows:

- Time, date, location and nature of incident; and
- Corrective actions taken by whom and by when.

A complaints register must be kept on site by the Contractor documenting any complaints received during the project. These records must be submitted to the Project Manager and included in the audit reports.

The following information must be noted:

- Time, date and nature of complaint;
- Contact details of Complainant;
- Response to, and investigation undertaken and by whom.

10.2 Monitoring and Compliance

Monitoring and auditing must take place within the scope of the NEMA (Act 107 of 1998): EIA Regulations 2014. An Independent ECO with suitable experience must be appointed for the duration of the construction and rehabilitation phases to oversee the construction activities and ensure compliance with the EMPr.

- An initial pre-construction workshop must be arranged with the Project Manager, Proponent, all Contractors and construction workers involved in the project to ensure familiarity with environmental obligations contained within the EMPr as contractually binding documents on all parties involved;
- Site visits must be conducted by the ECO twice (2) a month for the duration of the project. If requested by the engineer more frequent site visits may be required;
- Site Audits must be conducted once (1) every month by an independent ECO;
- Non-compliance must be documented by the ECO and reported to the Project Manager and Competent Authorities in Audit Reports;
- Emergency incidents during the project must be reported to the Competent Authorities, the ECO as well as any other affected parties;
- Records relating to monitoring and auditing must be kept on site and made available for inspection by the Compliance Unit/Environmental Management Inspectorate of the department of EDTEA, DWS and any other party requested by the EDTEA.
- On completion of any component of the project, a post construction environmental audit report that assesses the success of the rehabilitation must be submitted to the EDTEA, and DWS.

10.3 Non - Compliance

Non-compliance refers to failure to act in accordance with the law or contract. The Proponent, Implementing Agent or Contractor are deemed not to have complied with the EMPr if:

- Within the development footprint, there is evidence of contravention of clauses contained with the EMPr or Contract Documents;
- There are deviations from the environmental conditions and requirements as set out in the EMPr that has or caused environmental impact;
- Environmental damage occurs due to negligence;
- Any unforeseen environmental impact resulting from direct or indirect actions or activities on site that would be considered as a significant impact. Significance will be determined by the Environmental Control Officer (ECO) but will be informed by geographic extent, duration, lasting effects of the impact and extent of remediation to the impact.
- The contractor fails to comply with corrective or other instructions issued by the Proponent, the ECO or Implementing Agent within a specified time frame; and
- The contractor fails to respond adequately to complaints from the public or local community.

The Proponent, Implementing Agent or Contractor (the responsible party) must act immediately after a notice of non-compliance is received, and correct the cause for the issuing of the notice. Application of a penalty clause will apply for incidents of non-compliance. The penalties imposed per incident or violation should be as noted in Table 10.4 below

Table 10.4: Mechanisms for Regulating Non-Compliance

Incident / Violation	Penalty	Administering Authority
Failure to stockpile material in designated areas in the correct manner	R 5, 000.00	ECO / Competent authority
Removed topsoil being stockpiled at a height greater than 2m, and being used for purposes other than rehabilitation/landscaping.	R 2, 500.00	ECO / Competent authority
Failure to manage spoil and topsoil	R 2, 500.00 per day	ECO / Competent authority
Building materials, such as river sand, being sourced without a necessary permit.	R 15, 000.00 Per incident	ECO / Competent authority
Pollution of watercourse[3]	R 25, 000.00	ECO / Competent authority
Failure to control and manage storm water	R 20, 000.00	ECO / Competent authority
Failure to provide adequate sanitation at construction working area and the construction camp	R 15, 000.00	ECO / Competent authority
Unauthorised clearing / removal of vegetation	R 15, 000.00	ECO / Competent authority
Failure to provide adequate waste disposal facilities and services	R 15, 000.00	ECO / Competent authority
Failure to reinstate and rehabilitate disturbed areas, within specified time period	R 15, 000.00	ECO / Competent authority
Failure to comply with recommendations	R 5, 000.00 per day	ECO / Competent authority
Burning of waste on site	R 5, 000.00 per incident	ECO / Competent authority
Chemical and hazardous spills	R25 000.00 per day*	ECO / Competent authority
Starting of indiscriminate fires	R25 000.00 per incident per day including costs associated with fire damage/destruction to homes, businesses etc	ECO / Competent authority
Failure to minimise the effects of erosion (on-going)	R 5, 000.00 per incident per day	ECO / Competent authority
Sourcing of water for construction purposes without necessary permit authorisation by DWS	R 15, 000.00	ECO / Competent authority
Failure to protect sensitive areas	R 5, 000.00 per day	ECO / Competent authority

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

Incident / Violation	Penalty	Administering Authority
Failure to ensure that the construction site is left devoid of pollution, erosion and unwanted/ surplus material	R 50, 000.00	ECO / Competent authority
Failure to allow for rehabilitation of wetland and buffer areas	R 80, 000.00	ECO / Competent authority
Failure to obtain necessary permits for the removal of indigenous vegetation that is endangered or which is protected under National statute	R 15, 000.00	ECO / Competent authority
Drainage channels, wetlands, trees/bush being used for urination/washing purposes	R 5, 000.00	ECO / Competent authority
Failure to comply with findings and recommendation of all specialist reports	R 15, 000.00	ECO / Competent authority

The Project Manager / ECO will inform the Contractor of the contravention when it occurs, and applicable fines / penalties must be deducted from the next certificated payment if the non-compliance is not remedied within 14 working days.

* The penalty (as indicated in the table above) associated with a chemical spill is a minimum amount payable. The full amount payable will depend on the nature and extent of the spill. In addition to the above stipulated penalty and any additional amount that may be levied, the Contractor will need to pay for the cost of any soil and /or groundwater monitoring and any soil and / or groundwater remediation required by authorities.

The imposition of such a penalty does not preclude the relevant competent authority from applying an additional penalty in accordance with statutory powers.

Failure to redress the cause must be reported to the relevant authority for them to deal with the transgression, as deemed fit.

11. AMENDMENTS TO THE EMPR

Any amendments to the EMPr must be in accordance with Regulation 32 of EIA regulations 2014. Any amendments will require approval from EDTEA and/or DWS. A confirmation letter from the relevant Competent Authority (CA) approving the amendments to the EMPr must be attached as addenda.

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APPENDIX A: ENVIRONMENTAL AWARENESS

The Proponent must ensure that adequate inductions and training are conducted prior to the Proposed Emergency repair work at the D1834 Bridge near Jozini. The aim of Environmental Awareness Training is to provide construction workers with the knowledge to identify environmental issues associated with their activities and best practice methods to minimise environmental impact. It is also to outline environmental legal obligations relevant to construction activities.

The plan provides the following:

Objectives of the Environmental Awareness Training
The objectives of this Environmental Awareness Training are to inform staff, workers and contractors of any environmental risks that may result from their work and indicate how they should deal with such risks should they materialise.

Why we need an environmental awareness training? EA, EMPr and WUL/GA contains various measures to protect the environment. Legally, KZNDOT must make workers and contractors aware of the commitments made in these documents in order for all parties to work towards fulfilling these obligations and thus protecting the natural environment.

Environmental Management Programme (EMPr)

- The EMP is site specific;
- It is a legal document;
- Auditing is practiced using the EMPr;
- All staff must be familiar with the contents of the EMPr.

Environmental File

The need to establish an environmental file is to keep all these legal documents (EMPr, Permit) in the construction site so this can be made available to any officials from the Departments (EDTEA / DWS) and any other I&APs upon request.

A record of all the other important documents must be added to the environmental file at all times as the project progresses – such as an updated works programme; weigh bills; effluent disposal certificates, written record of all taking of surface water, complaints register, etc.

Definition of environment:

- The environment can be separated into the natural and built environment. The natural environment includes the air, water, soil, plants, animals and people;
- The built environment in this instance includes construction camp site, the surrounding houses, roads, equipment, machinery and vehicles; and
- Protecting the natural environment, we are in and in which we interact, forms the basis of environmental management.

We need to protect the natural environment for the following reasons:

- It provides us with food, water and air to breathe;
- It is our obligation to ensure a healthy environment;
- The next generation has a right to a healthy environment; and
- The laws demand that we protect the environment.

If we fail to protect the natural environment:

- KZN DoT may be subjected to a fine;
- The contractors or the construction workers not complying, may be subject to a fine;
- Individuals may be removed from site; and
- Construction may be stopped.

To protect our natural environment, we must:

- Report all incidents to a superior or Resident Engineer;
- Work together as a team; and
- Follow rules and management measures discussed below.

Working area management

- Workers and equipment must stay within demarcated working areas of the site boundaries at all times; and
- If these rules are not obeyed, unnecessary damage may be done to the natural environment and disciplinary action may be taken. For example - destroying/damaging protected plant species; polluting rivers or wetlands; littering (placing refuse and discarded construction materials in skips/bins)

Wetlands and Drainage Lines

- At all times prevent watercourse pollution by making sure that there is no spillage of oil, petrol, diesel, concrete or allowing rubbish to lie around;
- Do not work in the wetland without direct instruction; and
- No stockpiling of any materials may take place adjacent to or in the wetlands.

All incidents must be reported

- Any problems such as water leaks, oil spilled, waste leaked must be reported to the Project Manager and the ECO; and must be cleaned up IMMEDIATELY.
- Always report incidents with date, time, location and brief descriptions.

Animals and Vegetation

- Any animals on site must not be harmed or killed but rather should be removed safely when found.
- Ask your supervisor or Contract's Manager to remove animals found on site; and
- Similarly, no trees, shrubs, aloes or other vegetation may be removed without permission.

Smoking and Fire

- Put cigarette butts and matches in a rubbish bin provided;
- Do not smoke near gas, paints or petrol;
- Do not light any fires without permission;
- Know the positions of firefighting equipment;
- Report all fires; and
- Do not burn rubbish or vegetation on site.

Petrol, oil and diesel

- Only work with petrol, oil and diesel in marked areas;
- Report any petrol, oil and diesel leaks or spills to your supervisor;
- Use a drip tray under vehicles and machinery; and
- Empty drip trays after rain; this liquid may only be thrown away into a special drum that must be stored under special conditions.

Dust

- Avoid or minimise producing dust;
- Dust can be suppressed by watering of site to make ground and soil wet;
- Dust cause causes irritation to lungs and eyes and reduces;
- Visibility which can be dangerous to drivers and pedestrians.

Toilets

- Use the toilets provided - 1:7 ratio;
- Report full or leaking toilets;
- All toilets must be kept in clean at all times;
- A registered chemical waste company must remove waste from the chemical toilets on a weekly basis, or more regularly; and
- All documentation for the waste collection must be kept by the Contractor for recording by the ECO.

Archaeological material

- If any archaeological or paleontological material are found for example artefacts and fossils during construction works, the Contractor must stop work immediately and inform the PM and ECO;
- The PM shall inform the responsible heritage resources authority and arrange for an archaeologist to inspect, and if necessary, excavate the material subject to acquiring the requisite permits; and
- The Contractor shall not recommence working in that area until he has received written permission from the PM.

Eating

- Only eat in demarcated eating areas;
- Do not litter; and
- Put packaging and leftover food into rubbish bins that must be covered at all times.

Rubbish

- Do not litter – Put all rubbish (especially cement bags) into the bins/skips provided;
- All bins must be covered with lids at all times;
- Report full bins to your supervisor;
- The responsible person should empty bins regularly;
- All solid waste shall be disposed of at an approved and licensed landfill site. The Contractor must ensure that weigh bills disposal certificates are kept in the Environmental File for recording by the ECO and
- All hazardous waste shall be disposed of at a licensed hazardous waste disposal site. Hazardous waste disposal is to be properly documented. The Contractor must ensure that weigh bills disposal certificates are kept in the Environmental File for recording by the ECO.

Trucks and driving

- Always keep to the speed limit;
- Drivers - Check and report leaks and vehicles that belch smoke; and
- Ensure loads are secure and do not spill.

Emergency phone numbers

All emergency numbers such as Ambulance, Fire, Police, Snake Emergency must be displayed on the outside of the construction office at all times.

Complaint register

The need for a complaint book is that all community and other I&APs must be treated with respect and must be sent to a supervisor or the Contractor to have their concern/queries addressed. Complaints must be efficiently dealt with.

Section 28 of NEMA states: '*Every person who causes has caused or may cause significant pollution or degradation of the natural environment must take reasonable measures to prevent such pollution or degradation from occurring or continuing."*

Please note failure to comply with the conditions as stipulated in the EA and approved EMPr result in the revoking of the EA. Non-compliance with the GA, the Section 21(a), (c) and (i) water uses will be regarded as unlawful. In addition, this constitutes an offence and such an offence, on first conviction, is liable to a fine not exceeding R 10 million or imprisonment for a period not exceeding 5 /10 years or both.

Especially the fact that it is not just "the boss" who can get into trouble but also the worker who actually causes the problem The Contractor (the responsible party) must act immediately after a notice of non-compliance is received, and correct the cause for the issuing of the notice. Application of a penalty clause will apply for incidents of non-compliance.

APPENDIX B: ALIEN VEGETATION PLANT CONTROL

INTRODUCTION

Invasive alien plants (IAPs) are plant species that have been introduced, to South Africa, either intentionally or unintentionally. They can reproduce rapidly in their new environments and out-compete indigenous plants for both nutrients and water thereby destroying whole eco-systems. They are usually "water-hungry" plants/shrubs/trees resulting in a much higher use of valuable ground water and ecological devastation.

LEGISLATIVE AND POLICY FRAMEWORK GOVERNING IAP CONTROL

National Environmental Management: Biodiversity Act No. 10 of 2004 (NEMBA)

The National Environmental Management: Biodiversity Act (NEMBA) 2004 (Act No. 10 OF 2004) regulates all invasive organisms in South Africa, including a wide range of fauna and flora. Regulations published in Government Notice (GNR) R864 dated 29 July 2016; Listing Notices 1 - 4 which must be read with GNR 598 & 599 of August 2014 under NEMBA. These notices list Categories 1a, 1b, 2 and 3, Listed Invasive Species, in terms of which certain Restricted Activities are prohibited in terms of section 71A(1); exempted in terms of section 71(3); require a Permit in terms of section 71(1); Plants listed under categories 1a & 1B must be eradicated.

Conservation of Agricultural Resources Act No. 43 of 1983 (CARA)

Regulation 15 of CARA regulates and restricts the propagation, harbouring and sale of invasive alien plat and weed species listed in a set of Regulations publish in terms of the Act. All listed Invasive Alien Plants are divided into three categories which are:
Category 1 – Prohibited Plants
Category 2 – Invader plants with commercial or utility value
Category 3 – Primarily ornamental or 'exotic' horticultural plants

Please Note: This Invasive Alien Plant Programme does not cover aquatic IAPs as control of these needs specialised input, equipment and herbicide.

Benefits of control

- Reduction of spread of alien plant species into non-affected areas;
- Improvement of water quality and quantity;

- Legal compliance (landowners are required to eradicate, or control declared weed and alien invader plants in terms of the Conservation of Agricultural Resources Act 43 of 1983 and National Environmental Management: Biodiversity Act 2004 (Act No. 10 of 2004) as amended from time to time).
- Improvement of biodiversity in and around the construction area.
- Reduction in soil erosion. Certain species of alien invader plants reduce soil cover, leading to increased erosion.

Important factors influencing the effectiveness of a control programme

- Timeous implementation of control operations is important as alien plants are more susceptible to herbicides when they are young and lower herbicide rates can be used.
- Appropriate herbicides must be chosen. Selective broadleaf herbicides must be chosen where it is the intention to achieve rapid colonisation of the site by grasses. Care must be taken when applying herbicides and label prescriptions must be strictly adhered to. The Environmental Control Officer (ECO) to advise.
- Operations must be directed towards eradicating alien vegetation.
- A reputable company must be hired to undertake herbicide application. The ECO must be available to monitor/supervise this activity.

Requirements for an effective alien vegetation control programme

- Identify the problem: extent, location and species of problem plants.
- Identify any sensitive ecosystems, rare or endangered plants etc. which may be affected by a control programme. Identify the original ecosystem applicable to the area. The method of control will be influenced by the type of vegetation to which the area must revert.
- Identify an appropriate control method: mechanical or chemical, type of herbicide, application etc. (Mechanical and biological methods are preferred, compared to chemical methods)
- Make provision for a number of follow up operations. The initial clearing operation is only part of the total programme. Failure to follow up will result in a failure of the entire programme.

INVASIVE ALIEN PLANT CONTROL METHODS

Control Methods	Description
Mechanical Methods	
Hand pulling / Hoeing	• Hand pulling is most effective with small (300 mm), immature or shallow rooted plants such as blackjack, tall khaki weed, *Chromolaena odorata* etc. • Shake the excess sandy material from the plant, this makes the plant easier to stockpile and lighter to transport. • However, make sure there is no seed on the plant first to prevent the spread of seeds while shaking. If seeds are present, they need to be cut off and bagged. • When piling the removed plants either place on a plastic sheet or placed into a plastic bag to prevent seed spreading – do NOT leave it lying around.
Chopping / Cutting / Slashing	• This method is most effective for plants in the immature stage, or for plants that have relatively woody stems/ trunks, or larger root systems such as Lantana, American bramble, Bug weed, Castor Oil Bush must be done in conjunction with chemical treatment of the cut stumps (application by painting the herbicide onto stumps cut approximately 100mm above the ground). Note • Cut/slash the stem of the plant at approximately 100 mm to ground level. • Paint all cut plants with an appropriate herbicide immediately after they have been cut. • Stockpile removed material into piles after removing seeds or pods collect all the seeds from the ground. All seeds must be put in a plastic bag that is tightly sealed. The seeds must be disposed of at the nearest garden refuse site. • Cut stems can be used as firewood; however, poisonous plants must not be burned i.e. castor oil bush, oleanders and parthenium.
Ring Barking	• Remove bark in a 300-400 mm band ensuring that all bark, phloem and cambium tissue is removed within the band and paint herbicide immediately to exposed band.
Felling This may only occur on instruction and guidance from the ECO.	• De-branch trees and remove all material. Branches can be chopped to small blocks and used as firewood (provided that they are not poisonous) • Cut the tree down to approximately 150 mm from ground level. • Dissect the stump as much as possible to increase the surface area for the effective application of herbicide. Apply the herbicide by painting it on the stump immediately (no later than 30 mins) to the dissected stump.

	• Branches can be used as erosion logs for stormwater bio-engineering control measures. See photograph below. 
Chemical Control Method	
• Chemical control of alien plants must not be done in aquatic systems. • Plenum and Kaput Gel (trade names), Trichlon, stump paint is recommended for this project, the ECO will advise if other herbicides are needed. • No application of herbicide is to be carried out during wet or windy conditions. • The spraying of herbicides is STRICTLY prohibited.	
Cut Stump Application This is the preferred chemical control method.	• This is a highly effective and appropriate control method for woody vegetation or larger specimens of alien invasive vegetation. • The appropriate herbicide (after it has been mixed or diluted as per its instructions) must be applied to the stump using a paintbrush within 30 min of being cut. • Stems must be cut to approximately 150mm close to ground level. Dissect the stump as much as possible to increase the surface area for the effective application of herbicide.
Scrape and Paint This is an acceptable chemical control method.	• This method is suitable for large vines and scrambling plants i.e. creepers such as balloon vines; Ipomoea spp and Pereskia. • Starting from the base of the stem, scrape 20-100cm of the stem to expose the sapwood just below the bark. • Immediately apply the herbicide to the scraped section. • Leave the vines to die in place. Do not try and pull them down off the tree/shrub on which they are growing.
Droplet Application	• Droplet application deposits herbicides directly where it is needed / wanted. • A small amount of herbicide is used per plant. • This is a good application for regrowth onto your leaves below knee height.
Disposal Methods	

Landfill Site	• If alien plant vegetation is to be disposed of at a landfill site, seeds are to be placed in sealed plastic bags to minimise contamination of the environment.
Stacking (Do not stack for more than a week, the ECO will advise)	• Stack light branches separately from heavy timber (75mm and more). Remove heavy branches to reduce long burning fuel loads that can result in soil damage from an intensely hot fire. • Do not make stacks under trees, power and telephone lines, within 30 meters of a fire belt or near watercourses, houses and other infrastructure. • The local municipality must be informed of the alien vegetation burning exercise prior to implementation. Burning must not take place during windy conditions and/or after 3 pm, • Firefighting equipment must be available at all times during this exercise. • Cut material may be donated to community members, provided that all seeds have been removed from the branches so as to prevent dispersal of IAP.

Species Name	Common Name	Mechanical Method	Chemical Method	Herbicide
Ageratum conyzoides	Invading ageratum 	Hand Pull	Droplet spray	Plenum (as tri-isopropanolamine salt)
Bidens bipinnata	Spanish blackjack 	Hand Pull	Droplet spray	Plenum (as tri-isopropanolamine salt)
Chromolaena odorata	Paraffin weed 	Hand pull	Slash large plants apply herbicide by droplet spray	Plenum
Eucalyptus grandis	Saligna gum 	Ring barking or felling	Paint cut stump or ring barked area	Kaput Gel (pyridine carboxylic acid-as potassium salt)

Species Name	Common Name	Mechanical Method	Chemical Method	Herbicide
Galinsoga parviflora	Small-flowered Quickweed 	Slashing / Chopping / Cutting	Droplet	Plenum (as tri-isopropanolamine salt)
Ipomoea purpurea	Common Morning Glory 	Hand Pull	Droplet	Plenum (as tri-isopropanolamine salt)
Lantana camara	Common Lantana 	Slashing / Chopping / Cutting	Droplet	Kaput gel (large stems) Plenum (small plants)
Melia azedarach	Syringa 	Hand Pull (Seedling)	-	No herbicide needed
		Felling and paint stumps (Adult)	Use paint brush	Kaput Gel (pyridine carboxylic acid-as potassium salt)
Nephrolepis exaltat	Sword fern 	Slashing / Chopping / Cutting	Droplet /applied to young regrowth	Plenum (as tri-isopropanolamine salt)

Species Name	Common Name	Mechanical Method	Chemical Method	Herbicide
Pennisetum clandestinum	Kikuyu grass 	Hoeing	Spraying	Triclopyr
Sphagneticola trilobata	Singapore daisy 	Slashing	Droplet spray to regrowth	Plenum (as tri-isopropanolamine salt)
Solanum mauritianum[4]	Bugweed 	Slashing / Chopping / Cutting	Droplet	Plenum (as tri-isopropanolamine salt)
			Stump paint / Droplet	Kaput Gel (pyridine carboxylic acid-as potassium salt)
Tithonia diversifolia	Mexican sunflower 	Slash cut	Droplet stump paint	Plenum

Please note: Other alien vegetation species may be found on or near the project site and appropriate control measures must be implemented to eradicate that particular species. The ECO is to advise.

[4] When removing *Solanum mauritianum* (Bugweed) workers must wear protective clothing, gloves and facemasks to prevent skin irritation by and inhalation of the fine hairs that cover this plant.

APPENDIX C: SPILL RESPONSE PLAN

INTRODUCTION

The purpose of this Spill Response Plan (SRP) is to develop and highlight the appropriate procedures to follow in the event of a spill to minimise the potential to harm either employees or the environment.

In the event of a spill occurring on the site, this SRP provides a guideline to the process that must be undertaken to ensure that the spill is contained in a manner which is safe for the employees on site and prevents harm to the surrounding environment.

1. CLEAN-UP PROCEDURES

Spilled chemicals must be effectively and quickly contained and cleaned up. Employees may only clean up spills themselves if properly trained and protected. Employees who are not trained in spill clean-up procedures must report the spill to the relevant emergency staff, warn other employees, and leave the area.

The following general guidelines must be followed for evacuation, spill control, notification of ECO & proper authorities, and general emergency procedures in the event of an incident in which there is potential for a significant release of hazardous materials.

1.1 Evacuation

Persons in the immediate vicinity of a spill must immediately evacuate the premises (except for employees with training in spill response). If the spill is of "medium" or "large" size, or if the spill is deemed hazardous, immediately notify emergency response personnel. A spill response team must be created for the project. This spill response team must be trained on hazardous chemical substances, handling of hazardous chemical substances as well as how to perform clean-ups. The spill response team must only be used to "small" spills and "medium" and "large" spills must be handled by a reputable spill response company, i.e. "Drizit".

1.2 Spill Control Techniques

NOTE: Treat all residual chemical and clean-up materials as hazardous waste.

Spill control equipment must be located wherever significant quantities of hazardous materials are received or stored. MSDSs, absorbents, over-pack containers, container patch kits, spill dams, shovels, floor dry, acid/base neutralizers, sealable containers to receive the contaminated spill material and "caution-keep out" signs are common spill response items that must be present.

Spill Response and Clean-up

All spill incidents must be reported to the ECO immediately.

Chemical spills are divided into three categories: Small, Medium and Large. Response and clean-up procedures vary depending on the size of and the type of spill.

Chemical spills include the spilling of COLAS. COLAS can specifically be absorbed/contained using sand and spill control material. Once contained/absorbed, wait for the product to cool **and solidify. It must then be shovelled into a container for disposal at a registered landfill site.**

***Small Spills*:**

Definition: Any spill where the major dimension is less than 50cm in diameter.

Small spills are generally handled by internal personnel and usually do not require an emergency response by police or fire department teams.

- Quickly control the spill by stopping or securing the spill source. This could be as simple as up-righting a container and using floor-dry or absorbent pads to soak up spilled material. Wear gloves and protective clothing, if necessary.

- Put spill material and absorbents in secure containers.
- Consult with the Operational Health and Safety (H&S) representative and the MSDS for spill and waste disposal procedures.
- In some instances, the area of the spill must not be washed with water. Use Dry Clean-up Methods and never wash spills into the natural environment.
- Both the spilled material and any absorbent may be considered hazardous waste and must be disposed of in compliance with municipal, provincial and national regulations.

***Medium Spills*:**

Definition: Spills where the major dimension exceeds 50cm but is less than 2m.

Outside emergency response personnel (police and fire department teams) must usually be called for medium spills. Common sense, however, will dictate when it is necessary to call them.

- Immediately try to contain the spill at its source by simple measures only. This means quickly up righting a container, or putting a lid on a container, if possible. Use absorbent material. Once you have made a quick attempt to contain the spill, or once you have quickly determined you cannot take any brief containment measures, leave the area and alert emergency response personnel (police and fire department teams). Give personnel accurate information as to the location, chemical, and estimated amount of the spill.
- Evaluate the area outside the spill. Engines and electrical equipment near the spill area must be turned off and if necessary, electricity must be cut. This eliminates various sources of ignition in the area. Do not go back into the spill area once you have left.
- Help emergency response personnel by advising as to how to turn off engines or electrical sources.
- If emergency responders evacuate the spill area, follow their instructions in leaving the area.
- After emergency response personnel have contained the spill, be prepared to assist them with any other information that may be necessary, such as MSDSs and questions about the facility. Emergency response personnel or trained personnel with proper personal protective equipment will then clean up the spill residue. Do not re-enter the area until the emergency response personnel in charge gives the all clear. Be prepared to assist these persons from outside the spill area with MSDS, absorbents, and containers.
- Reports must be filed with proper authorities. It is the responsibility of the contractor to inform the emergency response personnel as to what caused the spill. The response for large spills is similar to the procedures for medium spills, except that the exposure to danger is greater.

***Large Spills*:**

Definition: Any spill involving flammable liquid where the major dimension exceeds 2m in diameter; and any "running" spill, where the source of the spill has not been contained or flow has not been stopped.

- Leave the area and notify emergency response personnel. Give the operator the spill location, chemical spilled, and approximate amount.
- From a safe area, attempt to get MSDS information for the spilled chemical for the emergency response personnel to use. Also, be prepared to advise emergency response personnel as to any ignition sources, engines, electrical power, or air conditioning/ventilation systems that may need to be shut off. Advise emergency response personnel of any absorbents, containers, or spill control equipment that may be available. This may need to be done from a point some distance from the spill site.
- Only emergency response personnel, in accordance with their own established procedures, may handle spills greater than 2m in any dimension or that are continuous. Remember, once the emergency response personnel are on the job cleaning up spills or putting out fires, the area is under their control and no one may re-enter the area until the emergency response personnel in charge gives the all clear.
- Provide information for reports to supervisors and emergency response personnel, just as in medium spills.

Reporting spills

All chemical spills, regardless of size, must be reported as soon as possible to the appropriate official/department, who should be in a position to determine whether the spill has the potential to affect the environment outside of the facility. If required, either the spill response team or a spill company must be contacted.

Examples of spills that could affect the outside environment include spills that are accompanied by fire or explosion and spills that could reach nearby water bodies.

In the event of a significant spillage that cannot be contained, and which poses a serious threat to the local environment, the following departments must be informed within 6 (six) hours of the incident and in accordance with the Section 30 of the National Environmental Management Act, Act 107 of 1998:

- The Local Municipality - Municipal Manager (**Umhlabuyalingana** Local Municipality)
- Department of Water and Sanitation
- Provincial Department of Economic Development, Tourism & Environmental Affairs
- The Local Fire Department
- Municipal Disaster Management Team
- ECO and Engineer

REVIEW AND RE-STOCK

Following a spill of any material on site, the Health and Safety Officer must complete an incident report; this report shall be completed within (1) week of the event and detail the following:

1. Cause of spill
2. Identify whether the cause of the spill is a procedural error which must be changed
3. Effectiveness of clean up procedures
4. Were the clean-up tools/materials returned to the area or if necessary, replaced

The Health and Safety Officer must undertake a general review of this SRP every six months. This review shall ensure that this SRP is updated should any new materials be stored on site. The review will also ensure that the spill response procedure remains effective and updated.

STAFF TRAINING

The Health and Safety Officer shall ensure that any new staff that are employed on site are familiar with this SRP and the storage location of all oils/fuels and containment equipment.

APPENDIX D: HYDROSEEDING

DEFINITION:

1. DEFINITION

Hydroseeding is a process of applying a mixture of water, seed, fertilizer and mulch to soil surfaces/scarified embankments by means of direct spraying using hydromulch equipment. The mixture temporarily protects soils from water and wind erosion, allowing seeding to take root. Hydroseeding is also referred to as hydraulic seeding, hydra-seeding or hydro-mulching.

2. USE

Hydroseeding is applied on disturbed soil areas requiring temporary protection until permanent vegetation is established on disturbed areas. Hydroseeding can be used for veld reclamation, turf seeding and erosion, sediment and dust control. Hydroseeding can cover large and inaccessible areas within a short space of time.

3. PROCESS

The seeding process involves the use of highly specialised equipment, including four-wheel drive vehicles that can access almost any type of terrain. The slurry is transported in a Hydroseeding unit, either truck or trailer-mounted and sprayed over prepared soil surfaces in even layers. Powerful pumps and extension hoses generate a spray range in excess of 100 meters. In general, Hydroseeding is a dry land rehabilitation method, which does not require any form of additional irrigation. The use of scarifying drills, soil binder and mulch will retain the *in-situ* application slurry, binding the surface layer. A micro-climate form as the climate and soil moisture conditions for germination improves, and vegetation establishes.

4. BENEFITS

- **Time and cost effective**

The mixture used for the Hydroseeding process is relatively cheaper than traditional broadcast seeding and sodding. When the process is carried out correctly, Hydroseeding is time efficient as large and/or inaccessible areas of land can be covered within short spaces of time. An area of up to four hectares can be completed per Hydroseeding unit in a single day. This results in a high production rate, particularly where dust pollution and erosion control is of concern. As germination occurs rapidly, maintenance is nominal.

- **Faster effects**

As a site-specific hydro-mulch mixture is used, Hydroseeding vegetation generally germinates quicker than comparative broadcast seeding and sodding. Early growth is usually visible within five to six days. Suitable grass cover can be established within two to three months.

- **Limitation of stress caused by varying surface temperatures due to depth of seedbed**

This also ensures successful germination of seedlings. This also limits the loss of seed and material by wind and water erosion.

- **Erosion control**

Hydroseeding offers built in erosion control. Erosion issues are often addressed by simple application of the Hydroseeding mixture, as the mulch and slurry harden, erosion issues are contained until seed establishes itself and becomes a permanent erosion inhabitant.

APPENDIX F: COVID-19 MANAGEMENT

The Main Contractor and Sub-Contractors appointed to undertake the construction activities must have a COVID-19 Management Plan in place prior to construction commencing. All employees entering the site, including visitors must adhere to the COVID-19 Management Plan implemented for site.

The COVID-19 management plan must include the following documents and information:

- Communication Register – this register must be completed by each person entering the site. Each person is required to complete their name and surname and sign this register;
- Daily Screening - a daily screening form must be available for each person to complete when entering and exiting site. This screening form must include the person's name and surname, body temperature reading (done when arriving to site and when exiting site), as well as a section which allows for symptoms to be chosen if any are experienced by the employee;
- Employee Assessment Form – Each person entering site must complete the assessment form which provides questions relating to the COVID-19 Pandemic, asks whether employees are showing any symptoms (which are listed) and prevention methods and information. This form is to be completed daily by each person entering site;
- Occupational Health and Safety Toolkit - this tool kit outline the preparation of site, who the COVID-19 Management Plan is implemented on site, communication methods used on site regarding COVID-19 information and how to maintain a healthy environment;
- PPE Policy – the contract and sub-contractors must have a PPE policy and have all the PPE required available to their employees every day;
- PPE Issue Record – record must be kept of the PPE being issued to employees, this record must include the type of PPE issued and on what date. The employee must sign for each item of PPE issued;
- COVID-19 Site Rules – Site rules must be available an implemented prior to the commencement of the construction activities. These site rules must be communicated to all employees on site prior to work activities commencing and regularly as a reminder;
- Site Visitors Form – All visitors visiting site must complete a form on arrival which include questions relating to COVID-19 and information included but not limited to whether they are experiencing any symptoms and whether they have been in contact with confirmed COVID-19;
- Awareness Talk – A toolbox talk must be done on a regular basis which informs employees of COVID-19 and general information such as Symptoms, Prevention, Site Specific Protocol, Travel Protocol and what to do if you become sick and or experience symptoms;
- COVID-19 Compliance Officer – Each Contractor and Sub-Contractor must appoint a COVID-19 Compliance Officer. There must be a COVID-19 Compliance Officer appointed on each shift if shift work is applicable

APPENDIX G: CHANCE FINDINGS PROTOCOL

This Protocol will ONLY kick-in if palaeontological material is found. In the case of any unusual structures, the Palaeontologist must be notified immediately by the ECO and/or EAP, and a site visit must be arranged at the earliest possible time with the Palaeontologist.

In the case of the ECO or the Site Manager becoming aware of suspicious looking palaeomaterial during construction activities, the following procedures must be actioned:

- The construction must be halted in that specific area and the Palaeontologist must be given enough time to reach the site and remove the material before excavation continues.
- Mitigation will involve the attempt to capture all rare fossils and systematic collection of all fossils discovered. This will take place in conjunction with descriptive, diagrammatic and photographic recording of exposures, also involving sediment samples and samples of both representative and unusual sedimentary or biogenic features. The fossils and contextual samples will be processed (sorted, sub-sampled, labelled, and boxed) and documentation consolidated, to create an archive collection from the excavated sites for future researchers.

Functional responsibilities of the KwaZulu-Natal Department of Transport post-discovery of palaeomaterial are detailed below:

- Appointed a reputable, experienced and appropriately qualified and registered Palaeontologist to ensure that a representative archive of palaeontological samples and other records is assembled to characterize the palaeontological occurrences affected by the excavation operation.
- Provide field aid, if necessary, in the supply of materials, labour and machinery to excavate, load and transport sampled material from the excavation areas to the sorting areas, removal of overburden if necessary, and the return of discarded material to the disposal areas.
- Facilitate systematic recording of the stratigraphic and palaeo-environmental features in exposures in the fossil-bearing excavations, by described and measured geological sections, and by providing aid in the surveying of positions where significant fossils are found.
- Provide safe storage for fossil material found routinely during excavation operations by construction personnel. In this context, isolated fossil finds in disturbed material qualify as “normal” fossil finds.
- Provide covered, dry storage for samples and facilities for a work area for sorting, labelling and boxing/bagging samples.
- Costs of basic curation and storage in the sample archive at the Museum in Durban (labels, boxes, shelving and, if necessary, specifically tasked temporary employees) as specified by or agreed with AMAFA. Documentary record of palaeontological occurrences
- The contractor will in collaboration with the Palaeontologist, make the excavation plan available to the appointed specialist, in which appropriate information regarding plans for excavations and work schedules must be indicated on the plan of the excavation sites. This must be done in conjunction with the appointed specialist:
- Initially, all known specific palaeontological information will be indicated on the plan. This will be updated throughout the excavation period
- Locations of samples and measured sections are to be pegged, and routinely accurately surveyed. Sample locations, measured sections, etc., must be recorded three-dimensionally if any “significant fossils” are recorded during the time of excavation. Functional responsibilities of the appointed palaeontologist
- Establishment of a representative collection of fossils and a contextual archive of appropriately documented and sampled palaeoenvironmental and sedimentological geodata at the Museum in Durban.
- Undertake an initial evaluation of potentially affected areas and of available exposures in excavations.
- On the basis of the above, and evaluation during the early stages of excavation development, in collaboration with the contractor management team, more detailed practical strategies to deal with the fossils encountered routinely during excavation, as well as the strategies for major finds.

- Informal on-site training in responses applicable to “normal” fossil finds must be provided for the ECO and environmental staff by the appointed specialist.
- Transport of material from the site to the Museum in Durban.
- Reporting on the significance of discoveries, as far as can be preliminarily ascertained. This report is in the public domain and copies of the report must be deposited at ESI, AMAFA, and the South African Heritage Resources Authority (SAHRA). It must fulfill the reporting standards and data requirements of these bodies.
- Reasonable participation in publicity and public involvement associated with palaeontological discoveries. In the event of construction exposing new palaeontological material, not regarded as normative/routine as outlined in the initial investigation, such as a major fossil plant find, the following procedure must be adhered to:
- The appointed specialist or alternates (AMAFA, SAHRA; University) must be notified by the responsible officer (e.g. the ECO or contractor manager), of major or unusual discoveries during excavation, found by the Contractor Staff.
- Should a major in situ occurrence be exposed, excavation will immediately cease in that area so that the discovery is not disturbed or altered in any way until the appointed specialist from the ESI at WITS University, or its designated representatives at AMAFA, have had reasonable opportunity to investigate the find. Such work will be at the expense of the Developer.

APPENDIX F: ACKNOWLEDGEMENT FORM

THE PROPOSED THE BALAMHLANGA RIVER BRIDGE 3505 WITHIN THE UMHLABUYALINGANA LOCAL MUNICIPALITY

Record of signatures providing acknowledgment of being aware of, and committed to complying with the contents of this Environmental Management Programme (EMPr), which relates to the environmental mitigation measures for the project outlined above, and the environmental conditions contained in the contract documents as well as all relevant conditions as stipulated in the Environmental Authorisation as issued by the KZN EDTEA

ENTITY	NAME & SURNAME	DATE SIGNED	SIGNATURE
PROPONENT			
PROJECT MANAGER			
ENGINEER			
ENVIRONMENTAL CONTROL OFFICER			
CONTRACTOR			
CONTRACTOR			
CONTRACTOR			
CONTRACTOR			