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**Geotechnical, Environmental
& Earth Science Consultants**

**ENVIRONMENTAL MANAGEMENT PROGRAMME
PROPOSED UPGRADING OF GRAVEL DISTRICT ROADS
D1841, D1842 AND D1884 (FROM KM 0.0 TO KM 32.10),
JOZINI LOCAL MUNICIPALITY, KWAZULU-NATAL.**

EDTEA REF. NO.: DC27/0004/2017

June 2017

Draft

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ENVIRONMENTAL MANAGEMENT PROGRAMME

PROPOSED UPGRADING OF GRAVEL DISTRICT ROADS D1841, D1842 AND D1884 (FROM KM 0.0 TO KM 32.10), JOZINI LOCAL MUNICIPALITY, KWAZULU-NATAL

VERIFICATION PAGE				Form 4.3.1 Rev 13	
REPORT NO. :	41426	DATE:	June 2017	STATUS:	Draft EMPr
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QUALITY VERIFICATION This report has been prepared under the controls established by a quality management system that meets the requirements of ISO9001: 2008 which has been independently certified by DEKRA Certification under certificate number 90906882					
					
Verification	Capacity	Name	Signature	Date	
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LIST OF ACRONYMS

DWS	-	Department of Water and Sanitation
DEAT	-	Department of Environmental Affairs / and Tourism - National
EDTEA	-	Economic Development, Tourism and Environmental Affairs - Provincial
EIA	-	Environmental Impact Assessment
EMPr	-	Environmental Management Programme
ER	-	Employer's Representative
MSDS	-	Material Safety Data Sheet
NEMA	-	National Environmental Management Act (Act 107 of 1998)
WUL	-	Water Use Licence

SECTION A: DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

1. DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Terratest (Pty) Ltd have been appointed by Royal Haskoning DHV (Pty) Ltd (RHDHV), on behalf of KZN Department of Transport (DoT) to undertake the Basic Assessment Process for the proposed upgrading of the gravel District Roads D1841, D1842 and D1884 from Ndumo to EKuhlehleni, Jozini Local Municipality, KwaZulu-Natal.

The Environmental Management Programme (EMPr) was developed by Terratest (Pty) Ltd's Environmental Assessment Practitioner (EAP) whose details and experience are provided in Tables 1 and 2. *Curricula vitae* are appended in Appendix A.

TABLE 1: Details of the EAP

Company Name	Terratest (Pty) Ltd		
Physical address:	6 Pin Oak Avenue, Hilton		
Postal address:	P. O. Box 794, Hilton		
Postal code:	3245	Cell: 082 885 4868	
Telephone:	(033) 343 6786	Fax: (033) 343 6701	
Contact person:	Tarin Strydom		
E-mail:	strydomt@terratest.co.za		

TABLE 2: Expertise of Representatives

EAP	Qualifications & Professional affiliations	Experience at environmental assessments	Contact details
Mr J. Richardson Environmental Scientist	BSc. Hons Environmental Management, IAIAAsa	9 years	Terratest (Pty) Ltd Tel: (033) 343 6789 Email: richardsonj@terratest.co.za
Mrs T. Strydom Environmental Consultant	BSocSc. Geog and Environmental Management, IAIAAsa	7 years	Terratest (Pty) Ltd Tel: (033) 343 6789 Email: strydomt@terratest.co.za

SECTION B: ACTIVITY INFORMATION

1. INTRODUCTION

The proposed project entails the upgrading and construction of a link road between eKuhlehleni Pass and Ndumo via eManyiseni, Jozini Local Municipality, KwaZulu-Natal. The proposed link road comprises of the existing D1841, D1842 and D1884 roads and the upgrading thereof.

In accordance with the Integrated Environmental Management Guidelines published by the Department of Environmental Affairs & Tourism (DEAT) in 1992, the purpose of an EMPr is “to describe how negative environmental impacts will be managed, rehabilitated or monitored and how positive impacts will be maximised”.

National Environmental Management Act, (Act 107 of 1998)

Section 28 of NEMA (National Environmental Management Act, Act 107 of 1998) which pertains to “Duty of care and remediation of Environmental Damage” states that:

“(1) 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 avoided or stopped, to minimise and rectify such pollution or degradation of the environment.”

This EMPr must form an integral part of the contract documents for the proposed construction, as it outlines the methodology & duties required such that construction can be achieved in an environmentally sustainable manner; with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with the project. Such mitigation measures will have a financial impact on the projects costing's.

This EMPr is a dynamic document that may need to evolve during its implementation period, such that it recognises any new issues that may arise; or changes in the parameters of identified issues which can be addressed with the required/amended mitigation.

1.1 The Polluter-Pays Principle

This principle provides for “the costs of remedying pollution, environmental degradation and consequent adverse health 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 must be rigorously applied throughout the Construction Phase of this project.

1.2 Progressive Rehabilitation

Progressive rehabilitation must also be undertaken throughout the Construction Phase of the project with areas that have been impacted on. Rehabilitation must commence as soon as construction is completed in the specific area and not at the end of the entire project.

2. PROJECT LOCATION

The proposed link road comprises of the existing D1841, D1842 and D1884 roads and the upgrading thereof.

The property descriptions are as follows:

- Ndumo B Erf 16638 Portion 2 (NOIV00000001663800002);
- Pongola West Erf 16637 Portion 3 (NOHV00000001663700003); and
- Native Reserve No 16 Erf 15836 Portion 12 (NOHV00000001583600012)

All three properties are owned by the Ingonyama Trust (Matenjwa Tribal Land).

The proposed upgrading of the link road would extend for approximately 32.1 kilometres, from kilometre 0.0 at the D1841 and P435 Intersection at Ndumo, through to the end of D1884 on the boarder of Swaziland. Road coordinates are presented in Table 3, Table 4 presents the coordinates for the watercourse crossings and Table 5 presents the coordinates for the sections of the road that are to be realigned.:

TABLE 3: Road Coordinates

	East	South
Start	32°15'11.506"	26°55'24.2"
End	32°00'27.948"	26°52'53.304"

TABLE 4: Watercourse Crossing Coordinates

	East	South
Watercourse crossing 1	32°14'1.94"	26°54'50.31"
Watercourse crossing 2	32°12'41.22"	26°54'39.88"
Watercourse crossing 3	32°09'16.94"	26°55'10.40"
Watercourse crossing 4	32°05'27.40"	26°55'32.04"

TABLE 5: Road Realignment Coordinates

	Start		End	
	East	South	East	South
Road Realignment 1	32°15'11.61"E	26°55'24.38"S	32°14'21.19"E	26°55'02.60"S
Road Realignment 2	32°09'45.79"E;	26°55'11.87"S	32°05'01.01"E	26°55'19.19"S
Road Realignment 3	32°04'3.07"E	26°54'42.69"S	32°03'52.26"E	26°54'47.44"S
Road Realignment 4	32°03'20.72"E	26°55'12.54"S	32°03'06.75"E	26°55'08.35"S

A Locality Map and Site Layout Plan are included as Appendix 2.

3. PROJECT DESCRIPTION

The required road works start at kilometre 0,0 in Nudmo Town at the intersection of Main Road 435 and continues through the towns of Mbadleni, Kume, Magwandu and terminates at eKuhlehleni, totalling a length of approximately 32,10 kilometres. The existing gravel road and link road will be upgraded to a Class R3 (Rural Minor Arterial) single carriageway consisting of:

- 6,5-metre-wide surfaced road;
- 1-metre-wide surfaced shoulders in both directions; and
- Stormwater drainage facilities.

For the purpose of this report, the extent of the road upgrade will be divided into 3 sections (1, 2 and 3), as per Figure 1 below. The sections that require Environmental Authorisation are displayed in Tables 4 and 5 above and Locality Map attached as Appendix 2.

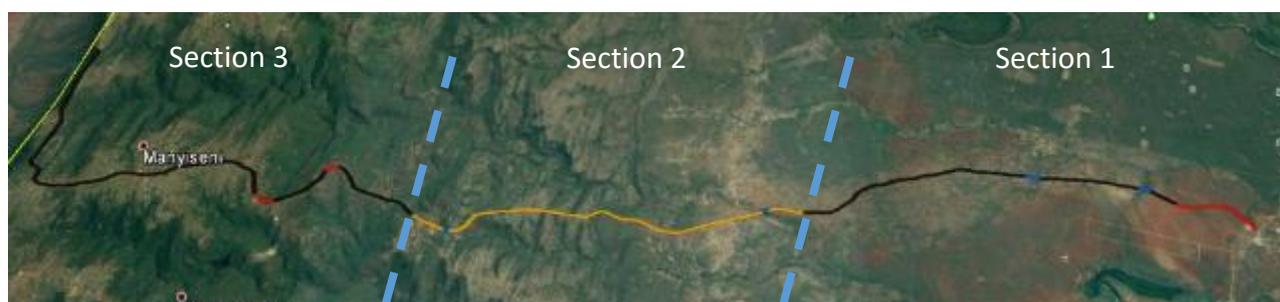


FIGURE 1: Proposed Road Upgrade

Section 1 of the proposed road alignment upgrade begins at the start of the route to be upgraded at $32^{\circ}15'11.506''\text{E}$; $26^{\circ}55'24.2''\text{S}$ and extends to $32^{\circ}9'45.79''\text{E}$; $26^{\circ}55'11.87''\text{S}$, as shown in Figure 2 below.

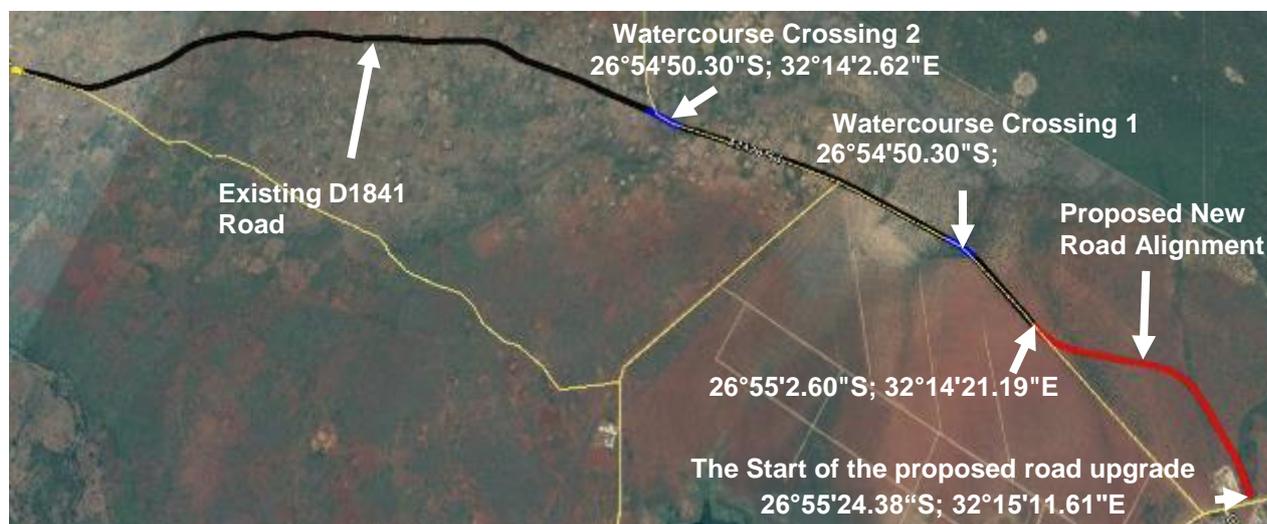


FIGURE 2: Section 1 of the Proposed Road Upgrade

The sections along the road upgrade that are marked in black do not require Environmental Authorisation, as these sections will be resurfaced within the existing road footprint. The sections marked in red are the sections of the road that will require Environmental Authorisation, as these sections are where the road will be realigned. Two watercourse crossing upgrades within the existing road reserve are proposed and will require excavation of more than 5 cubic meters from the watercourse.

To achieve an improved, more direct route between eManyiseni and Ndumo a road upgrade and minor realignment in certain sections is proposed. This 6 kilometre realignment and upgrade along an existing single lane gravel track (indicated in yellow on Figure 3 below) will result in a 5 kilometre reduction in travel distance. The road reserve along this section will be formalised to a 30-metre-wide road reserve throughout the stretch of D1841, D1842 and D1884 as indicated in Figure 6 below.

It is proposed that the D1841, D1842 and D1884 shall have typical road cross sections, for a Type 3 Secondary Road. This provides for 3,25-metre-wide lanes with 1,0-metre-wide surfaced shoulders in each direction. The shoulders will be trimmed off 1,0-metre-wide rounding in fill and 0,5-metre-wide rounding's in cut.



FIGURE 3: Section 2 of the Proposed Road Upgrade

Section 2 contains two watercourse crossings, indicated in blue on Figure 6 above. The existing crossing in the vicinity of Watercourse 3 consists of an existing gravel bridge crossing, (approximately 40 metres long and 5,45 metres wide) over the uMsunduze River and is situated about 615 metres in a north-westerly direction from the new proposed river crossing (Watercourse Crossing 3) which is situated at approximately kilometre 10,4 along the new proposed alignment of D1841. The proposed new river crossing will consist of 4 box cells at 4,8 metres by 4,8 metres in size. The aforementioned watercourse crossing activities fall outside of the existing road reserve and will require new infrastructure to be constructed, as such they will trigger Listed Activity 12 of GN. R 983 of the NEMA: EIA Regulations of 2014 for the construction of infrastructure larger than 100 square meters within 32 metres of a watercourse.

The proposed upgraded stormwater system over the entire route will consist of pipes ranging from 600 millimetres to 1200 millimetres which will be strategically placed to regularly disperse overland and road surface run-off collected in side drains.

Section 3 of the proposed road alignment upgrades ends at coordinates 26°52'53.304\"S; 32°0'27.948\"E along the D1884. A further two minor road realignments are proposed in this section to correct road geometrics on sharp corners, indicated in red, which require Environmental Authorisation. The sections indicated in black, again do not require Environmental Authorisation, as these sections will be resurfaced within the existing road footprint, as indicated in Figure 4 below.



FIGURE 4: Section 3 of the Proposed Road Upgrade

The D1883 can be accessed from D1841 via a tee-junction situated at approximately kilometre 3,0 along the proposed road upgrade. This tee-junction will be formalised into a B1 type access of the KwaZulu-Natal Department of Transport standard details. New accesses have been positioned according to the Town Planning Layout and access to existing schools, public facilities, government institutions, housing settlements and villages. There are numerous accesses to properties, some of which will be provided with concrete edge beams. Others will have to be closed for safety reasons. With an aim to keep the realignment within the footprint of the existing road, possible alternative routes were not investigated due to the increased cost and disturbance on to the surrounding environment.

4. ACTIVITY DESCRIPTION

In terms of the Environmental Impact Assessment (EIA) Regulations (2014), promulgated in terms of the National Environmental Management Act, 1998 (NEMA), certain Listed Activities are specified for which either a Basic Assessment (GN R 983 and 985) or a full Scoping and EIA (GN R 984) is required.

The following Listed Activities in Government Notice (GN) R 983 (Listing Notice 1) and 985 (Listing Notice 3) requiring a Basic Assessment (BA) Process are applicable to the proposed road upgrade:

- GNR 983, Item 12:** “The development of – (iii) bridges exceeding 100 square metres in size; (xii) infrastructure or structures with a physical footprint of 100 square metres or more.”

This activity is applicable as the construction of new watercourse crossings and associated infrastructure at Watercourse Crossings 3 & 4 will be required as part of the upgrading of the existing track. Watercourse crossing infrastructure at Watercourse Crossings 1 & 2 falls within the existing road reserve and this activity is therefore not triggered. The two watercourse crossings where this activity will be triggered is presented in Table 4 and Appendix 2: Locality Map.
- GNR 983, Item 19:** “The infilling or depositing of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shell grit, pebbles or rock of more than 5 cubic metres from – (i) a watercourse.

This activity is applicable as the construction and upgrading of bridges and culverts, bulk stormwater outlet structures and infrastructure covering 50 square metres or more will occur along the route.

The proposed project contains 4 watercourse crossings where this activity will be triggered as presented in Table 4 and Appendix 2: Locality Map.

- GNR 983, Item 56:** “The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre – (i) where the existing reserve is wider than 13,5 metres, (ii) where no reserve exists, where the existing road is wider than 8 metres”

This activity is applicable as the existing single road track will be widened by more than 6 metres as well as the sections of the road where it is proposed that a realignment would be required. For these sections there currently is no existing road or road reserve, the road will be constructed to a width of more than 8 metres, outside of urban areas.
- GNR 985, Item 18:** “The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre (d) in KwaZulu-Natal: (vi) A protected area identified in terms of NEMPAA; and (xii) outside urban areas: (aa) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve,”

This listed activity is applicable to the first +/- 1.5 kilometres of road (from Ndumo Town) which is to be realigned and falls within 5 kilometres of the Ndumo Game Reserve.

In terms of the Amended Regulations (2014), dated 7 April 2017, the following similarly Listed Activities contained within Government Notice (GNR) 327 (Listing Notice 1) and 324 (Listing Notice 3) requiring a Basic Assessment Process are applicable to the proposed road upgrade:

- GNR 327, Item 12:** “The development of – (iii) bridges exceeding 100 square metres in size; (xii) infrastructure or structures with a physical footprint of 100 square metres or more.”

This activity is applicable as the construction of new watercourse crossings and associated infrastructure at Watercourse Crossings 3 & 4 will be required as part of the upgrading of the existing track. Watercourse crossing infrastructure at Watercourse Crossings 1 & 2 falls within the existing road reserve and this activity is therefore not triggered. The two watercourse crossings where this activity will be triggered is presented in Table 4 and Appendix 2: Locality Map.
- GNR 327, Item 19:** “The infilling or depositing of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse.”

This activity is applicable as the construction and upgrading of bridges and culverts, bulk stormwater outlet structures and infrastructure covering 50 square metres or more will occur along the route. The proposed project contains 4 watercourse crossings where this activity will be triggered as presented in Table 4 and Appendix 2: Locality Map.
- GNR 327, Item 56:** “The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre – (i) where the existing reserve is wider than 13,5 metres, (ii) where no reserve exists, where the existing road is wider than 8 metres.”

This activity is applicable as the existing single road track will be widened by more than 6 metres as well as the sections of the road where it is proposed that a realignment would be required. For these sections there currently is no existing road or road reserve, the road will be constructed to a width of more than 8 metres, outside of urban areas.
- GNR 324, Item 18:** “The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre (d) in KwaZulu-Natal: (vi) A protected area identified in terms of NEMPAA; and (xii) outside urban areas: (aa) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve.”

This listed activity is applicable to the first +/- 1.5 kilometres of road (from Ndumo Town) which is to be realigned and falls within 5 kilometres of the Ndumo Game Reserve

Based on the above Listed Activities triggered by the proposed development, a BA Process is required in order to obtain Environmental Authorisation for the aforementioned triggered Listed Activities. This EMPr forms part of the BA submission.

5. SITE DESCRIPTION

5.1 Topography

The topography comprises undulating terrain, dissected by two large alluvial floodplains associated with the Mkuze and Phongolo Rivers. Altitude ranges from 20- 803 metres. Due to the linear nature of the proposed link road, various landforms are present. The majority of the link road lies within a plain, open valley, undulating plain and side slopes of hills / mountains.

5.2 Vegetation

The proposed road upgrade and realignment traverses three vegetation types, namely:

- Western Maputaland Clay Bushveld (SVI 20). This vegetation type is characterised by mixed compound leaved short woodland (trees between 5 metres – 10 metres) and wooded grasslands. Its conservation status is listed as “Vulnerable”.
- Southern Lebombo Bushveld (SVI 16). This vegetation type is characterised by open bushveld with dominant *Acacia* and *Combretum* species and *Themeda triandra* grass being the dominant grass in undisturbed area. Its conservation status is listed as “Least Threatened”.
- Lebombo Summit Sourveld (SVI 17). This vegetation type is characterised by open, tall, sour, wiry grasslands, often dotted with low bushes and solitary savannah trees. Its conservation status is listed as “Endangered”.

The Ezemvelo KZN Wildlife (EKZNW) MINSET database was also interrogated. According to the database, a small portion of the realignment towards the town of Ndumo falls within an area designated as a Biodiversity Priority Area 1 and a small portion in the middle of the road to be upgraded falls within an area designated as a Biodiversity Priority Area 3. Two small areas along the proposed road upgrade falls within areas identified by EKZNW as 100% transformed.

The Biodiversity Priority Area 3 areas are defined as negotiable sites with an irreplaceability score of less than 0.8. This doesn't mean that they have a lower biodiversity value, only that there are alternate options for the conservation of these biodiversity features elsewhere. It must be noted, however, that much of the area surrounding the route is highly transformed through residential settlement. Limited natural vegetation and biodiversity therefore remains.

5.3 Hydrology

The project area drains via unnamed tributaries into the uMsunduzi River, which runs in a south east direction, discharging initially into the Ngwavuma River and then into the Phongolo River.

The proposed project site lies in the Usuthu to Pongolo Water Management Area (WMA; WMA 6), in quaternary catchments W43F and W53F. The most significant/triggered water courses in the vicinity of the proposed road route included the Ngwavuma River (abstraction point), uMsunduzi River crossing (new 4 No.

Box culvert on D1841), unnamed drainage line crossing (new pipe culvert on D1841) and four wetland systems. The uMsunduzi River drains to the Ngwavuma River.

The planned source of water for construction activities is the Ngwavuma River at a proposed abstraction point: 26°56'27.56" S; 32°14'32.98" E.

A copy of the Water Use Licence is attached as Appendix 3.

SECTION C: IMPACT MANAGEMENT OBJECTIONS, ACTIONS AND OUTCOMES

GNR 982, Appendix 4 of the EIA Regulations 2014, notes that the identified impacts of development are to be presented with the management objectives, actions and outcomes. Tables 6 and 7 present the required information, together with the responsible person and the frequency to which the management objectives must be monitored. In this regard, the Contractor, the Engineer, a designated on-site Environmental Manager (EM), an independent Environmental Control Officer (ECO) and the Employer are the custodians of this EMPr.

TABLE 6: Pre-Construction Management Objectives, Actions and Outcomes

Pre-Construction Phase				
Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Responsibility	Frequency/Timing
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>		
Prevent soil contamination	<ul style="list-style-type: none"> Hazardous materials/dangerous goods must be stored in a clearly marked, lockable, designated storage area; Hazardous materials/dangerous goods must be stored within a 110% bunded area or on an impermeable surface; and Chemical toilets must be placed outside 100 metres from any watercourse. A registered chemical waste company is to be used to remove waste from the chemical toilets on site. Documentation for this must be kept by the contractor for review purposes by the ECO if needed. 	<p>Avoidance of soil loss</p> <p>Re-use of viable soils in rehabilitation</p> <p>Avoidance of disposal of hazardous waste</p>	<p>Implementation: Contractor</p> <p>Inspection: EM</p> <p>Verification: ECO</p>	<p>Implementation: Ongoing</p> <p>Inspection: <i>Ad hoc</i></p> <p>Verification: Monthly</p>
Preservation of flora	<ul style="list-style-type: none"> All construction areas must be demarcated prior to construction to ensure that the footprint of the impacts are limited (including areas where vehicles may traverse); All alien invasive species within the construction and development footprint must be removed and follow up monitoring and removal programmes must be initiated once construction is complete; Harvesting of flora is strictly forbidden; When the final design is available for the road alignment, a specialist is to identify and mark all trees that will require permits trees that might be affected along the alignment; 	A robust landscaped open space with appropriate indigenous vegetation to support flora and fauna.	<p>Implementation: Contractor Specialist when required</p> <p>Inspection: EM and ECO</p> <p>Verification: ECO</p>	<p>Implementation: Pre-construction and during bulk earthworks</p> <p>Inspection: Pre-construction;</p> <p>Verification: Pre-construction</p>

Pre-Construction Phase				
Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Responsibility	Frequency/Timing
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>		
	<ul style="list-style-type: none"> A 30 metre buffer must be demarcated along the edge of all watercourses that are nearest to the road and be designated as a “no-go” area during the construction phase. 			
Preservation of fauna	<ul style="list-style-type: none"> Poaching/hunting and/or fishing activities on site is prohibited. This includes the setting of traps, or the killing of any animal caught in construction works; No animal, reptile or bird of any sort found on site may be killed. This specifically includes snakes or other animals considered potentially dangerous discovered on site. If such an animal is discovered on site an appropriately skilled person must be summoned to remove the animal from the site. Consideration should be given to selection and nomination of such a person prior to site establishment. If no-one is available, training should be provided to at least two site staff members; and Environmental training must be conducted by the responsible ECO. 	A robust landscaped open space with appropriate indigenous vegetation to support flora and fauna.	Implementation: All Inspection: EM Verification: ECO	Implementation: Construction to closure Inspection: <i>Ad hoc</i> Verification: <i>Ad hoc</i>
Prevent increased surface runoff	<ul style="list-style-type: none"> A stormwater management plan, including sufficient erosion-control measures, must be compiled in consultation with a suitably qualified environmental practitioner / control officer during the detailed design phase prior to the commencement of construction. 	A well covered dense rehabilitated open space to reduce run-off energy and reduce peak flows. Establishment of approved water retention facility	Implementation: Contractor & Engineer Inspection: EM & Engineer Verification: ECO	Implementation: Construction to closure Inspection: Pre-construction Verification: Pre-construction
Prevent noise pollution	<ul style="list-style-type: none"> Noise sources must conform to the South African Bureau of Standards recommended code of practice, SANS Code 0103:1983; and All equipment must be fitted with effective exhaust silencers and must comply with the South African Bureau of Standards recommended code of practice and the South African National Standard (SANS) Code 0103:1983 for construction plant noise generation. 	No ambient noise impacts relating to plant operations Compliance to municipal by-laws No nuisance conditions created	Implementation: Contractor Inspection: EM Verification: ECO	Implementation: Pre-construction and <i>ad hoc</i> Inspection: Pre-construction and <i>ad hoc</i> Verification:

Pre-Construction Phase				
Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Responsibility	Frequency/Timing
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>		
				<i>Ad hoc and monthly as a minimum</i>
Prevent the spread of waste	<ul style="list-style-type: none"> Demarcated areas where waste can be securely contained and stored on a temporary basis during the construction phase must be established. When adequate volumes (not more than 1 month) have accumulated all waste is to be removed from site and disposed of at a licensed facility; Spill-sorb or similar type products must be readily available to absorb hydrocarbon spills in the event that such spills should occur. 	<p>The prevention or the mitigation of the spread of waste</p> <p>Compliance to the Norms and Standards for the storage of waste</p> <p>Prevention of soil and or water contamination Avoidance of nuisance vectors</p>	<p>Implementation: EM & Contractor</p> <p>Inspection: EM & ECO</p> <p>Verification: ECO</p>	<p>Implementation: Planning and approval stages</p> <p>Inspection: Pre-construction and <i>ad hoc</i></p> <p>Verification: <i>Ad hoc</i> and monthly as a minimum</p>
Prevent Pollution of Water Resources	<ul style="list-style-type: none"> Appropriate stormwater / surface water management measures must be put in place before construction commences and maintained throughout the lifetime of the development; An appropriate number of toilets must be provided for labourers during the Construction Phase. These must be maintained in a satisfactory condition and a minimum of 100m away from any water resources and outside of the 1:100 year floodline; The Construction Camp must be positioned on previously disturbed areas (if possible) and outside of the 1:100 year floodline or 100m away from wetland areas, whichever is the greatest; A 30 metre buffer must be demarcated along the edge of all watercourses that are nearest to the road and be designated as a “no-go” area during the construction phase; and Soil erosion prevention measures must be implemented such as gabions, sand bags etc. whilst energy dissipaters must be constructed at any surface water outflow points. The site must be monitored by the Contractor weekly for any signs of off-site siltation. All 	<p>The prevention or the mitigation of the spread of water pollution</p> <p>Compliance to the Norms and Standards for work within watercourses</p> <p>Prevention of water and or soil contamination</p>	<p>Implementation: Contractor & Engineer</p> <p>Inspection: EM & ECO</p> <p>Verification: ECO</p>	<p>Implementation: Planning and approval stages</p> <p>Inspection: Pre-construction and <i>ad hoc</i></p> <p>Verification: <i>Ad hoc</i> and weekly as a minimum</p>

Pre-Construction Phase				
Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Responsibility	Frequency/Timing
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>		
	areas impacted by earth-moving activities must be re-shaped post-construction to ensure natural flow of runoff and to prevent ponding.			

TABLE 7: Pre-Construction Management Objectives, Actions and Outcomes

Construction Phase				
Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Responsibility	Frequency/Timing
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>		
Prevent soil contamination	<ul style="list-style-type: none"> Hazardous materials/dangerous goods must be stored in a clearly marked, lockable, designated storage area; Hazardous materials/dangerous goods must be stored within a 110% bunded area or on an impermeable surface; and Chemical toilets must be placed outside 100 metres from any watercourse. A registered chemical waste company is to be used to remove waste from the chemical toilets on site. Documentation for this must be kept by the contractor for review purposes by the ECO if needed. 	<p>Avoidance of soil loss</p> <p>Re-use of viable soils in rehabilitation</p> <p>Avoidance of disposal of hazardous waste</p>	<p>Implementation: Contractor</p> <p>Inspection: EM & ECO</p> <p>Verification: ECO</p>	<p>Implementation: Ongoing</p> <p>Inspection: <i>Ad hoc</i></p> <p>Verification: Monthly</p>
Prevent soil loss	<ul style="list-style-type: none"> Soil must be stockpiled in such a way as to minimize erosion; Topsoil must be stockpiled such that re-use in rehabilitation is feasible; The exposed soil surfaces must be protected from wind derived fugitive dust generation, if to be exposed for a period exceeding 2 months or in high wind conditions; Where exposed surfaces will be exposed to surface run-off, diversion of surface run-off must be implemented to ensure erosion is avoided; The re-use of soil and stockpiles must be prioritised in the construction phase, where geotechnically appropriate; Soil erosion prevention measures must be implemented such as gabions, sand bags etc. whilst energy dissipaters must be constructed at any surface water outflow points. The sites must be monitored weekly for any signs of off-site siltation; All areas impacted by earth-moving activities must be re-shaped post-construction to ensure natural flow of runoff and to prevent ponding; 	<p>Re-use of viable soil in rehabilitation</p> <p>Low / No fugitive dust deposition</p> <p>No loss of topsoil or soils from the site during construction</p>	<p>Implementation: Contractor & Engineer</p> <p>Inspection: EM and ECO</p> <p>Verification: ECO</p>	<p>Implementation: Pre-construction and prior to implementation of rehabilitation</p> <p>Inspection: Ad hoc and weekly as a minimum</p> <p>Verification: Monthly</p>

Construction Phase				
Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Responsibility	Frequency/Timing
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>		
	<ul style="list-style-type: none"> All exposed earth must be rehabilitated promptly with suitable vegetation to stabilize the soil; and Any exposed earth must be rehabilitated promptly with suitable vegetation to protect the soil. Vigorous grasses planted with fertiliser are very effective at covering exposed soil. It is important to note, that the use of fertilisers, must be undertaken with caution and must not be allowed, in any circumstances, to run into drainage lines / wetlands, to avoid any possible eutrophication impacts. 			
Preservation of flora	<ul style="list-style-type: none"> All construction areas must be demarcated prior to construction to ensure that the footprint of the impacts are limited (including areas where vehicles may traverse); All alien invasive species within the construction and development footprint must be removed and follow up monitoring and removal programmes must be initiated once construction is complete; Harvesting of flora is strictly forbidden; All exposed earth must be rehabilitated promptly with suitable vegetation to protect the soil. Vigorous grasses planted with fertiliser are very effective at covering exposed soil. Necessary rehabilitation measures (e.g. burning, seeding, removing alien plants etc.) must be introduced to ensure species composition reverts to a more natural state (with regards to affected areas). Indigenous vegetation with deep set root systems are advisable to limit soil loss on site. Alternatively, water dissipating mechanisms such as gabions or reno-mattresses may be implemented on-site to help stabilize the surrounding soil and provide a platform for the growth of vegetation; Soil erosion must be monitored and any scars must be repaired; 	A robust landscaped open space with appropriate indigenous vegetation to support flora and fauna.	Implementation: Contractor & Specialist where required Inspection: EM Verification: ECO	Implementation: Ongoing and during rehabilitation Inspection: <i>Ad hoc</i> and weekly as a minimum Verification: Monthly

Construction Phase				
Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Responsibility	Frequency/Timing
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>		
	<ul style="list-style-type: none"> When the final design is available for the road alignment a specialist is to identify and mark all trees that require permits that might be affected along the alignment; A 30 metre buffer must be demarcated along the edge of the waterbodies that are nearest to the road and be designated as a “no-go” area during the construction phase; and Landscaping and the planting of indigenous plants must be carried out along the footprint of the roads upgrade footprint to ensure the stabilisation of the embankments. 			
Preservation of fauna	<ul style="list-style-type: none"> Poaching/hunting and/or fishing activities on site is prohibited. This includes the setting of traps, or the killing of any animal caught in construction works; No animal, reptile or bird of any sort found on site may be killed. This specifically includes snakes or other animals considered potentially dangerous discovered on site. If such an animal is discovered on site an appropriately skilled person must be summoned to remove the animal from the site. Consideration should be given to selection and nomination of such a person prior to site establishment. If no-one is available, training should be provided to at least two site staff members; and Environmental training must be conducted by the responsible ECO. 	A robust landscaped open space with appropriate indigenous vegetation to support flora and fauna.	Implementation: All Inspection: EM Verification: ECO	Implementation: Ongoing Inspection: <i>Ad hoc</i> and weekly as a minimum Verification: Monthly
Prevent increased surface runoff	<ul style="list-style-type: none"> Adequate erosion control measures must be implemented when removing vegetation; 	A well covered dense rehabilitated open space to reduce run-off energy and reduce peak flows. Establishment of approved water retention facility	Implementation: Contractor & Engineer Inspection: EM Verification: ECO	Implementation: Ongoing Inspection: <i>Ad hoc</i> and weekly as a minimum Verification: Monthly

Construction Phase				
Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Responsibility	Frequency/Timing
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>		
Preserve air quality	<ul style="list-style-type: none"> Heavy vehicles and machinery must be serviced regularly to minimise exhaust fume pollution; Soil stockpiles must be located in areas to limit the erosive effects of the wind, which will limit dust; Removal of vegetation must be avoided until such time as soil stripping is required, which will limit dust; Limit vehicle speeds on unpaved roads to 20 km/h to limit the amount of dust generated; Haulage distances must be at a minimum; Water must be sprayed onto gravel roads when required; Environmental friendly soil stabilisers may be used as additional measures to control dust on gravel roads and construction areas; All equipment must be kept in good working order; Equipment must be operated within its specifications and capacity and must not be overloaded; All machinery/plant must be serviced and lubricated regularly to ensure a good working order; and Vehicles must be fitted with effective exhaust silencers and shall comply with Road Traffic Act (Act 29 of 1989) when any such vehicle is operated on a public road. 	No fugitive dust exceeding SANS regulations or creating nuisance conditions	Implementation: Contractor Inspection: EM & ECO Verification: ECO	Implementation: Monthly or at the prescribed vehicle/plant manufacturers specifications Daily for management measures Inspection: <i>Ad hoc</i> and weekly as a minimum Verification: Monthly
Prevent noise pollution	<ul style="list-style-type: none"> All potential noise sources must conform to the South African Bureau of Standards recommended code of practice, SANS Code 0103:1983; and All Contractors' equipment must be fitted with effective exhaust silencers and shall comply with the South African Bureau of Standards recommended code of practice and the South African National Standard (SANS) Code 0103:1983, for construction plant noise generation. 	No ambient noise impacts relating to plant operations Compliance to municipal by-laws No nuisance conditions created	Implementation: Contractor Inspection: EM & ECO Verification: ECO	Implementation: Monthly or at the prescribed vehicle/plant manufacturers specifications Daily for management measures Inspection: <i>Ad hoc</i> and weekly as a minimum Verification:

Construction Phase				
Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Responsibility	Frequency/Timing
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>		
Prevent visual unsightliness	<ul style="list-style-type: none"> Speed limits and dust suppression techniques as discussed in the sections above must be implemented; and Shade cloth must be placed on the boundary fence of the construction camp. 	The prevention or the mitigation of unsightliness	Implementation: EM & Contractor Inspection: EM & ECO Verification: ECO	Monthly Implementation: <i>Ad hoc</i> and daily Inspection: <i>Ad hoc</i> and daily Verification: Monthly
Prevent unnecessary impedance of traffic	<ul style="list-style-type: none"> Flagmen and signage must be employed; Designated areas for the storage of heavy vehicles must be provided; Vehicle traffic which may obstruct traffic flow must be scheduled outside of peak travelling time; Heavy / large load traffic must be appropriately routed and appropriate safety precautions must be taken to prohibit road collisions and traffic incidences; Vehicle operators must be suitably licensed, have appropriate environmental and safety induction, be aware of specific site procedures, and must be well rested and cognisant when operating heavy or unsafe vehicles / machinery; Any damage to surrounding roads must be repaired as soon as possible to prevent deterioration to the road network. 	The prevention or the mitigation of the impedance of traffic	Implementation: Contractor Inspection: EM & ECO Verification: ECO	Implementation: Daily and <i>ad hoc</i> Inspection: <i>Ad hoc</i> and weekly as a minimum Verification: Monthly
Prevent the spread of waste	<ul style="list-style-type: none"> Demarcated areas where waste can be securely contained and stored on a temporary basis during the construction phase must be established. When adequate volumes (not more than 1 month) have accumulated all waste is to be removed from site and disposed of at a licensed facility; Litter must be removed from all construction areas prior to and after construction commencement; 	The prevention or the mitigation of the spread of waste Compliance to the Norms and Standards for the storage of waste No presence of nuisance vectors	Implementation: Contractor Inspection: EM & ECO Verification: ECO	Implementation: Daily and <i>ad hoc</i> Inspection: <i>Ad hoc</i> and weekly as a minimum Verification: Monthly

Construction Phase				
Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Responsibility	Frequency/Timing
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>		
	<ul style="list-style-type: none"> • Should skips be used for the storage and transportation of waste, these must to be emptied once full and covered to prevent waste from being blown away; • Waste is not to be buried on site; • Storage of waste volumes must not exceed those stipulated in NEM:WA, schedule 1; • All waste must be recycled where possible or disposed of at a registered landfill, proof of which must be provided; • All hazardous materials including paints, turpentine and thinners must be stored appropriately to prevent these contaminants from entering the environment; and • Spill-sorb or similar type product must be used to absorb hydrocarbon spills in the event that such spills occur. 			
Prevent Pollution of Water Resources	<ul style="list-style-type: none"> • An appropriate number of toilets must be provided for labourers during the Construction Phase. These must be maintained in a satisfactory condition and a minimum of 100m away from any water resource and outside of the 1:100 year floodline; • Any contaminated water associated with construction activities must be contained in separate areas or receptacles such as Jo-Jo tanks or water-proof drums, and must not be allowed to enter into any watercourse; • The Construction Camp must be positioned on previously disturbed areas (if possible) and outside of the 1:100 year floodline or 100m away from wetland areas, whichever is the greatest; • A 30 metre buffer must be demarcated along the edge of the waterbodies that are nearest to the road and be designated as a “no-go” area during the construction phase • Soil erosion prevention measures must be implemented such as gabions, sand bags etc. whilst energy dissipaters must be constructed at any surface water 	<p>The prevention or the mitigation of the spread of water pollution</p> <p>Compliance to the Norms and Standards for work within watercourses</p> <p>Prevention of water and or soil contamination</p>	<p>Implementation: Contractor & Engineer</p> <p>Inspection: EM & ECO</p> <p>Verification: ECO</p>	<p>Implementation: Planning and approval stages</p> <p>Inspection: Ad hoc and weekly as a minimum</p> <p>Verification: Monthly</p>

Construction Phase				
Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Responsibility	Frequency/Timing
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>		
	<p>outflow points. The site must be monitored by the Contractor weekly for any signs of off-site siltation. All areas impacted by earth-moving activities must be re-shaped post-construction to ensure natural flow of runoff and to prevent ponding;</p> <ul style="list-style-type: none"> • Appropriate silt control mechanisms must be installed around all soil excavations to prevent silt from entering the surrounding watercourses; • Should any excavations require dewatering, this is to occur through an adequately designed silt trap prior to discharge. All silt traps are to be regularly monitored and maintained to ensure efficient and effective use; • Landscaping and the planting of indigenous plants must be carried out along the footprint of the proposed roads upgrade footprint to ensure the stabilisation of the embankments; • Sandbag berms must be placed at regular intervals on all steep slopes and on the trench line before and after backfilling in order to minimise erosion and the discharge of contaminated stormwater runoff onto watercourses; • If there is a scour risk that potholes may form on the existing roads, it can be managed by using suitable gravel to temporarily repair the scouring or potholes; • At the end of the construction phase, the site must be fully revegetated to match the pre-construction condition if possible; • Construction within a watercourse must be kept in line with Section 3.3.1.5 of the D1841 Ndumo Road Upgrade, KwaZulu-Natal Watercourse Crossings Construction Work Method Statement Report, as attached in Appendix 4; • Temporary restriction of watercourses required during construction, must take place during the dry season; 			

Construction Phase				
Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Responsibility	Frequency/Timing
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>		
	<ul style="list-style-type: none"> The construction servitude within watercourses must be kept to 30 metres in width; Should water be pumped from the dry working space within the watercourse, this water must be pumped into a retention dam/silt lagoon (or similar structure) to ensure sediment settles and clean water is released back into the watercourse; No material may be stored for longer than 24-hours within the working area within watercourses. Materials sufficient for the day's work may only be allowed within the working area within the watercourse; Where the Contractor wishes to deviate from the prescribed construction method statement, they must draft a site specific method statement for the approval of the Project Manager and the ECO. The method statement must comply with the EA, the EMPr and any other applicable license and permits; and Construction within watercourses must be monitored by the ECO on a weekly basis. 			
Prevent unnecessary loss of heritage artefacts	<ul style="list-style-type: none"> The KwaZulu-Natal Heritage Act requires that all operations exposing graves, archaeological and historical residues must cease immediately pending an evaluation by the heritage authorities; A buffer of 30m must be maintained around the two Stone Age Sites identified. No development or removal of artefacts may take place within this zone, As per Heritage Impact Assessment Report attached as Appendix 7 of the Basic Assessment report; A buffer of 35m must be maintained around all grave sites identified, as per Heritage Impact Assessment Report attached as Appendix 7 of the Basic Assessment report . Should the developer decide to translocate graves then a Phase Two Heritage Impact Assessment by a grave relocation expert must be initiated. A process 	The prevention or the mitigation of the loss of heritage artefacts	Implementation: EM & Contractor Inspection: EM & ECO Verification: ECO	Implementation: Daily and <i>ad hoc</i> Inspection: <i>Ad hoc</i> and weekly as a minimum Verification: Monthly

Construction Phase				
Impact management objectives of an EMPr	Impact management actions of an EMPr	Impact management outcomes of an EMPr	Responsibility	Frequency/Timing
<i>A thing aimed at or sought, a goal</i>	<i>The process of doing something, typically to achieve an aim</i>	<i>The way a thing turns out; a consequence</i>		
	<p>of community consultation and negotiation must be initiated to facilitate such a process; and</p> <ul style="list-style-type: none"> • Environmental awareness training must include the importance of heritage and mitigation measures to prevent disturbance. 			

SECTION D: COMPLIANCE WITH THE EMPr

1. COMPLIANCE WITH THE EMPr

1.1 Signing of the EMPr

The Acknowledgement Form at the back of the EMPr (Appendix 2), must be signed by the Proponent, Implementing Agent, all Contractors and sub-contractors, the Employer's Representative (ER) and the Environmental Control Officer (ECO); acknowledging that all parties are familiar with the requirements of the EMPr.

1.2 Legislation

Of importance are all national, provincial and municipal by-laws and regulations. Statutes are amended periodically and it is the Proponent's responsibility to identify legislation relevant to the proposed activity.

1.3 Record Keeping

The Implementing Agent and appointed ECO must monitor the Contractor's adherence to the approved impact prevention procedures on a monthly basis, and must issue the Contractor a Notice of Non-compliance whenever transgressions are observed. The ECO must document the nature and magnitude of any non-compliance, the action taken to correct the non-conformance, the actions taken to mitigate its effects and the results of those actions. The results thereof must be reported to the Compliance and Monitoring section of the Department of Economic Development, Tourism and Environmental Affairs (EDTEA) in the form of an Audit Report, to be compiled by the ECO, but submitted by the Implementing Agent.

Any emergency incidents occurring during the Construction Phase must be reported to the EDTEA: Compliance and Monitoring, as well as other affected parties such as the Department of Water and Sanitation (DWS). Records relating to monitoring and auditing must be kept on site and made available for inspection by the EDTEA: Compliance and Monitoring and any other relevant authorities.

1.4 Monitoring and Compliance

The monitoring and compliance of the development must take place as follows:

- An ECO must audit the construction site during the Construction and Rehabilitation Phase;
- The ECO must audit the site once per month until completion of the rehabilitation phase of project; and
- The Project Manager is responsible to ensure that an Environmental Audit Report is submitted to the EDTEA: Compliance and Monitoring for the duration of the construction period.

1.5 Auditing Process

The terms of reference for the audits must comprise the following:

- Develop a checklist against which the criteria can be referenced during the audit;
- During the audit process, key individuals involved with the management of the site/project are to be given the opportunity to comment on issues being audited and will be invited to accompany the Auditor/ECO during the site inspection; and
- Compile a monthly Audit Report on the implementation of the EMPr and submit this report to the Competent Authority (EDTEA: Compliance and Monitoring), via the Proponent.

1.6 Failure to Complete Corrective Actions

In the event that a Contractor fails or refuses to complete the corrective action, either at all or within the allocated timeframe, the ECO must:

- Formally (in writing) inform the Engineer; and
- Motivate that a Stop-work Order be issued to the Contractor.

The Engineer is responsible for resolving any impasses with the Contractor if applicable. Failure to address any non-compliance may lead to the termination of the contract and removal of the Contractor and staff from the site.

The Engineer / Contractor are deemed not to have complied with the EMPr if:

- Within the boundaries of the site there is evidence of a contravention of clauses; or
- Environmental damage occurs due to negligence / inappropriate actions taken by the Contractor or any of his staff.

On receiving a Notice of Non-compliance, the Contractor is required to swiftly address the issue/s taking all corrective actions required to rectify the situation.

Failure to address the cause must be reported to the relevant Authority for them to deal with the transgression as deemed fit.

2. GENERAL CONSTRUCTION PHASE EMPR REQUIREMENTS

Construction Phase EMPr activities are those relating to the preparation of the site prior to commencing the Construction Phase, as well as the construction and rehabilitation activities themselves.

2.1 Preparation of Method Statements / Management Plans

Method Statements and/or Management Plans shall be submitted by the Contractor to the Engineer and Environmental Control Officer for approval for the following activities prior to any construction commencing on site:

1. Construction camp locality and layout plans;
2. Management, use and storage of hazardous goods / substances, including petrochemicals;
3. Stormwater management at the construction Camp/s and at the construction work front;
4. Traffic, accommodation and construction vehicle movement routes during the Construction Phase;
5. Spill Contingency Plan;
6. Alien invasive Plant Management Plan during construction;
7. Management plan for working in close proximity to sensitive environmental features identified on the site, namely wetland areas which hold water resource and biodiversity value;
8. Emergency Response Procedures; and
9. Construction footprint rehabilitation plan.

The EM must monitor the implementation of the Method Statements and Management Plans during the Construction Phase of the project.

2.2 Permit Requirements

The necessary permits must be obtained by the Engineer and Contractor prior to the commencement of any activities requiring such a permit. These could include permits for activities such as:

- The disposal of effluent on site;
- Impacting on water resources, would constitute a Water Use Licence (WUL) from the Department of Water and Sanitation (DWS);
- Permit requirements should items of heritage significance be identified during earthmoving activities; and
- Permit requirements should tree removal be required.

3. AMENDMENTS TO THE EMPr

This EMPr outlines the environmental practices and mitigation measures to be adhered to during the Construction Phase, in order to curtail and/or minimise potential negative impacts and promote sound environmental practises.

The EMPr is a dynamic document and is subject to change from time to time. Amendments to the EMPr will require consultation with the Environmental Consultants and approval from the EDTEA: Compliance and Monitoring Department.

4. ENVIRONMENTAL AWARENESS TRAINING

The Contractor shall ensure that adequate environmental awareness training of senior site personnel takes place and that all construction workers receive an induction presentation on the importance and implications of the EMPr.

The presentation shall be conducted, as far as possible, in the employees' language of choice.

As a minimum, training shall include:

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

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

5. STAFF CONDUCT CONTROL AND INFORMATION SHEET

ALL STAFF MUST OBEY THE FOLLOWING RULES:	
1	DO NOT tamper with or destroy nesting sites, lairs or any other form of animal shelter.
2	DO NOT leave the construction sites untidy and strewn with rubbish that will attract animal pests.
3	DO NOT trespass on private properties not linked to the project or adjacent to the project.
4	DO NOT carry a weapon on the construction sites or in the vehicles transporting workers to and from the construction sites.
5	DO NOT set fires unnecessarily.
6	DO NOT cause any unnecessary disturbing noise at the construction site or at any designated worker collection/drop off points.
7	DO NOT drive a vehicle under the influence of alcohol.
8	DO NOT exceed the national speed limits on public roads.
9	DO NOT drive a vehicle that is generating excessive noise (noisy vehicles must be reported and repaired as soon as possible).
10	DO NOT litter along the roadsides, including both public and private roads.
11	DO NOT remove or destroy vegetation at the construction camp / construction site without the prior consent of the Contractor and ECO.
12	DO NOT tamper with, destroy or remove vegetation from any areas that have been fenced off or marked.
13	DO NOT pollute watercourses, whether flowing or not.
14	DO NOT drive through the watercourses except at designated points.
15	DO NOT operate critical items of mechanical equipment without having been trained and certified.
16	ALL employees must undergo the necessary safety training and wear the necessary protective clothing at all times.
17	NO ad-hoc activities are to be undertaken e.g. fires for cooking, the use of surrounding bush as a toilet facility is strictly forbidden
18	NO worker may be forced to do work that is potentially dangerous or for what he / she is not trained to do.

6. ALIEN PLANT CONTROL

Best practice measures that should be undertaken during clearing include the following:

- (i) Cut plants as low to ground as possible.
- (ii) All alien plants must be removed carefully and exposed soil should be covered with cut vegetation or leaf litter that is free of weed seeds to ensure that regrowth will not occur.
- (iii) Press any loosened soil down carefully and firmly and mulch with plant material where possible.
- (iv) All alien seeds, fruit bulbs, tubers and stems must be collected and placed in a sealable container/plastic bag for disposal at a landfill site.
- (v) The roots system of mature trees including alien invasive play an important role in stabilising soil and therefore the up-rooting of large mature specimen of trees is not advocated. It is better to fell the trees and paint the stump with the relevant herbicides.

Control methods

METHOD	DESCRIPTION
MECHANICAL METHOD	
Hand pulling/ hoeing	<ul style="list-style-type: none"> Hand pulling is most effective with small (30cm), immature or shallow rooted plants. 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 eliminate the spread of seed while shaking.
Chopping/ cutting/ slashing	<ul style="list-style-type: none"> This method is most effective for plants in the immature stage, or for plants that have relatively woody stems/ trunks. This is an effective method for non-re-sprouters or in the case of re-sprouts (coppicing) it must be done in conjunction with chemical treatment of the cut stumps. <p>Note</p> <ul style="list-style-type: none"> Cut/slash the stem of the plant as near as possible to ground level. Paint re-sprouting plants (i.e. Black Wattle, Lantana and Port Jackson willow) with an appropriate herbicide immediately after they have been cut. Stockpile removed material into piles as prescribed.
Felling	<ul style="list-style-type: none"> De-branch trees and where possible remove all material. Where possible large trees that are to be felled such that they fall uphill. Cut the tree down as low as possible to the ground. Apply herbicide immediately (no later than 30mins) to the cambium layer. Ensure all the cuts in the cambium layer are treated.
Ring barking	<ul style="list-style-type: none"> Remove bark in a 30-40cm centimetre band and leave the tree to die Can be used with or without chemicals but is more successful when herbicide is used

APPENDIX 1 – EAP CV's

APPENDIX 2 – LOCALITY MAP

APPENDIX 3 – WATER USE LICENSE

APPENDIX 4 – WATERCOURSE CROSSINGS REPORT

APPENDIX 5 – EMPR ACKNOWLEDGEMENT FORM**Proposed upgrading of the gravel District Roads D1841, D1842 and D1884 from Ndumo to EKuhlehleni, Jozini Local Municipality, KwaZulu-Natal.**

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 management, mitigation and rehabilitation measures for the project outlined above, and the environmental conditions contained in the civil and other construction contract documents.

PROPONENT:

Signed:

Date:

IMPLEMENTING AGENT:

Signed:

Date:

CONTRACTOR:

Signed:

Date:

EMPLOYER'S REPRESENTATIVE (ER):

Signed:

Date:

SUB - CONTRACTOR:

Signed:

Date: